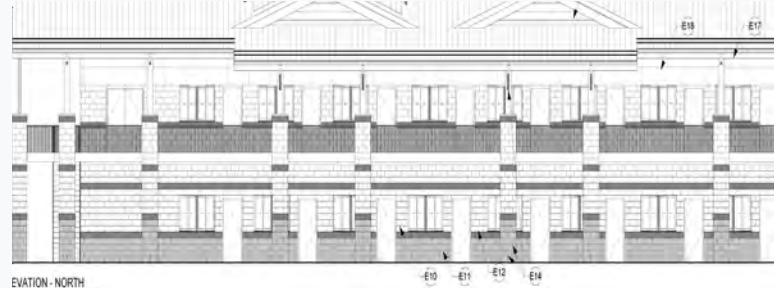


DRAFT - REQUEST FOR PROPOSAL FOR



STATE NO.: 2020-16
NGB PN 100103



MARCH 3, 2023

DESIGN-BUILD CONTRACT SERVICES FOR BETHANY BEACH TRAINING SITE (BBTS) TRANSIENT TRAINING OFFICER QUARTERS /BARRACKS, BETHANY BEACH, DE

ISSUED BY DELAWARE ARMY NATIONAL GUARD



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A.

**PROJECT INTRODUCTION & SUBMISSION
REQUIREMENTS**



TETRA TECH

INTRODUCTION

This Request for Proposal is for a Design-Build contract, for new Transient Training Officers Quarters (Barracks) Facility, for the Delaware Army National Guard (DEARNG), located on their Bethany Beach Training Site (BBTS), in Bethany Beach, Delaware.

DEARNG has engaged Tetra Tech to assist in developing the contents of this RFP Package, which include the following information as presented in the Table of Contents:

Section A - Submission Requirements: Provides the guidance on what materials need to be provided with the Proposal Package, and layout the evaluation process for selection.

Section B - Procurement and Contractual Requirements: Provides direction for the make up of Design-Build team, logistical requirements for the RFP documentation, and Contractual documentation and Requirements.

Section C – General Requirements: This includes References and Scope of Work materials, which includes Conceptual level Bridging Documents, These Bridging Documents include Site plan Drawings Architectural Floor plan(s) and Elevation Drawings (Section C, Statement of Work - Attachment 'K'-separate attachment), along with System Narratives (Section C, "Statement of Work")." The designs provided in these Bridging Documents were developed based on the Congressional authorized project 1390 documentation (including the Architectural program), along with direction, feedback and approvals from DEARNG project and user representatives. It should be understood that these Bridging Documents are reference only. The Design-Build team shall include a Professional Building design team, that will develop the actual design and construction documents for this facility.

The ultimate objective of this solicitation is to obtain a facility in which the Transient Training Officers Quarters (Barracks) are able to effectively implement their Army National Guard support and training missions. These activities require sufficient space with up-to-date furnishings and equipment to support the Units' full-time and Army National Guard personnel.

Tetra Tech shall serve as DEARNG's administrative representative for the Bidding process. All questions shall be forwarded via e-mail to the following addresses:

- DEARNG Project Representative – Marc Orndorff - marc.a.orndorff.civ@army.mil
- Tetra Tech's project representatives:
 - o Michael Berninger - Michael.Berninger@tetrattech.com
 - o Chuck Dobbs - chuck.dobbs@tetrattech.com
 - o Tabi Heath - tabi.heath@tetrattech.com
 - o ler.deng@tetrattech.com

End of Introduction

A.2

Submission Requirements

STATE OF DELAWARE



DELAWARE ARMY NATIONAL GUARD (DEARNG)

DESIGN-BUILD PROJECT

For

**BETHANY BEACH TRAINING SITE
TRANSIENT TRAINING OFFICERS QUARTERS (BBTS OQ)
BETHANY BEACH, DELAWARE**

DEARNG PROJECT NO. 2020-16
NGB PN 1000103

REQUEST FOR PROPOSAL

A.2 - SUBMISSION REQUIREMENTS

DESIGN-BUILD SUBMISSION REQUIREMENTS

The following outlines the required Proposal Submission documentation contents, and the related evaluation Factors.

1. VOLUME 1— FACTOR 1 — DESIGN TECHNICAL
 - 1.1.1. GENERAL
 - 1.1.2. VOLUME 1-TAB A — SUBFACTOR 1— BUILDING FUNCTIONAL, AESTHETICS AND SPACE
 - 1.1.3. VOLUME 1-TAB B — SUBFACTOR 2 — QUALITY OF BUILDING SYSTEMS AND MATERIALS
 - 1.1.4. VOLUME 1 TAB C - SUBFACTOR 3 — SITE DESIGN
 - 1.1.5. VOLUME 1 TAB D — SUBFACTOR 4 - SUSTAINABILITY REQUIREMENTS
2. VOLUME -2 FACTOR 2 —REMAINING PERFORMANCE CAPABILITY PROPOSAL
 - 2.1.1. VOLUME 2 - TAB A— SUBFACTOR 1— PROPOSED CONTRACT DURATION AND SUMMARY SCHEDULE
 - 2.1.2. VOLUME 2 - TAB B— SUBFACTOR 2— KEY SUBCONTRACTORS
3. VOLUME 3 — PRICE AND PRO FORMA INFORMATION
 - 3.1.1. GENERAL
 - 3.1.2. TAB A — FACTOR 3 — PRICE BID FORM
 - 3.1.3. TAB B — BID GUARANTEE
 - 3.1.4. TAB C — REQUIRED PRE-AWARD INFORMATION
4. PHASE TWO - ATTACHMENTS:
 - FORMAT FOR TABLE OF SPACES

1.0 PROPOSAL CONTENTS AND RELATED EVALUATION FACTORS, SUBFACTORS AND ELEMENTS AND SUBFACTORS

(VOLUME 1 - DESIGN TECHNICAL)

Factor/Sub Factor	Location	Description	Relative Importance
FACTOR 1		DESIGN TECHNICAL	Per RFP 4.5.1
Subfactor 1	Vol. 1 TAB A	Building Functional and Aesthetics	Per RFP 4.5.1
Subfactor 2	Vol. 1 TAB B	Quality of Building Systems and Materials	Per RFP 4.5.1
Subfactor 3	Vol. 1 TAB C	Site Design	Per RFP 4.5.1
Subfactor 4	Vol. 2 TAB D	Sustainability	Per RFP 4.5.1

(VOLUME 2 - REMAINING PERFORMANCE CAPABILITY)

Factor/Sub Factor	Location	Description	Relative Importance
FACTOR 2		REMAINING PERFORMANCE CAPABILITY	Per RFP 4.5.1
Subfactor 1	Vol. 2 TAB A	Proposed Contract Duration and Summary Schedule	Per RFP 4.5.1
Subfactor 2	Vol. 2 TAB B	Key Subcontractors	Per RFP 4.5.1

(VOLUME 3 — PRICE AND PRO FORMA INFORMATION)

Factor/Sub Factor	Location	Description	Relative Importance
FACTOR 3	Vol. 3 TAB A	Price Bid Form and Proposal	Per RFP 4.6
N/A	Vol. 3 TAB B	Bid Bond	Pass/Fail
N/A	Vol. 3 TAB C	Required Pre-Award Information	Pass/Fail

2.0 VOLUME 1— FACTOR 1 — DESIGN- TECHNICAL

2.1. GENERAL: The design-technical Factor consists of conceptual level presentation drawings, technical approach narratives and information regarding material and system quality. It must clearly define the proposed scope and quality levels that the design-build team is offering to the Government in enough detail for the Government and the Offeror to mutually understand whether or not the proposal meets or exceeds the minimum RFP requirements. Fully developed drawings, details, or specifications are not desired or required. The Offeror shall identify what it considers to be Betterments in its proposal. Note that the Government will not evaluate any material that exceeds the page limits, where indicated below.

2.2. VOLUME 1 - TAB A —SUBFACTOR 1 - BUILDING FUNCTIONAL, AESTHETICS AND SPACE

2.2.1. Submission Requirements:

2.2.1.1. Presentation Drawings:

- (a) Presentation Exterior Elevation(s) of the primary elevation(s) of the facility clearly noting proposed materials and colors.
- (b) Typical building or wall section(s) with appropriate details for each building type to depict proposed story height.
- (c) Schematic floor plans for the facility.
- (d) Provide a chart identifying primary interior and exterior finish materials. (This may be in board or binder format)
- (e) 2.2.1.2. Technical Approach Narratives

Provide technical approach narratives, both qualitative and quantitative, defining the elements of the proposal. Preface the narratives with a design concepts narrative, providing the design rationale and basis of the proposal.

- (a) Minimum Space and Facility Size. Describe the spaces provided for each facility, in accordance with the Statement of Work. As a minimum, include a tabulation of the net square footage for rooms, zones, or other areas, the total gross square footage for the facility, and the total gross square footage to clearly demonstrate compliance with the project requirements. See the sample spreadsheet at the end of this section Attachments 1.
- (b) Architectural Theme and Materials. This narrative shall be no longer than three (3) typewritten pages. Describe the architectural themes of the various facilities and spaces which demonstrate how the proposal achieves the results desired by the Statement of Work. Narrative should address how the selection of materials and colors enhances the exterior and interior aesthetics of the facilities and improves the living and/or working conditions for the soldier populations who will utilize the facilities. This narrative is not intended to be a material listing, but to explain/reflect how the selections were made and how they address the requirements.

2.2.2. Evaluation Criteria:

The following elements are rated in importance as outlined in Section 4.5 of the RFP.

2.2.2.1. Building Functional Arrangement: This element considers the overall functional layout (Floor Plan) and interaction of the spaces in the facilities as well. This element considers the planning and design of the spaces with respect to working conditions and the operations of the facility.

The following criteria will be considered in the evaluation of the functional arrangement of the various facilities:

- (a) How well the floor plan responds to the Functional Relationship requirements described in the Statement of Work and RFP Drawings
- (b) How well the floor plan and space arrangement facilitate work flow and access necessary to successfully operate this facility in accordance with its mission.
- (c) Do the facilities provide acceptable life safety and fire safety measures?
- (d) Do the proposed plans demonstrate compliance with the mandatory requirements for circulation, furnishings, equipment, and other specifically identified items in the Statement of Work?

2.2.2.2. Building Aesthetics: This element considers the overall "appeal" of the facility and the desire that both the interior and exterior of the facility present a professional, attractive appearance. The following two areas will be considered under this element and are equal in consideration (not separately rated):

(a) Exterior Considerations:

To the extent possible within the government identified contract cost limitation (CCL), the proposal must comply with the look and feel of the site architectural theme. The first priority in order of importance is how well the proposal provides comparable building mass, size, height, and configuration in comparison with the architectural theme expressed in the RFP. The second priority in order of importance is how well the proposal provides compatible exterior skin appearance based upon facade, architectural character (period or style), exterior detailing, matching the architectural theme expressed in the RFP.

- Proposals shall be evaluated on mass, size, height, and configuration in comparison with the architectural theme expressed in the RFP, design of facades, roof lines, and delineation of entrances, proportions of fenestration in relation to elevations, shade and shadow effects, materials, textures, architectural character (period or style), exterior color schemes.
- How compatible is the proposed design with the site architectural theme expressed in the **RFP**? If not an exact "copy" of the theme, how well does it harmonize or blend with the expressed theme?
- How well does the proposal provide comparable building mass, size, height, and configuration in comparison with the architectural theme expressed in the RFP?
- How well does the proposal provide compatible exterior skin appearance based upon facade, architectural character (period or style), exterior detailing, matching the architectural theme expressed in the RFP?
- Is the buildings' scale and proportion complimentary of the adjacent structures?

- Is the building an attractive addition to the Installation?
- How well does the building harmonize with its environment, including surrounding facilities?
- Has the proposer addressed/coordinated the arrangement of stacks, louvers, vents, and roof mounted equipment, etc. to provide a visually attractive structure?

(b) Interior Considerations:

- Are the proposed colors and material finishes conducive to the working environment of the facility?
- For administrative areas, does the interior design provided establish a positive working environment?
- Has the proposal addressed/provided for natural and artificial light in the working spaces and is the arrangement of fenestration and lighting fixtures in the spaces conducive to furniture placement and space usage?
- Do the proposed ceiling materials, elevation, and design enhance the environment'?
- Has "support item" placement been considered and addressed in the proposal to enhance the environment? For example: placement of supply/exhaust devices, placement of electrical panels, placement of exhaust fans, etc.
- Does the proposal provide for acoustic control of noise from service/support spaces to administrative areas?

2.2.2.3. Minimum Space and Facility Size

The proposal must include all the mandatory spaces in response to the requirements set forth in the Statement of Work. For this element, proposals will be evaluated on compliance with these requirements. Proposals shall identify any individual area which are less than the required areas and describe how such deviation would enhance the building function. Individual areas may slightly exceed the requirements, so long as building function is not compromised elsewhere and as long as the overall square footage is not greater than 16,166 GSF, including canopies greater than 3' counted at 50%, as authorized by Congress.

2.3.VOLUME 1- TAB B — SUBFACTOR 2 - QUALITY OF BUILDING SYSTEMS AND MATERIALS

2.3.1. General subfactor, the Government has identified items as desirable features or preferable items in the Statement of Work. The Government desires the use of Johnson controls Metasys for the Building Automation System. These items, along with any Offeror-identified betterment, will be given additional consideration during the evaluation process, provided that they are included within the contract cost limitation (CCL) identified in the RFP.

2.3.1.1. Presentation Drawings

(a) There are no specific drawings requirements for this Subfactor. However, the Offeror has the option of providing concept level drawing information for specific materials and/or systems which the Offeror feels are necessary to describe the proposed systems or materials.

2.3.1.2. Technical Approach Narratives:

Provide technical approach narratives, both qualitative and quantitative, defining the elements of the proposal. It is acceptable to include all the sub-items shown below into a single combined narrative for the entire facility. It is the responsibility of the proposer to ensure that all aspects identified in the evaluation criteria below are addressed. Whether individual narratives or a single combined narrative is provided, the maximum total length for narratives shall be ten (10) typewritten pages.

- (a) Architectural Finishes: Describe how the materials selected provide for a suitable environment for the expected population of the facility. Discuss how these selections provide value to the Government and how they address the minimum requirements of the RFP. Narrative should focus on durability and maintenance of the finishes proposed.
- (b) Furniture Systems: Not Used
- (c) Mechanical Systems: Describe how the mechanical systems selected provide for a highly efficient environmental control system including information about provisions for indoor air quality maintenance. Discuss how these selections provide value to the Government and how they address the minimum requirements of the RFP. Narrative should focus on maintenance considerations, limiting energy consumption, and suitability of the proposed systems for the expected usage.
- (d) Plumbing Systems: Describe how the plumbing systems selected provide for a highly efficient domestic hot water system and an efficient piping system. Discuss how these selections provide value to the Government and how they address the minimum requirements of the RFP. Narrative should focus on maintenance considerations, energy consumption, and suitability of the proposed systems for the *expected* usage.
- (e) Electrical Systems: Describe how the electrical power and lighting systems, telephone, data, and cable television systems selected provide for a highly efficient electrical system. Discuss how these selections provide value to the Government and how they address the minimum requirements of the RFP. Narrative should focus on maintenance considerations, energy consumption, and suitability of the proposed systems for the expected usage.
- (f) ATFP Considerations: Describe how the proposed materials, systems, and designs address the mandatory building ATFP requirements included in the Statement of Work.
- (g) Site Utilities and Site Systems:
- (h) Interoperability: Describe how systems integrated into the new facilities which require connection and interface with existing installation-wide systems will be accommodated in the proposed project. Narrative should address the following systems as minimum: Fire Alarm, Telephone, Cable Television, UMCS, and privatized utility companies where applicable.
- (i) Solar Hot Water Heating: Include provisions to provide at least 30% of the domestic hot water requirements through solar heating methodologies, unless the results of a Life Cycle Cost Analysis (LCCA), developed utilizing the Building Life Cycle Cost Program (BLCC) or the Life Cycle Cost in Design (LCCID) Program, demonstrates to the Government's satisfaction that the solar hot water system is not life cycle cost effective in comparison with other hot water heating systems.

Discuss and outline Offeror's strategy for this solar system including components, placement of collectors, and controls. Include all applicable input data, assumptions, first cost, replacement cost, and maintenance and repair cost that were utilized in the calculations. If using the LCCA to justify non-selection of solar hot water heating, make all life cycle cost comparisons to a baseline system to provide domestic hot water without solar components. Analyze at least two different solar hot water methodologies to compare against the baseline system. Use a study period of 25 years.

2.3.1.1 Proposed Material Identifications: In order to evaluate and rate the quality of the materials being proposed, including any material or equipment warranties exceeding the one year warranty in the contract clause "Warranty of Construction", the Offeror shall include in the proposal material identification for major materials in each of the areas shown below. Provide this information tabular form supported, if necessary to clearly identify level of proposed quality, by catalog information (may provide on CD-ROM). Table should include manufacturer's name, model number, length of warranty, size/capacity (where available), efficiency (where applicable), and any other notes or information selected by the Offeror. The Government will evaluate and consider materials and equipment proposed by brand name and model number as a quality standard. Unless substitution of a manufacturer, brand name or model is otherwise specifically prohibited in the contract, if the successful Offeror desires to substitute manufacturers, brand names or models after award, the substituted product must meet the contract requirements and be approved by the designer of record and the Government as equal in function, performance, quality and salient features to that initially proposed. Acceptance of the proposal is not a guaranty that the proposed products meet the contractual requirements.

(a) Architectural Finishes

- Interior Walls
- Floors
- Ceilings
- Exterior Walls
- Any Special Features
- Hardware systems (not individual hardware sets)
- Door systems/types (not individual doors)
- Window systems/types (not individual windows)
- Roofing Systems

(b) Furniture Systems: Not Used

(c) Mechanical Systems

- Central Heating/Cooling Equipment
- Pumps
- Air Handling Equipment
- HVAC System Control Equipment
- Energy Conservation Features

(d) Plumbing Systems

- Fixtures
- Domestic Hot Water Generator

(e) Electrical Systems

- Lighting Fixtures
- Main Switchgear and Panels
- Data, Telephone, Cable TV, Intercom, CCTV, or Other Special Systems as Identified in the SOW 5.3,1.4_

Provide a list of quality improvements that are above the minimum stated with the performance specifications.

Develop the following table, or similar, to identify quality betterments.

	Improved Quality	Concise description of improved quality	Feature is included within the Contract Cost Limitation (YES/NO)
Arch. Finishes	N/A	N/A	
Etc.			

2.3.2. Evaluation Criteria:

2.3.2.1. General: It is the DEARNG’s objective that these buildings will have a 25-year useful design life before a possible reuse/repurpose or renovation requirement, to include normal sustainment, restoration, modernization activities and a 50-year building replacement life. Within that overriding theme the Government will evaluate the Offeror selected systems and components proposed in terms of warranties provided, maintenance considerations (frequency, estimated cost, access, equipment locations), operability (ease of use, placement of control features, simplicity), durability (withstand troop usage, ease of cleaning), sustainability, and energy consumption (HVAC, lighting, power). The minimum acceptable level of quality for finishes and materials for these buildings are those materials suitable for the expected population and usage. Residential or similar grade finishes and materials are not acceptable for inclusion in these buildings, unless otherwise specifically allowed in the Statement of Work.

2.3.2.2. The Government encourages the Offeror to place emphasis on those design features which optimize and emphasize functional/operational requirements; interior/exterior finishes and systems; and life cycle/ energy efficiency. The Offeror may choose the lowest "Type of Construction" allowed by the Building Code for this occupancy/project which meets ATFP and Army National Guard Design Guide requirements and put the money into durable finishes and efficient systems. Offeror-identified betterments may also be given additional consideration during the evaluation process, provided that they are included within the contract cost limitation identified in the RFP. The order of importance for proposed betterments for rating purposes is as follows: desirable features, preferable items and other Offeror identified betterments. Unsubstantiated claims or narrative information will not be given evaluation credit during the evaluations. The following elements (not rated separately) will be considered in the evaluation of the building systems and materials of the various facilities:

(a) Architectural Finishes, Components and Systems:

Satisfactory proposals include finishes, components and systems which provide usable spaces for the intended purposes and that provide the basic function necessary. Proposals will receive additional consideration for materials, and systems offered that include extended warranties, longer life expectancies, sustainability, durability (stand up to troop usage), have low maintenance requirements, and enhance the overall life cycle cost efficiency of the facility.

Specific examples of desirable features: solid wood cabinetry; solid surface counter tops; ceramic tile; 25 year non-pro-rated, no-leak roof warranty; high efficiency windows and doors.

(b) Furniture Systems: Not Used

(c) Mechanical Components and Systems:

Satisfactory proposals include components and systems that provide the basic environmental control function necessary. Proposals will receive additional consideration for components and systems offered that include extended warranties, longer life expectancies, reduce energy consumption, sustainability, maintainability (cyclical maintenance, access, equipment placement), and enhance the overall life cycle cost efficiency of the facility.

Specific examples of desirable features: sheet metal ductwork systems; high efficiency central equipment (i.e. 0.5 kW/ton chillers, variable speed pumping and air handlers, etc.)

(d) Plumbing Components and Systems:

Satisfactory proposals include components and systems that provide the basic function necessary. Proposals will receive additional consideration for components and systems offered that include extended warranties, longer life expectancies, sustainability, durability (stand up to troop usage), have low maintenance requirements, and enhance the overall life cycle cost efficiency of the facility.

Specific examples of desirable features: lifetime domestic hot water storage tank warranty; high efficiency equipment; easy/local availability of replacement/repair parts; zoned/valved sub-systems to allow repair without building shutdown; shower heads on hoses.

(e) Electrical Components and Systems:

Satisfactory proposals include components and systems that provide the basic function necessary. Proposals will receive additional consideration for components and systems offered that include extended warranties, longer life expectancies, sustainability, durability (stand up to troop usage), have low maintenance requirements, and enhance the overall life cycle cost efficiency of the facility.

Specific examples of desirable features: all copper conductors; additional telephone/data/cable TV outlets.

ATFP Considerations: This consideration verifies the inclusion/compliance with the building related (laminated windows, design for progressive collapse, etc.) ATFP minimum standard constraints included in the Statement of Work. All proposals must be compliant with the ATFP requirements of the Statement of Work to be considered for award. Satisfactory proposals are compliant with all ATFP requirements.

(g) Site Utilities Components and Site Systems:

(h) Interoperability: Fire Alarm, Telephone, Cable Television, UMCS, and privatized utility systems (where applicable) must be integrated into the new facilities which require connection and interface with existing installation-wide systems must be accommodated in the proposed project.

(i) Solar Hot Water Heating: The Government will evaluate the systems and materials proposed for use in the solar domestic hot water system. Proposals that demonstrate solar hot water provisions above 30% will receive additional

consideration during the evaluation, provided that it does not increase first cost beyond the contract cost limitation (CCL). No additional consideration will be given for proposals providing for more than 30% solar hot water if the proposed price exceeds the CCL. If the Offeror has provided life cycle cost analyses documenting the non-feasibility of the solar system provision, the Government will verify as reasonable and complete. Errors or inconsistencies in the calculations will be considered deficiencies during evaluations.

2.4. VOLUME 1 - TAB C — SUBFACTOR 3 — SITE DESIGN

2.4.1 Submission Requirements:

2.4.1.1. Presentation Drawings:

(a) Conceptual Site Plans showing improvements for grading, drainage, power, utilities, buildings, paving, walks, site lighting, and landscaping. Indicate all building setbacks and separations, which must meet antiterrorism design requirements.

(b) Schematic site/land-use plan showing facility placement and orientation, vehicular circulation, pedestrian circulation, and other site improvements. This plan should demonstrate soldier/occupant considerations in the site design and the advantages included in the proposal with respect to pedestrian and vehicle circulation within the site and integration into the surrounding community.

2.4.1.2. Technical Approach Narrative:

Provide technical approach narrative, both qualitative and quantitative, defining the elements of the proposal. Preface the narratives with a design concepts narrative, providing the design rationale and basis of the proposal. It is acceptable to include all the sub-items shown below into a single combined narrative for the entire project. It is the responsibility of the Offeror to ensure that all aspects identified in the evaluation criteria below are addressed. Whether individual narratives or a single combined narrative is provided, the maximum total length for narratives shall be five (5) typewritten pages.

(a) Grading

- Cut/Fill Considerations
- Positive Drainage

(b) Landscaping

- Plant Material Selection
- Other Feature Selection

(c) Vehicle Circulation

- Development of Circulation Patterns

- Parking Locations and Quantities
- Interface with Existing Street/Roadway Systems

(e) Anti-Terrorism/Force Protection

- Compliance with the Statement of Work Requirements.

2.4.2. Evaluation Criteria:

2.4.2.1. This Subfactor considers the overall layout of the site and the various specialties which define a workable, pleasing environment for the soldiers. The proposed site development plan must incorporate all the specific requirements from the Statement of Work as well as comply with all statutory and regulatory requirements outlined therein. All site related Anti-Terrorism/Force Protection (ATFP) considerations must be included and/or addressed in the proposal.

(1) Grading and Landscaping: Satisfactory proposals include reasonable amounts of cut/fill and regarding as necessary to ensure proper drainage and positive drainage away from facilities and parking areas. Landscaping provided would be the minimums required by the Statement of Work. Proposals which include innovative solutions to storm water management, landscaping to enhance the complex environment, or other similar improvements beyond the basic requirements will receive additional consideration during the proposal evaluation process.

(2) Vehicle Circulation and Storage: Satisfactory proposals address and include all the specific requirements of the Statement of Work.

The following items will be considered with respect to pedestrian and vehicle circulation and storage. These are not sub-factors.

Vehicle Considerations:

- Are the vehicle entrance/exit ways pathways clear?
- Have a sufficient number of parking spaces for privately owned vehicles (POV) been provided?
- Do the new vehicle roadways and access points tie into the existing roadway network in an efficient manner?
- Does the proposal provide for a separation of parking area entrance/exits from street intersections?
- Internal circulation patterns within the parking areas.

(3) ATFP Considerations: This element verifies the inclusion/compliance with the site related (setbacks, etc.) ATFP constraints included in the Statement of Work. All proposals must be compliant with the ATFP requirements of the Statement of Work to be considered for award. Satisfactory proposals are compliant with all ATFP requirements. This is a mandatory requirement to be rated as acceptable. Acceptance of the successful proposal does not constitute acceptance of design that does not conform to ATFP requirements.

2.5. VOLUME 1 - TAB D — SUBFACTOR 4 — SUSTAINABILITY REQUIREMENTS

2.5.1 Submission Requirements:

The Offeror shall acknowledge that it understands the contract requirements for sustainable design and construction and that the final project will achieve a LEED Silver rating. The Offeror shall submit LEED NC 2009 Project Checklist demonstrating how it will achieve the Silver LEED rating. If the Offeror proposes a higher LEED rating than silver, the proposal shall describe whether or not it involves additional costs and clearly indicate if such costs would detract from higher rated factors herein, such as functionality, quality of materials and systems, site work, etc.

2.5.2. Evaluation Criteria:

All requirements identified as mandatory in Statement of Work or elsewhere in the RFP must be included and the proposal must meet the requirements of the LEED NC 2009 requirements for a Silver rating. The Government will provide additional evaluation consideration for proposals which include LEED points identified as preferred. The Government does not desire to pay more to obtain a higher LEED rating, such as Gold, if the additional cost would detract from the higher rated factors, herein.

3.0 VOLUME 2 - FACTOR 2 — REMAINING PERFORMANCE CAPABILITY PROPOSAL

3.1. VOLUME 2 - TAB A — SUBFACTOR 1 — PROPOSED CONTRACT DURATION AND SUMMARY SCHEDULE

3.1.1. Submission Requirements:

3.1.1.1. Proposed Contract Duration: The Offeror shall propose the contract duration in the appropriate Schedule, not to exceed the maximum contract duration specified in the CLIN.

3.1.1.2. Summary Schedule: Submit a summary level schedule for integrated design and construction. Schedules or diagrams may be provided separately in a size that is easily read, but shall be bound and clearly labeled as Tab B. This summary schedule will, after contract award, be replaced with a project schedule as required by Section 01 32 01.00 10: Project Schedule. The summary schedule shall be task oriented, indicating the number of calendar days, after notice to proceed, by which milestones are to be achieved. Offeror may use a critical path or other method of his choice; however, schedules shall be graphically represented. The proposed project schedule shall reflect the proposed contract duration. Give attention to the following features:

- (a) Provide a narrative, describing the design packaging plan for separate design packages, based on the Offeror's plan for fast tracking. Describe all design and construction to be "fast-tracked" (See Section 01 03 00 00 48: Design After Award). If long lead item equipment must be ordered prior to completion of a design phase, describe the requirement in the narrative and show the required ordering date in the schedule.
- (b) Show the design phase, including events associated with coordinating the interim and final design submittals for each package and the proper handling of the review comments for each design package.

(c) Show the overall construction phase for each facility, for the site work, and for utilities. Show fast track starts for design packages but it isn't necessary to show the detailed breakdown construction (e.g., by trades) of each facility, site work and utilities.

(d) Show turnover of each facility. Identify any proposed phased turnovers. The time to complete the facility and turnover to the Government must consider the requirement for the Contractor's CQC completion inspection and the subsequent joint Contractor-Government turnover inspection.

(e) Show as-built submissions.

(f) Constraints: Offeror must demonstrate the capability and flexibility to plan and schedule the complete project to meet the proposed contract completion period. Clearly identify any constraints on the schedules presented (e.g., labor or material availability, permits, weather, etc.). Indicate the anticipated overall critical path on the schedule.

3.1.2. Evaluation Criteria:

3.1.2.1. Proposed Contract Duration: This duration will become the contractually binding completion period. The Government will evaluate the contract duration, as proposed by the Offeror in the Schedule. In assessing the reasonableness of the proposed contract duration, the Government may take into account how well the proposed summary schedule supports the proposed duration, as well as use other information, such as but not limited to independent judgment concerning logic, constraints and typical construction durations. The Government will rate a proposed contract duration matching the maximum allowed contract duration as "satisfactory" A proposed contract duration shorter than the maximum allowed duration will receive additional rating consideration, provided it is realistic and deemed to be achievable. The Government will consider an unreasonably condensed contract duration, which places additional cost or schedule risk on the Government or which may create a risk of contract or performance failure, as a significant weakness or a deficiency, depending upon the evaluators' judgment. During the subsequent comparison between proposals, differences between proposed contract durations of at least three weeks (differences of 21 calendar days between proposals) will be considered an advantage to the Government, with greater differences also considered, accordingly. No advantage will be considered between proposals for differences less than 21 calendar days.

3.1.2.2. Summary Schedule: The Government will evaluate the summary schedule for integrated design and construction. The length of the schedule must match the Offeror's proposed contract duration. Therefore, the Government believes that there is no valid need to shorten the schedule less than the full proposed contract duration. The Government will evaluate the schedule to assess the strength of understanding of the project scope, restrictions which must be considered in the schedule e.g., permitting, long lead items, etc. The Government will evaluate the strength of understanding of events associated with coordinating design submittals, reviews and incorporating review comments, the Offeror's capability to schedule the complete project within the proposed contract duration and the realism of the schedule. The Government will evaluate the design phasing plan for logic, reasonableness, how it facilitates meeting the proposed contract duration and how it facilitates the Government's ability to timely perform its design reviews. A schedule that offers advantage(s) to the Government over one that

merely indicates an adequate understanding of the scope, restrictions, major milestones and general understanding of the various events that can affect start and completion of construction will receive additional consideration.

3.2.VOLUME 2 - TAB B— SUBFACTOR 2— KEY SUBCONTRACTORS

3.2.1. Submission Requirements:

Identify the Key Subcontractors chosen for areas listed in section 4.4.2 of the RFP, describing the extent of their involvement in the project. Submit no more than five (5) Submitter Experience and Past Performance forms for each Key Subcontractor, using the same requirements as described in the RFQ Submitter Experience submission requirements, including past performance ratings or references. Information shall be for projects completed within the past 5 years. The ratings may be from either the owner or the prime contractor, if the firms were subcontractors on the cited projects. The Offeror shall document unequivocal teaming arrangements with its key subcontractors.

3.2.2. Evaluation Criteria:

3.2.2.1. This Subfactor is composed of two equal elements (not separately rated): Specialized Experience and Past Performance.

3.2.2.2. The Government will evaluate the specialized experience and past performance of the Key Subcontractors for electrical and mechanical installation, using the same criteria as in the Phase 1 evaluation, as applicable to their role on this project. No substitution will be allowed without adequate reason and possible consideration to the Government.

4.0 VOLUME 3 — PRICE AND PRO FORMA INFORMATION

4.1. GENERAL

Submit the Pro Forma information in a separate envelope labeled: "Phase 2, Volume 3 — Pro Forma Requirements."

4.2. TAB A — FACTOR 3 — PRICE (Bid Form and Schedule). 7.2.L Submission Requirements:

4.2.1.1. Submit the properly filled out and executed Bid Forms, containing proposed line item and total pricing, as well as the proposed contract duration.

4.2.1.2. Supplemental Price Breakdown. If deemed necessary to evaluate the price proposals, the Government's will request a Phase 2 price breakdown of the Contract Line items in a sealed envelope marked "Phase 2 Price Breakdown Information", in Excel format. The Government will provide details on where and how to send the breakdown. This information will not be needed sooner than three working days after the proposal submission due date. This information may be required for the initial Phase 2 proposal and, if requested, for any revised proposals. This information is not an opportunity for an Offeror to revise its non-price or price proposal.

4.2.2. Evaluation Criteria:

4.2.2.1 Price will not be rated or scored in accordance with the RFP. The price evaluators will also check for appearance of unbalanced line item prices. Offerors are cautioned to distribute direct costs, such as material, labor, equipment, subcontracts, etc. and to evenly distribute indirect costs, such as job overhead, home office overhead, bond, etc., to the appropriate contract line items. Both parties shall presume that field overhead costs through the proposed contract duration are inclusive in the offered price for the contract.

4.2.2.2. If deemed necessary, the supplemental price breakdown information will be used to assist the Government in performing the price evaluations described above.

4.2.2.1 Award cannot be made for project cost for design and construction exceeding the cost limitation described herein.

B. DIVISION 00

PROCUREMENT AND CONTRACTING REQUIREMENTS



TETRA TECH

SECTION 00 21 13

INSTRUCTIONS TO DESIGN-BUILDERS

(These Instructions to Design-Builders have been modified to conform to the methodology of Design-Build project delivery.)

TABLE OF ARTICLES

1. DEFINITIONS
2. DESIGN-BUILDER'S REPRESENTATION
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4. RFP PROCEDURES
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7. PERFORMANCE BOND AND PAYMENT BOND
8. FORM OF AGREEMENT BETWEEN OWNER AND DESIGN-BUILDER

ARTICLE 1: GENERAL

- 1.1 DEFINITIONS - Whenever the following terms are used, their intent and meaning shall be interpreted as follows:
- 1.2 DEARNG = Delaware Army National Guard = Contracting Agency
- 1.3 BBTS TTOQ = Bethany Beach Training Site Transient Training Officers Quarters / Barracks
- 1.4 STATE: The State of Delaware.
- 1.5 AGENCY: Contracting State Agency as noted above 1.2 and on cover sheet.
- 1.6 DO = DESIGNATED OFFICIAL: The agent authorized to act for the Agency.
- 1.7 ODPa = OWNER’S DESIGN PROFESSIONAL ADVISOR = TETRA TECH
- 1.8 DESIGN-BUILD DOCUMENTS: Design-Build Documents include the Request For Proposals, the Submission Requirements and the proposed Design-Build Documents. The Submission Requirements consist of the Instructions to Design-Builders, Supplementary Instructions to Design-Builders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the RFP Form (including the Non-collusion Statement), and other sample RFP and contract forms. The proposed Design-Build Documents consist of the form of Agreement between the Owner and Design-Builder, as well as the Drawings, Specifications (Div 0 & Div 1) and all Addenda issued prior to execution of the Contract.
- 1.9 DESIGN-BUILD DOCUMENTS: The Design-Build Documents consist of the, Instructions to Design-Builders, Supplementary Instructions to Design-Builders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Owner and the Design-Builder, Drawings (if any), Specifications (Project Manual), and all addenda.
- 1.10 AGREEMENT: The form of the Agreement shall be AIA Document A141-2014, Standard Form of Agreement between Owner and Design-Builder, Exhibit A and Exhibit B. In the case of conflict between the instructions contained therein and the General Requirements herein, these General Requirements shall prevail.
- 1.11 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Design-Build Documents and to contracts in general. They contain, in summary, requirements of laws of the State; policies of the Agency and instructions to Design-Builders.

- 1.12 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the Design-Build documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.
- 1.13 ADDENDA: Written or graphic instruments issued by the Owner/Consultant prior to the execution of the contract which modify or interpret the Design-Build Documents by additions, deletions, clarifications or corrections.
- 1.14 DESIGN-BUILDER: A person or entity who submits a formal response to the Request For Proposals for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Design-Build Documents.
- 1.15 SUB-DESIGN-BUILDER: A person or entity who submits a RFP to a Design-Builder for materials or labor, or both for a portion of the Work.
- 1.16 REQUEST FOR PROPOSALS: A complete and properly executed consisting of the Technical Proposal and the Price Proposal to do the Work for the sums stipulated therein, submitted in accordance with the Design-Build Documents.
- 1.17 BASE RFP: The sum stated in the Price Proposal of the RFP for which the Design-Builder offers to perform the Work described in the Design-Build Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate RFPs (if any are required to be stated in the RFP).
- 1.18 ALTERNATE RFP (or ALTERNATE): An amount stated in the Price Proposal of the RFP, where applicable, to be added to or deducted from the amount of the Base RFP if the corresponding change in the Work, as described in the Design-Build Documents is accepted.
- 1.19 UNIT PRICE: An amount stated in the Price Proposal of the RFP, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Design-Build Documents.
- 1.20 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Design-Builder's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.
- 1.21 DESIGN-BUILDER'S DEPOSIT: The security designated in the RFP to be furnished by the Design-Builder as a guaranty of good faith to enter into a contract with the Agency if the Work to be performed or the material or equipment to be furnished is awarded to him.
- 1.22 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.
- 1.23 DESIGN-BUILDER: Any individual, firm or corporation with whom a contract is made by the Agency.
- 1.24 SUBDESIGN-BUILDER: An individual, partnership or corporation which has a direct contract with a Design-Builder to furnish labor and materials at the job site, or to perform

construction labor and furnish material in connection with such labor at the job site, or to perform design or consulting services normally provided by a professional services firm such as an Architectural or engineering firm.

- 1.25 CONTRACT BOND: The approved form of security furnished by the Design-Builder and his surety as a guaranty of good faith on the part of the Design-Builder to execute the work in accordance with the terms of the contract.

ARTICLE 2: DESIGN-BUILDER’S REPRESENTATIONS

2.1 PRE-RFP MEETING

- 2.1.1 A pre-RFP meeting for this project will be held.

2.2 By submitting an RFP, the Design-Builder represents that:

- 2.2.1 The Design-Builder has read and understands the Design-Build Documents and that the RFP is made in accordance therewith.

- 2.2.2 The Design-Builder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Design-Builder’s personal observations with the requirements of the proposed Design-Build Documents.

- 2.2.3 The RFP is based upon the materials, equipment, and systems required by the Design-Build Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

- 2.3.1 Does not apply.

- 2.3.2 Included with the submission of the RFP, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Venturers involved.

- 2.3.3 All required RFP Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.

- 2.3.4 All required insurance certificates shall name both Joint Venturers.

- 2.3.5 Both Joint Venturers shall sign the RFP and shall submit a copy of a valid Delaware Business License with their RFP.

- 2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the RFP.

- 2.3.7 In the event of a mandatory Pre-RFP Meeting, each Joint Venturer shall have a representative in attendance.

- 2.3.8 Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the State.

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

2.4.1 As consideration for the award and execution by the Owner of this contract, the Design-Builder hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this contract.

ARTICLE 3: RFP DOCUMENTS

3.1 COPIES OF RFP DOCUMENTS

3.1.1 Does not apply.

3.1.2 Design-Builders shall use complete sets of Design-Build Documents for preparation of RFPs. The issuing Agency nor the ODPa assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Design-Build Documents.

3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the OWNER and the ODPa immediately.

3.1.4 The OWNER and ODPa may make copies of the Design-Build Documents available on the above terms for the purpose of obtaining RFPs. No license or grant of use is conferred by issuance of copies of the Design-Build Documents.

3.2 INTERPRETATION OR CORRECTION OF RFP DOCUMENTS

3.2.1 The Design-Builder shall carefully study and compare the Design-Build Documents with each other, and with other work being RFP concurrently or presently under construction to the extent that it relates to the Work for which the RFP is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the ODPa.

3.2.2 Design-Builders or Sub-Design-Builders requiring clarification or interpretation of the Design-Build Documents shall make a written request to the ODPa in accordance with procedures and schedule posted in RFP. Interpretations, corrections and changes to the RFP Documents will be made by written Addendum. Interpretations, corrections, or changes to the RFP Documents made in any other manner shall not be binding.

3.2.3 The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specification compliance will be the responsibility of the Design-Builder.

3.2.4 Unless otherwise provided in the Design-Build Documents, the Design-Builder shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

3.2.5 The Owner will bear the costs for all impact and user fees associated with the project.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Design-Build Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Design-Builder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

3.3.2 Requests for substitutions shall be made in writing to the ODPa in accordance with procedures outlined in the RFP. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The ODPa's decision of approval or disapproval shall be final. The ODPa is to notify Owner prior to any approvals.

3.3.3 If the ODPa approves a substitution prior to the receipt of RFPs, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.

3.3.4 The ODPa shall have no obligation to consider any substitutions after the Contract award.

3.4 ADDENDA

3.4.1 Addenda will be mailed or delivered to all selected proposers.

3.4.2 Does not apply.

3.4.3 Does not apply.

3.4.4 Each Design-Builder shall ascertain prior to submitting his RFP that they have received all Addenda issued, and shall acknowledge their receipt in their RFP. Not acknowledging an issued Addenda could be grounds for determining an RFP to be non-responsive.

ARTICLE 4: RFP PROCEDURES

4.1 PREPARATION OF RFPs

4.1.1 Complete the RFPs on the Forms included with the Design-Build Documents.

4.1.2 Submit the original Form for each RFP. Forms may be removed from the Design-Build Documents for this purpose.

4.1.3 Execute all blanks on the Forms in a non-erasable medium (typewriter or manually in ink).

4.1.4 Where so indicated by the makeup on the Form, express sums in both words and figures, in case of discrepancy between the two, the written amount shall govern.

- 4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the RFP.
- 4.1.6 Complete all requested alternates and unit prices, if any. If there is no change in the amount for an Alternate, enter “No Change”. The Design-Builder is responsible for verifying that they have received all addenda issued during the RFP period. Work required by Addenda shall automatically become part of the Contract.
- 4.1.7 Does not apply.
- 4.1.8 Each copy of the RFP shall include the legal name of the Design-Builder and a statement whether the Design-Builder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Design-Builder to a contract. An RFP by a corporation shall further give the state of incorporation and have the corporate seal affixed. An RFP submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Design-Builder.
- 4.1.9 Design-Builder shall complete the Non-Collusion Statement form included with the Design-Build Documents and include it with their RFP.
- 4.1.10 In the construction of all Public Works projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.
- 4.1.11 Each Design-Builder shall include in their RFP a copy of a valid Delaware Business License.’
- 4.1.12 Each Design-Builder shall include signed Affidavit(s) for the Design-Builder and each listed Subcontractor certifying compliance with OMB Regulation 4104- “Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on “Large Public Works Projects.” “Large Public Works” is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.
- 4.2 RFP SECURITY
- 4.2.1 All RFPs shall be accompanied by a deposit of either a good and sufficient bond to the agency for the benefit of the agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the agency, or a security of the Design-Builder assigned to the agency, for a sum equal to at least 10% of the RFP amount plus all add alternates, or in lieu of the RFP bond a security deposit in the form of a certified check, bank treasurer’s check, cashier’s check, money order, or other prior approved secured deposit assigned to the State. The RFP bond need not be for a specific sum, but may be stated to be for a sum equal to 10% of the RFP amount plus all add alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the RFP. The RFP Bond form used shall be the standard OMB form (attached).
- 4.2.2 The Agency has the right to retain the RFP security of Design-Builders to whom an award is being considered until a formal contract has been executed and bonds have been furnished.

4.2.3 In the event of any successful Design-Builder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the RFP bond or security deposited by the successful Design-Builder shall be forfeited.

4.3 SUBCONTRACTOR-BUILDER LIST

4.3.1 As required by the Design-Build Documents, each Design-Builder shall submit with their RFP, a completed List of Subcontractors included with the Design-Build Documents. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. An RFP will be considered non-responsive unless the completed list is included.

4.3.2 Provide the Name and Address for each listed subcontractor. Addresses by City, Town or Locality, plus State, will be acceptable.

4.3.3 It is the responsibility of the Design-Builder to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Design-Builder elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Forms and be able to document their capability to act as Subcontractor in that category in accordance with this law.

4.4 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

4.4.1 During the performance of this contract, the Design-Builder agrees as follows:

A. The Design-Builder will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Design-Builder will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Design-Builder agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

B. The Design-Builder will, in all solicitations or advertisements for employees placed by or on behalf of the Design-Builder, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

4.5 PREVAILING WAGE REQUIREMENT

4.5.1 Wage Provisions: For renovation and new construction projects whose costs exceed the thresholds contained in Delaware Code, Title 29, Section 6960, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.

- 4.5.2 The employer shall pay all mechanics and labors employed directly upon the site of work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.
- 4.5.3 The scale of the wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work.
- 4.5.4 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.
- 4.6 SUBMISSION OF RFPs
- 4.6.1 Enclose the RFP, the RFP Security, and any other documents required to be submitted with the RFP in a sealed opaque envelope. Address the envelope to the party receiving the RFPs. Identify with the project name, project number, and the Design-Builder's name and address. If the RFP is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "RFP ENCLOSED" on the face thereof. The State is not responsible for the opening of RFP prior to RFP opening date and time that are not properly marked.
- 4.6.2 Deposit RFPs at the designated location prior to the time and date for receipt of RFPs indicated in the Design-Build Documents. RFPs received after the time and date for receipt of RFPs may be rejected.
- 4.6.3 Design-Builder assumes full responsibility for timely delivery at location designated for receipt of RFPs.
- 4.6.4 Oral, telephonic or telegraphic RFPs are invalid and will not receive consideration.
- 4.6.5 Withdrawn RFPs may be resubmitted up to the date and time designated for the receipt of RFPs, provided that they are then fully in compliance with these Instructions to Design-Builders.
- 4.7 MODIFICATION OR WITHDRAW OF RFPs
- 4.7.1 Prior to the closing date for receipt of RFPs, a Design-Builder may withdraw an RFP by personal request and by showing proper identification to the ODP. A request for withdraw by letter or fax, if the ODP is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the RFP price will render the RFP informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the RFP price shall not be permitted and will have no bearing on the submitted proposal in any manner.
- 4.7.2 Design-Builders submitting RFPs that are late shall be notified as soon as practicable and the RFP may be returned.
- 4.7.3 A RFP may not be modified, withdrawn or canceled by the Design-Builder during a sixty (60) day period following the time and date designated for the receipt and opening of RFPs,

and Design-Builder so agrees in submitting their RFP. RFPs shall be binding for 60 days after the date of the RFP submission.

ARTICLE 5: CONSIDERATION OF RFPS

5.1 OPENING/REJECTION OF RFPS

5.1.1 Does not apply.

5.1.2 The Agency shall have the right to reject any and all RFPs. A RFP not accompanied by a required Bid Security or by other data required by the Design-Build Documents, or a RFP which is in any way incomplete or irregular is subject to rejection.

5.1.3 If the RFPs are rejected, it will be done within thirty (30) calendar day of the RFP submission.

5.2 COMPARISON OF RFPS

5.2.1 Does not apply.

5.2.2 The Agency reserves the right to waive technicalities, to reject any or all RFPs, or any portion thereof, to solicit for new RFPs, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.

5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.

5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.

5.2.5 Does not apply.

5.3 DISQUALIFICATION OF DESIGN-BUILDERS

5.3.1 An agency shall determine that each Design-Builder on any Public Works Contract is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Design-Builder include:

- A. The Design-Builder’s financial, physical, personnel or other resources including Subcontracts;
- B. The Design-Builder’s record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;
- C. The Design-Builder’s written safety plan;
- D. Whether the Design-Builder is qualified legally to contract with the State;

- E. Whether the Design-Builder supplied all necessary information concerning its responsibility; and,
- F. Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the RFP and is otherwise in conformity with State and/or Federal law.

5.3.2 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Design-Builder and the rejection of their RFP or RFPs.

5.3.2.1 More than one RFP for the same Contract from an individual, firm or corporation under the same or different names.

5.3.2.2 Evidence of collusion among Design-Builders.

5.3.2.3 Unsatisfactory performance record as evidenced by past experience.

5.3.2.4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.

5.3.2.5 If there are any unauthorized additions, interlineation, conditional or alternate RFPs or irregularities of any kind which may tend to make the RFP incomplete, indefinite or ambiguous as to its meaning.

5.3.2.6 If the RFP is not accompanied by the required Bid Security and other data required by the Design-Build Documents.

5.3.2.7 Does not apply.

5.4 ACCEPTANCE OF RFP AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Design-Builder within twenty (20) calendar days after the award of the Contract.

5.4.2 Does not apply.

5.4.3 Each RFP on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive RFP shall conform in all material respects to the requirements and criteria set forth in the Design-Build Documents.

5.4.4 The Agency shall have the right to accept Alternates in any order or combination.

5.4.5 The successful Design-Builder shall execute a formal contract, submit the required Insurance Certificate, and furnish good and sufficient bonds, in accordance with the General Requirements, within twenty (20) days of official notice of contract award. The successful Design-Builder shall provide two business days prior to contract execution, copies of the Employee Drug Testing Program for the Design-Builder and all listed Subcontractors.

Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the contract. Bonds shall remain in affect for period of two years after the date of substantial completion.

- 5.4.6 If the successful Design-Builder fails to execute the required Contract, Bond and all required information, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their RFP guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a forfeiture or as a penalty. Award will then be made to the next lowest qualified Design-Builder of the Work or readvertised, as the Agency may decide.
- 5.4.7 Each Design-Builder shall supply with its RFP its taxpayer identification number (i.e., federal employer identification number or social security number) and a copy of its Delaware business license, and should the vendor be awarded a contract, such vendor shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Design-Builder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Design-Builder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.
- 5.4.8 The Bid Security shall be returned to the successful Design-Builder upon the execution of the formal contract. The Bid Securities of unsuccessful Design-Builders shall be returned within thirty (30) calendar days after the opening of the RFPs.

ARTICLE 6: POST-RFP INFORMATION

- 6.1 DESIGN-BUILDER’S QUALIFICATION STATEMENT
- 6.1.1 Design-Builders to whom award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed AIA Document A305, Design-Builder’s Qualification Statement, unless such a statement has been previously required and submitted.
- 6.2 BUSINESS DESIGNATION FORM
- 6.2.1 Successful Design-Builder shall be required to accurately complete an Office of Management and Budget Business Designation Form for Subcontractors.

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

- 7.1 BOND REQUIREMENTS
- 7.1.1 The cost of furnishing the required Bonds that are stipulated in the Design-Build Documents, shall be included in the RFP amount.

7.1.2 If the Design-Builder is required by the Agency to secure a bond from other than the Design-Builder's usual sources, changes in cost will be adjusted as provided in the Design-Build Documents.

INSTRUCTIONS TO DESIGN-BUILDERS
11

00 21 13-

7.1.3 The Performance and Payment Bond forms used shall be the standard OMB forms (attached).

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The bonds shall be dated on or after the date of the Contract.

7.2.2 The Design-Builder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix a certified and current copy of the power of attorney.

ARTICLE 8: FORM OF AGREEMENT BETWEEN AGENCY AND DESIGN-BUILDER

8.1 Unless otherwise required in the Design-Build Documents, the Agreement for the Work will be written on AIA Document A141-2014, Standard Form of Agreement Between Owner and Design-Builder and Exhibit A and Exhibit B.

END OF INSTRUCTIONS TO DESIGN-BUILDERS

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DELAWARE ARMY NATIONAL GUARD
BETHANY BEACH TRAINING SITE
163 SCANNELL BLVD.
BETHANY BEACH, DELAWARE
DEARNG CONTRACT NO.: 2020-16**

BID FORM

BID OPTIONS (ALTERNATES) & BETTERMENTS

OPTIONS:

MOTEL CONCEPT

BID OPTION no M1 – Roofing

Base Bid – Standing Seam Metal Roofing

Bid Option no M1: In Lieu of Standing Seam Metal Roofing, provide 30 year Architectural grade Asphalt Shingles
(Provide GAF, “Timberline HTZ” or approved equal)

DELETE: \$ _____ (Date and Initial) _____

BID OPTION no M2 – Bathroom Showers

Base Bid – Pre-Fabricated Fiberglass units

Bid Option no M2: In Lieu of Pre-Fabricated Fiberglass units, provide in place site constructed showers. With tile on the gyp board walls and tile on the floor, and frameless glass door and vertical enclosure panels

ADD: \$ _____ (Date and Initial) _____

VILLAGE CONCEPT

BID OPTION no V1 – Additional Unit

Base Bid – Provide Units no’s 2 (ADA), 3 & 4

Bid Option no V1: Add Unit no 1

ADD: \$ _____ (Date and Initial) _____

BID OPTION no V2 – Additional Unit

Base Bid – Provide Units no’s 2 (ADA), 3 & 4

Bid Option no V2: Add Unit no 5 (with exterior deck)

ADD: \$ _____ (Date and Initial) _____

BID OPTION no V3 – Additional Unit

Base Bid – Provide Units no’s 2 (ADA), 3 & 4

Bid Option no V3: Add Unit no 6

ADD: \$ _____ (Date and Initial) _____

BETTERMENTS:

Use this page and or attachments(s) with supporting documentation, for describing any building system components, and or materials that are provided with your Base Bid Design, which provide enhanced Quality (use or longevity), or Sustainability to the intended systems goals outlined in the section C. Div 01 General Requirements, Statement of Work Narratives (Parts 00-15) and the Concept Drawings Attachment .

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DEARNG CONTRACT NO.: 2020-16**

BID FORM

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ **By:** _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Sub-Contractor List
- Non-Collusion Statement
- Affidavit of Employee Drug Testing Program
- Affidavit of Contractor Qualifications
- Bid Security
- (Others as Required by Project Manuals)

**TRANSIENT TRAINING OFFICER BARRACKS
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BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder may not insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (*) next to any additional third-tier contractors, and submit it with your bid.

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax-payer ID # or Delaware Business license #</u>
1.	A.	_____	_____
	B.	_____	_____
	C.	_____	_____
2.	A.	_____	_____
	B.	_____	_____
	C.	_____	_____

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BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date.

All the terms and conditions of *DEARNG NO.: 2020-16* have been thoroughly examined and are understood.

NAME OF BIDDER: _____

**AUTHORIZED REPRESENTATIVE
(TYPED):** _____

**AUTHORIZED REPRESENTATIVE
(SIGNATURE):** _____

TITLE: _____

ADDRESS OF BIDDER: _____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

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**AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

**TRANSIENT TRAINING OFFICER BARRACKS
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**AFFIDAVIT
OF
CONTRACTOR QUALIFICATIONS**

We hereby certify that we will abide by the contractor's qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

Contractor Name: _____

Contractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

STATE OF DELAWARE
DELAWARE ARMY NATIONAL GUARD

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____
_____ of _____ in the County of _____
_____ and State of _____ as **Principal**, and _____
_____ of _____ in the County of _____
and State of _____ as **Surety**, legally authorized to do business in the State of Delaware
("State"), are held and firmly unto the **State** in the sum of _____
_____ Dollars (\$_____), or _____ percent not to exceed _____
_____ Dollars (\$_____)
of amount of bid on DEARNG Contract No. _____, to be paid to the **State** for the use and
benefit of Delaware National Guard for which payment well and truly to be made, we do bind ourselves, our
and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole
firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bonded **Principal**
who has submitted to the Delaware National Guard a certain proposal to enter into this contract for the
furnishing of certain material and/or services within the **State**, shall be awarded this Contract, and if said
Principal shall well and truly enter into and execute this Contract as may be required by the terms of this
Contract and approved by the Delaware National Guard this Contract to be entered into within twenty days
after the date of official notice of the award thereof in accordance with the terms of said proposal, then this
obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____ day of _____ in the year of our Lord two
thousand and _____ (20____).

SEALED, AND DELIVERED IN THE
Presence of

Name of Bidder (Organization)

Corporate
Seal

By:

Authorized Signature

Attest _____

Title

Name of Surety

TRANSIENT TRAINING OFFICER BARRACKS DEARNG – BETHANY BEACH TRAINING SITE
DEARNG NO.: 2020-16 BETHANY BEACH, DELAWARE

Witness: _____

By: _____

Title

SECTION 00 52 13

**STANDARD FORM OF AGREEMENT BETWEEN OWNER AND DESIGN/BUILDER
A141-2014**

The contract to be utilized on this project shall be the “Standard Form of Agreement Between Owner and Design/Builder” AIA Document A141-2014, including AIA Document A141-2014 Exhibit B and Exhibit C.

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DRAFT AIA® Document A141® - 2014

Standard Form of Agreement Between Owner and Design-Builder

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

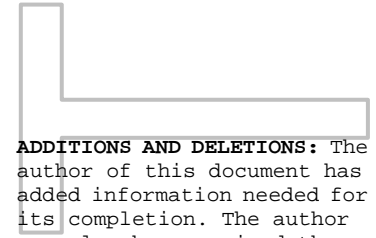
and the Design-Builder:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

DEARNG – Bethany Beach Training Site
Transient Training Officer Barracks
Bethany Beach, Delaware
DEARNG No.: 2020-16

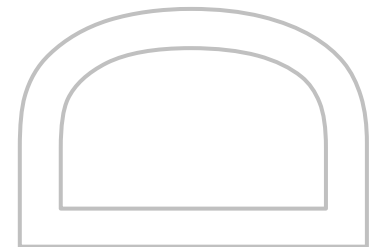
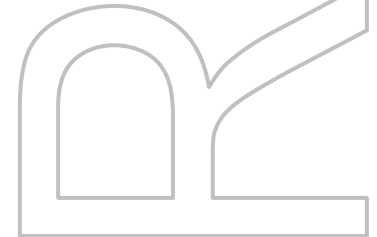
The Owner and Design-Builder agree as follows.



ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Consultation with an attorney is also encouraged with respect to professional licensing requirements in the jurisdiction where the Project is located.



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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Owner’s Criteria

This Agreement is based on the Owner’s Criteria set forth in this Section 1.1.

(Note the disposition for the following items by inserting the requested information or a statement such as “not applicable” or “unknown at time of execution.” If the Owner intends to provide a set of design documents, and the requested information is contained in the design documents, identify the design documents and insert “see Owner’s design documents” where appropriate.) – See Summary of Work and Supporting Documents (Exhibit); Bridging Document drawings, System Narratives,

§ 1.1.1 The Owner’s program for the Project:

(Set forth the program, identify documentation in which the program is set forth, or state the manner in which the program will be developed.)

See 1391 & Program Matrix



§ 1.1.2 The Owner's design requirements for the Project and related documentation:
(Identify below, or in an attached exhibit, the documentation that contains the Owner's design requirements, including any performance specifications for the Project.)

« »

§ 1.1.3 The Project's physical characteristics:
(Identify or describe, if appropriate, size, location, dimensions, or other pertinent information, such as geotechnical reports; site, boundary and topographic surveys; traffic and utility studies; availability of public and private utilities and services; legal description of the site; etc.)

See supporting documents Exhibit

§ 1.1.4 The Owner's anticipated Sustainable Objective for the Project, if any:
(Identify the Owner's Sustainable Objective for the Project such as Sustainability Certification, benefit to the environment, enhancement to the health and well-being of building occupants, or improvement of energy efficiency. If the Owner identifies a Sustainable Objective, incorporate AIA Document A141™-2014, Exhibit C, Sustainable Projects, into this Agreement to define the terms, conditions and Work related to the Owner's Sustainable Objective.)

This project shall achieve US Green Building Council LEED IV Silver Certificate

§ 1.1.5 Incentive programs the Owner intends to pursue for the Project, including those related to the Sustainable Objective, and any deadlines for receiving the incentives that are dependent on, or related to, the Design-Builder's services, are as follows:
(Identify incentive programs the Owner intends to pursue for the Project and deadlines for submitting or applying for the incentive programs.)

N/A

§ 1.1.6 The Owner's budget for the Work to be provided by the Design-Builder is set forth below:
(Provide total for Owner's budget, and if known, a line item breakdown of costs.)

« »

§ 1.1.7 The Owner's design and construction milestone dates:

.1 Pre-Award Phase:

Bid Posting: 2 weeks – (5/22 & 5/29)
Pre0Proposal meeting: 1 day – (6/6/23) In person at DEARNG HQ)
DB Proposal due: 7 weeks (7/27/23)
De-scope – 7/27 - 8/18
Award – 8/21

.2 Design Phase:

- 60 % Submission
- Submission for review - 8 weeks (includes 2 weeks for Fire Marshal & AAB Reviews)
- Review Period: 3 weeks - (Owner/Tt, NGB & OMB/DFM)
- Review Meetings & Responses - the week following the Review Period
- OMB/DFM - Review Meeting - 1 day (Group Screen Share Call)
- Owner's Review Meeting - 1 day (In person at DEARNG HQ)
- Submit Responses to NGB Comments

- 99 % Submission
- Submission for review - 6 weeks (Owner/Tt, NGB & OMB/DFM)
- Review Period: 3 weeks (Owner/Tt, NGB & OMB/DFM)

- Review Meetings & Responses - the week following the Review Period
 - OMB/DFM - Review Meeting - 1 day (Group Screen Share Call)
 - Owner's Review Meeting - 1 day (In person at DEARNG HQ)
 - Submit responses to NGB

- 100 % Submission
 - Submission for review - 4 weeks
 - Owner's/Tt & NGB Final Comments - 2 weeks

- Corrected Final Submission - 2 weeks

3 Construction Phase:

- Substantial Completion - 12 Months (follows Design Phase 3)
- Punch List and Close out - 2 Months

§ 1.1.8 The Owner requires the Design-Builder to retain the following Delaware Licensed Professional Design Team:
 (List name, legal status, address and other information.)

.1 Architect

« »

.2 Civil

« »

.3 Structural

« »

.4 Mechanical

« »

.5 Plumbing

« »

.6 Electrical

« »

.7 Fire Protection

« »



§ 1.1.9 Additional Owner's Criteria upon which the Agreement is based:
 (Identify special characteristics or needs of the Project not identified elsewhere, such as historic preservation requirements.)

« »

§ 1.1.10 The Design-Builder shall confirm that the information included in the Owner's Criteria complies with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 1.1.10.1 If the Owner's Criteria conflicts with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Design-Builder shall notify the Owner of the conflict.

§ 1.1.11 If there is a change in the Owner's Criteria, the Owner and the Design-Builder shall execute a Modification in accordance with Article 6.

§ 1.1.12 If the Owner and Design-Builder intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions. Unless otherwise agreed, the parties will use AIA Document E203™-2013 to establish the protocols for the development, use, transmission, and exchange of digital data and building information modeling.

§ 1.2 Project Team

§ 1.2.1 The Owner identifies the following representative in accordance with Section 7.1.1:
(List name, address and other information.)

« »
« »
« »
« »
« »
« »

§ 1.2.2 The persons or entities, in addition to the Owner's representative, who are required to review the Design-Builder's Submittals are as follows:
(List name, address and other information.)

« »

§ 1.2.3 The Owner will retain the following consultants and separate contractors:
(List discipline, scope of work, and, if known, identify by name and address.)

« »

§ 1.2.4 The Design-Builder identifies the following representative in accordance with Section 3.1.2:
(List name, address and other information.)

1. Tetra Tech (Design Reviews and CA Tracking)
2. Commissioning Agent (TBD)
3. Material Testing (TBD)

« »
« »
« »

§ 1.2.5 Neither the Owner's nor the Design-Builder's representative shall be changed without ten days' written notice to the other party.

§ 1.3 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Section 14.3, the method of binding dispute resolution shall be the following:

(Check the appropriate box. If the Owner and Design-Builder do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

Arbitration pursuant to Section 14.4

Litigation in a court of competent jurisdiction

Other: *(Specify)*

Any remedies available in law or in equity.

§ 1.4 Definitions

§ 1.4.1 Design-Build Documents. The Design-Build Documents consist of this Agreement between Owner and Design-Builder and its attached Exhibits (hereinafter, the “Agreement”); other documents listed in this Agreement; and Modifications issued after execution of this Agreement. A Modification is (1) a written amendment to the Contract signed by both parties, including the Design-Build Amendment, (2) a Change Order, or (3) a Change Directive.

§ 1.4.2 The Contract. The Design-Build Documents form the Contract. The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Design-Build Documents shall not be construed to create a contractual relationship of any kind between any persons or entities other than the Owner and the Design-Builder.

§ 1.4.3 The Work. The term “Work” means the design, construction and related services required to fulfill the Design-Builder’s obligations under the Design-Build Documents, whether completed or partially completed, and includes all labor, materials, equipment and services provided or to be provided by the Design-Builder. The Work may constitute the whole or a part of the Project.

§ 1.4.4 The Project. The Project is the total design and construction of which the Work performed under the Design-Build Documents may be the whole or a part, and may include design and construction by the Owner and by separate contractors.

§ 1.4.5 Instruments of Service. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Design-Builder, Contractor(s), Architect, and Consultant(s) under their respective agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, digital models and other similar materials.

§ 1.4.6 Submittal. A Submittal is any submission to the Owner for review and approval demonstrating how the Design-Builder proposes to conform to the Design-Build Documents for those portions of the Work for which the Design-Build Documents require Submittals. Submittals include, but are not limited to, shop drawings, product data, and samples. Submittals are not Design-Build Documents unless incorporated into a Modification.

§ 1.4.7 Owner. The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Design-Build Documents as if singular in number. The term “Owner” means the Owner or the Owner’s authorized representative.

§ 1.4.8 Design-Builder. The Design-Builder is the person or entity identified as such in the Agreement and is referred to throughout the Design-Build Documents as if singular in number. The term “Design-Builder” means the Design-Builder or the Design-Builder’s authorized representative.

§ 1.4.9 Consultant. A Consultant is a person or entity providing professional services for the Design-Builder for all or a portion of the Work, and is referred to throughout the Design-Build Documents as if singular in number. To the extent required by the relevant jurisdiction, the Consultant shall be lawfully licensed to provide the required professional services.

§ 1.4.10 Architect. The Architect is a person or entity providing design services for the Design-Builder for all or a portion of the Work, and is lawfully licensed to practice architecture in the applicable jurisdiction. The Architect is referred to throughout the Design-Build Documents as if singular in number.

§ 1.4.11 Contractor. A Contractor is a person or entity performing all or a portion of the construction, required in connection with the Work, for the Design-Builder. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor is referred to throughout the Design-Build Documents as if singular in number and means a Contractor or an authorized representative of the Contractor.

§ 1.4.12 Confidential Information. Confidential Information is information containing confidential or business proprietary information that is clearly marked as “confidential.”

§ 1.4.13 Contract Time. Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, as set forth in the Design-Build Amendment for Substantial Completion of the Work.

§ 1.4.14 Day. The term “day” as used in the Design-Build Documents shall mean calendar day unless otherwise specifically defined.

§ 1.4.15 Contract Sum. The Contract Sum is the amount to be paid to the Design-Builder for performance of the Work after execution of the Design-Build Amendment, as identified in Article A.1 of the Design-Build Amendment.

ARTICLE 2 COMPENSATION AND PROGRESS PAYMENTS

§ 2.1 Compensation for Work Performed Prior To Execution of Design-Build Amendment

§ 2.1.1 Unless otherwise agreed, payments for Work performed prior to Execution of the Design-Build Amendment shall be made monthly. For the Design-Builder’s performance of Work prior to the execution of the Design-Build Amendment, the Owner shall compensate the Design-Builder as follows:

(Insert amount of, or basis for, compensation, including compensation for any Sustainability Services, or indicate the exhibit in which the information is provided. If there will be a limit on the total amount of compensation for Work performed prior to the execution of the Design-Build Amendment, state the amount of the limit.)

« »

§ 2.1.2 The hourly billing rates for services of the Design-Builder and the Design-Builder’s Architect, Consultants and Contractors, if any, are set forth below.

(If applicable, attach an exhibit of hourly billing rates or insert them below.)

« »

Individual or Position

Rate

§ 2.1.3 Compensation for Reimbursable Expenses Prior To Execution of Design-Build Amendment

§ 2.1.3.1 Reimbursable Expenses are in addition to compensation set forth in Section 2.1.1 and 2.1.2 and include expenses, directly related to the Project, incurred by the Design-Builder and the Design-Builder’s Architect, Consultants, and Contractors, as follows:

- .1 Transportation and authorized out-of-town travel and subsistence;
- .2 Dedicated data and communication services, teleconferences, Project web sites, and extranets;
- .3 Fees paid for securing approval of authorities having jurisdiction over the Project;
- .4 Printing, reproductions, plots, standard form documents;
- .5 Postage, handling and delivery;
- .6 Expense of overtime work requiring higher than regular rates, if authorized in advance by the Owner;
- .7 Renderings, physical models, mock-ups, professional photography, and presentation materials requested by the Owner;
- .8 All taxes levied on professional services and on reimbursable expenses; and
- .9 Other Project-related expenditures, if authorized in advance by the Owner.

§ 2.1.3.2 For Reimbursable Expenses, the compensation shall be the expenses the Design-Builder and the Design-Builder’s Architect, Consultants and Contractors incurred, plus an administrative fee of « » percent (« » %) of the expenses incurred.

§ 2.1.4 Payments to the Design-Builder Prior To Execution of Design-Build Amendment

§ 2.1.4.1 Payments are due and payable upon presentation of the Design-Builder’s invoice. Amounts unpaid thirty (30) days after the invoice date shall bear interest at the rate entered below, or in the absence thereof at the legal rate prevailing from time to time at the principal place of business of the Design-Builder.

(Insert rate of monthly or annual interest agreed upon.)

1 % per month not to exceed 12% per annum.

§ 2.1.4.2 Records of Reimbursable Expenses and services performed on the basis of hourly rates shall be available to the Owner at mutually convenient times for a period of two years following execution of the Design-Build Amendment or termination of this Agreement, whichever occurs first.

§ 2.2 Contract Sum and Payment for Work Performed After Execution of Design-Build Amendment
For the Design-Builder's performance of the Work after execution of the Design-Build Amendment, the Owner shall pay to the Design-Builder the Contract Sum in current funds as agreed in the Design-Build Amendment.

ARTICLE 3 GENERAL REQUIREMENTS OF THE WORK OF THE DESIGN-BUILD CONTRACT

§ 3.1 General

§ 3.1.1 The Design-Builder shall comply with any applicable licensing requirements in the jurisdiction where the Project is located.

§ 3.1.2 The Design-Builder shall designate in writing a representative who is authorized to act on the Design-Builder's behalf with respect to the Project.

§ 3.1.3 The Design-Builder shall perform the Work in accordance with the Design-Build Documents. The Design-Builder shall not be relieved of the obligation to perform the Work in accordance with the Design-Build Documents by the activities, tests, inspections or approvals of the Owner.

§ 3.1.3.1 The Design-Builder shall perform the Work in compliance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities. If the Design-Builder performs Work contrary to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, the Design-Builder shall assume responsibility for such Work and shall bear the costs attributable to correction.

§ 3.1.3.2 Neither the Design-Builder nor any Contractor, Consultant, or Architect shall be obligated to perform any act which they believe will violate any applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities. If the Design-Builder determines that implementation of any instruction received from the Owner, including those in the Owner's Criteria, would cause a violation of any applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Design-Builder shall notify the Owner in writing. Upon verification by the Owner that a change to the Owner's Criteria is required to remedy the violation, the Owner and the Design-Builder shall execute a Modification in accordance with Article 6.

§ 3.1.4 The Design-Builder shall be responsible to the Owner for acts and omissions of the Design-Builder's employees, Architect, Consultants, Contractors, and their agents and employees, and other persons or entities performing portions of the Work.

§ 3.1.5 General Consultation. The Design-Builder shall schedule and conduct periodic meetings with the Owner to review matters such as procedures, progress, coordination, and scheduling of the Work.

§ 3.1.6 When applicable law requires that services be performed by licensed professionals, the Design-Builder shall provide those services through qualified, licensed professionals. The Owner understands and agrees that the services of the Design-Builder's Architect and the Design-Builder's other Consultants are performed in the sole interest of, and for the exclusive benefit of, the Design-Builder.

§ 3.1.7 The Design-Builder, with the assistance of the Owner, shall prepare and file documents required to obtain necessary approvals of governmental authorities having jurisdiction over the Project.

§ 3.1.8 Progress Reports

§ 3.1.8.1 The Design-Builder shall keep the Owner informed of the progress and quality of the Work. On a monthly basis, or otherwise as agreed to by the Owner and Design-Builder, the Design-Builder shall submit written progress reports to the Owner, showing estimated percentages of completion and other information identified below:

- .1 Work completed for the period;
- .2 Project schedule status;

- .3 Submittal schedule and status report, including a summary of outstanding Submittals;
- .4 Responses to requests for information to be provided by the Owner;
- .5 Approved Change Orders and Change Directives;
- .6 Pending Change Order and Change Directive status reports;
- .7 Tests and inspection reports;
- .8 Status report of Work rejected by the Owner;
- .9 Status of Claims previously submitted in accordance with Article 14;
- .10 Cumulative total of the Cost of the Work to date including the Design-Builder's compensation and Reimbursable Expenses, if any;
- .11 Current Project cash-flow and forecast reports; and
- .12 Additional information as agreed to by the Owner and Design-Builder.

§ 3.1.8.2 In addition, where the Contract Sum is the Cost of the Work with or without a Guaranteed Maximum Price, the Design-Builder shall include the following additional information in its progress reports:

- .1 Design-Builder's work force report;
- .2 Equipment utilization report; and
- .3 Cost summary, comparing actual costs to updated cost estimates.
- .4 Receipt of close out documents.
- .5 Receipt of verification of LEED 4.0 Certification (1% retainage)

§ 3.1.9 Design-Builder's Schedules

§ 3.1.9.1 The Design-Builder, promptly after execution of this Agreement, shall prepare and submit for the Owner's information a schedule for the Work. The schedule, including the time required for design and construction, shall not exceed time limits current under the Design-Build Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Design-Build Documents, shall provide for expeditious and practicable execution of the Work, and shall include allowances for periods of time required for the Owner's review and for approval of submissions by authorities having jurisdiction over the Project.

§ 3.1.9.2 The Design-Builder shall perform the Work in general accordance with the most recent schedules submitted to the Owner.

§ 3.1.10 Certifications. Upon the Owner's written request, the Design-Builder shall obtain from the Architect, Consultants, and Contractors, and furnish to the Owner, certifications with respect to the documents and services provided by the Architect, Consultants, and Contractors (a) that, to the best of their knowledge, information and belief, the documents or services to which the certifications relate (i) are consistent with the Design-Build Documents, except to the extent specifically identified in the certificate, and (ii) comply with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities governing the design of the Project; and (b) that the Owner and its consultants shall be entitled to rely upon the accuracy of the representations and statements contained in the certifications. The Design-Builder's Architect, Consultants, and Contractors shall not be required to execute certificates or consents that would require knowledge, services or responsibilities beyond the scope of their services.

§ 3.1.11 Design-Builder's Submittals

§ 3.1.11.1 Prior to submission of any Submittals, the Design-Builder shall prepare a Submittal schedule, and shall submit the schedule for the Owner's approval. The Owner's approval shall not unreasonably be delayed or withheld. The Submittal schedule shall (1) be coordinated with the Design-Builder's schedule provided in Section 3.1.9.1, (2) allow the Owner reasonable time to review Submittals, and (3) be periodically updated to reflect the progress of the Work. If the Design-Builder fails to submit a Submittal schedule, the Design-Builder shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of Submittals.

§ 3.1.11.2 By providing Submittals the Design-Builder represents to the Owner that it has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Design-Build Documents.

§ 3.1.11.3 The Design-Builder shall perform no portion of the Work for which the Design-Build Documents require Submittals until the Owner has approved the respective Submittal.

§ 3.1.11.4 The Work shall be in accordance with approved Submittals except that the Design-Builder shall not be relieved of its responsibility to perform the Work consistent with the requirements of the Design-Build Documents. The Work may deviate from the Design-Build Documents only if the Design-Builder has notified the Owner in writing of a deviation from the Design-Build Documents at the time of the Submittal and a Modification is executed authorizing the identified deviation. The Design-Builder shall not be relieved of responsibility for errors or omissions in Submittals by the Owner's approval of the Submittals.

§ 3.1.11.5 All professional design services or certifications to be provided by the Design-Builder, including all drawings, calculations, specifications, certifications, shop drawings and other Submittals, shall contain the signature and seal of the licensed design professional preparing them. Submittals related to the Work designed or certified by the licensed design professionals, if prepared by others, shall bear the licensed design professional's written approval. The Owner and its consultants shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals.

§ 3.1.12 Warranty. The Design-Builder warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless the Design-Build Documents require or permit otherwise. The Design-Builder further warrants that the Work will conform to the requirements of the Design-Build Documents and will be free from defects, except for those inherent in the quality of the Work or otherwise expressly permitted by the Design-Build Documents. Work, materials, or equipment not conforming to these requirements may be considered defective. The Design-Builder's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Design-Builder, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Owner, the Design-Builder shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.1.13 Royalties, Patents and Copyrights

§ 3.1.13.1 The Design-Builder shall pay all royalties and license fees.

§ 3.1.13.2 The Design-Builder shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and its separate contractors and consultants harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Owner, or where the copyright violations are required in the Owner's Criteria. However, if the Design-Builder has reason to believe that the design, process or product required in the Owner's Criteria is an infringement of a copyright or a patent, the Design-Builder shall be responsible for such loss unless such information is promptly furnished to the Owner. If the Owner receives notice from a patent or copyright owner of an alleged violation of a patent or copyright, attributable to the Design-Builder, the Owner shall give prompt written notice to the Design-Builder.

§ 3.1.14 Indemnification

§ 3.1.14.1 To the fullest extent permitted by law, the Design-Builder shall indemnify and hold harmless the Owner, including the Owner's agents and employees, from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, but only to the extent caused by the negligent acts or omissions of the Design-Builder, Architect, a Consultant, a Contractor, or anyone directly or indirectly employed by them or anyone for whose acts they may be liable. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.1.14.

§ 3.1.14.2 The indemnification obligation under this Section 3.1.14 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for Design-Builder, Architect, a Consultant, a Contractor, or anyone directly or indirectly employed by them, under workers' compensation acts, disability benefit acts or other employee benefit acts.

§ 3.1.15 Contingent Assignment of Agreements

§ 3.1.15.1 Each agreement for a portion of the Work is assigned by the Design-Builder to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause, pursuant to Sections 13.1.4 or 13.2.2, and only for those agreements that the Owner accepts by written notification

- to the Design-Builder and the Architect, Consultants, and Contractors whose agreements are accepted for assignment; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of an agreement, the Owner assumes the Design-Builder's rights and obligations under the agreement.

§ 3.1.15.2 Upon such assignment, if the Work has been suspended for more than 30 days, the compensation under the assigned agreement shall be equitably adjusted for increases in cost resulting from the suspension.

§ 3.1.15.3 Upon such assignment to the Owner under this Section 3.1.15, the Owner may further assign the agreement to a successor design-builder or other entity. If the Owner assigns the agreement to a successor design-builder or other entity, the Owner shall nevertheless remain legally responsible for all of the successor design-builder's or other entity's obligations under the agreement.

§ 3.1.16 Design-Builder's Insurance and Bonds. The Design-Builder shall purchase and maintain insurance and provide bonds as set forth in Exhibit B.

ARTICLE 4 WORK PRIOR TO EXECUTION OF THE DESIGN-BUILD AMENDMENT

§ 4.1 General

§ 4.1.1 Any information submitted by the Design-Builder, and any interim decisions made by the Owner, shall be for the purpose of facilitating the design process and shall not modify the Owner's Criteria unless the Owner and Design-Builder execute a Modification.

§ 4.1.2 The Design-Builder shall advise the Owner on proposed site use and improvements, selection of materials, and building systems and equipment. The Design-Builder shall also provide the Owner with recommendations, consistent with the Owner's Criteria, on constructability; availability of materials and labor; time requirements for procurement, installation and construction; and factors related to construction cost including, but not limited to, costs of alternative designs or materials, preliminary budgets, life-cycle data, and possible cost reductions.

§ 4.2 Evaluation of the Owner's Criteria

§ 4.2.1 The Design-Builder shall schedule and conduct meetings with the Owner and any other necessary individuals or entities to discuss and review the Owner's Criteria as set forth in Section 1.1. The Design-Builder shall thereafter again meet with the Owner to discuss a preliminary evaluation of the Owner's Criteria. The preliminary evaluation shall address possible alternative approaches to design and construction of the Project and include the Design-Builder's recommendations, if any, with regard to accelerated or fast-track scheduling, procurement, or phased construction. The preliminary evaluation shall consider cost information, constructability, and procurement and construction scheduling issues.

§ 4.2.2 After the Design-Builder meets with the Owner and presents the preliminary evaluation, the Design-Builder shall provide a written report to the Owner, summarizing the Design-Builder's evaluation of the Owner's Criteria. The report shall also include

- .1 allocations of program functions, detailing each function and their square foot areas;
- .2 a preliminary estimate of the Cost of the Work, and, if necessary, recommendations to adjust the Owner's Criteria to conform to the Owner's budget;
- .3 a preliminary schedule, which shall include proposed design milestones; dates for receiving additional information from, or for work to be completed by, the Owner; anticipated date for the Design-Builder's Proposal; and dates of periodic design review sessions with the Owner; and
- .4 the following:
(List additional information, if any, to be included in the Design-Builder's written report.)

« »

§ 4.2.3 The Owner shall review the Design-Builder's written report and, if acceptable, provide the Design-Builder with written consent to proceed to the development of the Preliminary Design as described in Section 4.3. The consent

to proceed shall not be understood to modify the Owner's Criteria unless the Owner and Design-Builder execute a Modification.

§ 4.3 Preliminary Design

§ 4.3.1 Upon the Owner's issuance of a written consent to proceed under Section 4.2.3, the Design-Builder shall prepare and submit a Preliminary Design to the Owner. The Preliminary Design shall include a report identifying any deviations from the Owner's Criteria, and shall include the following:

- .1 Confirmation of the allocations of program functions;
- .2 Site plan;
- .3 Building plans, sections and elevations;
- .4 Structural system;
- .5 Selections of major building systems, including but not limited to mechanical, electrical and plumbing systems; and
- .6 Outline specifications or sufficient drawing notes describing construction materials.

The Preliminary Design may include some combination of physical study models, perspective sketches, or digital modeling.

§ 4.3.2 The Owner shall review the Preliminary Design and, if acceptable, provide the Design-Builder with written consent to proceed to development of the Design-Builder's Proposal. The Preliminary Design shall not modify the Owner's Criteria unless the Owner and Design-Builder execute a Modification.

§ 4.4 Design-Builder's Proposal

§ 4.4.1 Upon the Owner's issuance of a written consent to proceed under Section 4.3.2, the Design-Builder shall prepare and submit the Design-Builder's Proposal to the Owner. The Design-Builder's Proposal shall include the following:

- .1 A list of the Preliminary Design documents and other information, including the Design-Builder's clarifications, assumptions and deviations from the Owner's Criteria, upon which the Design-Builder's Proposal is based;
- .2 The proposed Contract Sum, including the compensation method and, if based upon the Cost of the Work plus a fee, a written statement of estimated cost organized by trade categories, allowances, contingencies, Design-Builder's Fee, and other items that comprise the Contract Sum;
- .3 The proposed date the Design-Builder shall achieve Substantial Completion;
- .4 An enumeration of any qualifications and exclusions, if applicable;
- .5 A list of the Design-Builder's key personnel, Contractors and suppliers; and
- .6 The date on which the Design-Builder's Proposal expires.

§ 4.4.2 Submission of the Design-Builder's Proposal shall constitute a representation by the Design-Builder that it has visited the site and become familiar with local conditions under which the Work is to be completed.

§ 4.4.3 If the Owner and Design-Builder agree on a proposal, the Owner and Design-Builder shall execute the Design-Build Amendment setting forth the terms of their agreement.

ARTICLE 5 WORK FOLLOWING EXECUTION OF THE DESIGN-BUILD AMENDMENT

§ 5.1 Construction Documents

§ 5.1.1 Upon the execution of the Design-Build Amendment, the Design-Builder shall prepare Construction Documents. The Construction Documents shall establish the quality levels of materials and systems required. The Construction Documents shall be consistent with the Design-Build Documents.

§ 5.1.2 The Design-Builder shall provide the Construction Documents to the Owner for the Owner's information. If the Owner discovers any deviations between the Construction Documents and the Design-Build Documents, the Owner shall promptly notify the Design-Builder of such deviations in writing. The Construction Documents shall not modify the Design-Build Documents unless the Owner and Design-Builder execute a Modification. The failure of the Owner to discover any such deviations shall not relieve the Design-Builder of the obligation to perform the Work in accordance with the Design-Build Documents.

§ 5.2 Construction

§ 5.2.1 Commencement. Except as permitted in Section 5.2.2, construction shall not commence prior to execution of the Design-Build Amendment.

§ 5.2.2 If the Owner and Design-Builder agree in writing, construction may proceed prior to the execution of the Design-Build Amendment. However, such authorization shall not waive the Owner's right to reject the Design-Builder's Proposal.

§ 5.2.3 The Design-Builder shall supervise and direct the Work, using the Design-Builder's best skill and attention. The Design-Builder shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work under the Contract, unless the Design-Build Documents give other specific instructions concerning these matters.

§ 5.2.4 The Design-Builder shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 5.3 Labor and Materials

§ 5.3.1 Unless otherwise provided in the Design-Build Documents, the Design-Builder shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services, necessary for proper execution and completion of the Work, whether temporary or permanent, and whether or not incorporated or to be incorporated in the Work.

§ 5.3.2 When a material or system is specified in the Design-Build Documents, the Design-Builder may make substitutions only in accordance with Article 6.

§ 5.3.3 The Design-Builder shall enforce strict discipline and good order among the Design-Builder's employees and other persons carrying out the Work. The Design-Builder shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 5.4 Taxes

The Design-Builder shall pay sales, consumer, use and similar taxes, for the Work provided by the Design-Builder, that are legally enacted when the Design-Build Amendment is executed, whether or not yet effective or merely scheduled to go into effect.

§ 5.5 Permits, Fees, Notices and Compliance with Laws

§ 5.5.1 Unless otherwise provided in the Design-Build Documents, the Design-Builder shall secure and pay for the building permit as well as any other permits, fees, licenses, and inspections by government agencies, necessary for proper execution of the Work and Substantial Completion of the Project.

§ 5.5.2 The Design-Builder shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, applicable to performance of the Work.

§ 5.5.3 Concealed or Unknown Conditions. If the Design-Builder encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Design-Build Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Design-Build Documents, the Design-Builder shall promptly provide notice to the Owner before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Owner shall promptly investigate such conditions and, if the Owner determines that they differ materially and cause an increase or decrease in the Design-Builder's cost of, or time required for, performance of any part of the Work, shall recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Owner determines that the conditions at the site are not materially different from those indicated in the Design-Build Documents and that no change in the terms of the Contract is justified, the Owner shall promptly notify the Design-Builder in writing, stating the reasons. If the Design-Builder disputes the Owner's determination or recommendation, the Design-Builder may proceed as provided in Article 14.

§ 5.5.4 If, in the course of the Work, the Design-Builder encounters human remains, or recognizes the existence of burial markers, archaeological sites, or wetlands, not indicated in the Design-Build Documents, the Design-Builder shall immediately suspend any operations that would affect them and shall notify the Owner. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Design-Builder shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 14.

§ 5.6 Allowances

§ 5.6.1 The Design-Builder shall include in the Contract Sum all allowances stated in the Design-Build Documents. Items covered by allowances shall be supplied for such amounts, and by such persons or entities as the Owner may direct, but the Design-Builder shall not be required to employ persons or entities to whom the Design-Builder has reasonable objection.

§ 5.6.2 Unless otherwise provided in the Design-Build Documents,

- .1 allowances shall cover the cost to the Design-Builder of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 the Design-Builder's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts, shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 5.6.2.1 and (2) changes in Design-Builder's costs under Section 5.6.2.2.

§ 5.6.3 The Owner shall make selections of materials and equipment with reasonable promptness for allowances requiring Owner selection.

§ 5.7 Key Personnel, Contractors and Suppliers

§ 5.7.1 The Design-Builder shall not employ personnel, or contract with Contractors or suppliers to whom the Owner has made reasonable and timely objection. The Design-Builder shall not be required to contract with anyone to whom the Design-Builder has made reasonable and timely objection.

§ 5.7.2 If the Design-Builder changes any of the personnel, Contractors or suppliers identified in the Design-Build Amendment, the Design-Builder shall notify the Owner and provide the name and qualifications of the new personnel, Contractor or supplier. The Owner may reply within 14 days to the Design-Builder in writing, stating (1) whether the Owner has reasonable objection to the proposed personnel, Contractor or supplier or (2) that the Owner requires additional time to review. Failure of the Owner to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.7.3 Except for those persons or entities already identified or required in the Design-Build Amendment, the Design-Builder, as soon as practicable after execution of the Design-Build Amendment, shall furnish in writing to the Owner the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner may reply within 14 days to the Design-Builder in writing stating (1) whether the Owner has reasonable objection to any such proposed person or entity or (2) that the Owner requires additional time for review. Failure of the Owner to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.7.3.1 If the Owner has reasonable objection to a person or entity proposed by the Design-Builder, the Design-Builder shall propose another to whom the Owner has no reasonable objection. If the rejected person or entity was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute person or entity's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Design-Builder has acted promptly and responsively in submitting names as required.

§ 5.8 Documents and Submittals at the Site

The Design-Builder shall maintain at the site for the Owner one copy of the Design-Build Documents and a current set of the Construction Documents, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Submittals. The Design-Builder shall deliver these items to the Owner in accordance with Section 9.10.2 as a record of the Work as constructed.

§ 5.9 Use of Site

The Design-Builder shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Design-Build Documents, and shall not unreasonably encumber the site with materials or equipment.

§ 5.10 Cutting and Patching

The Design-Builder shall not cut, patch or otherwise alter fully or partially completed construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Design-Builder shall not unreasonably withhold from the Owner or a separate contractor the Design-Builder's consent to cutting or otherwise altering the Work.

§ 5.11 Cleaning Up

§ 5.11.1 The Design-Builder shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Design-Builder shall remove waste materials, rubbish, the Design-Builder's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 5.11.2 If the Design-Builder fails to clean up as provided in the Design-Build Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Design-Builder.

§ 5.12 Access to Work

The Design-Builder shall provide the Owner and its separate contractors and consultants access to the Work in preparation and progress wherever located. The Design-Builder shall notify the Owner regarding Project safety criteria and programs, which the Owner, and its contractors and consultants, shall comply with while at the site.

§ 5.13 Construction by Owner or by Separate Contractors

§ 5.13.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 5.13.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces; and to award separate contracts in connection with other portions of the Project, or other construction or operations on the site, under terms and conditions identical or substantially similar to this Contract, including those terms and conditions related to insurance and waiver of subrogation. The Owner shall notify the Design-Builder promptly after execution of any separate contract. If the Design-Builder claims that delay or additional cost is involved because of such action by the Owner, the Design-Builder shall make a Claim as provided in Article 14.

§ 5.13.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Design-Builder" in the Design-Build Documents in each case shall mean the individual or entity that executes each separate agreement with the Owner.

§ 5.13.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces, and of each separate contractor, with the Work of the Design-Builder, who shall cooperate with them. The Design-Builder shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Design-Builder shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Design-Builder, separate contractors and the Owner until subsequently revised.

§ 5.13.1.4 Unless otherwise provided in the Design-Build Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or separate contractors, the Owner shall be deemed to be subject to the same obligations, and to have the same rights, that apply to the Design-Builder under the Contract.

§ 5.14 Mutual Responsibility

§ 5.14.1 The Design-Builder shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Design-Builder's construction and operations with theirs as required by the Design-Build Documents.

§ 5.14.2 If part of the Design-Builder's Work depends upon construction or operations by the Owner or a separate contractor, the Design-Builder shall, prior to proceeding with that portion of the Work, prepare a written report to the Owner, identifying apparent discrepancies or defects in the construction or operations by the Owner or separate contractor that would render it unsuitable for proper execution and results of the Design-Builder's Work. Failure of the Design-Builder to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Design-Builder's Work, except as to defects not then reasonably discoverable.

§ 5.14.3 The Design-Builder shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Design-Builder's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Design-Builder for costs the Design-Builder incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 5.14.4 The Design-Builder shall promptly remedy damage the Design-Builder wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 5.14.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching the Work as the Design-Builder has with respect to the construction of the Owner or separate contractors in Section 5.10.

§ 5.15 Owner's Right to Clean Up

If a dispute arises among the Design-Builder, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and will allocate the cost among those responsible.

ARTICLE 6 CHANGES IN THE WORK

§ 6.1 General

§ 6.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order or Change Directive, subject to the limitations stated in this Article 6 and elsewhere in the Design-Build Documents.

§ 6.1.2 A Change Order shall be based upon agreement between the Owner and Design-Builder. The Owner may issue a Change Directive without agreement by the Design-Builder.

§ 6.1.3 Changes in the Work shall be performed under applicable provisions of the Design-Build Documents, and the Design-Builder shall proceed promptly, unless otherwise provided in the Change Order or Change Directive.

§ 6.2 Change Orders

A Change Order is a written instrument signed by the Owner and Design-Builder stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum or, if prior to execution of the Design-Build Amendment, the adjustment in the Design-Builder's compensation; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 6.3 Change Directives

§ 6.3.1 A Change Directive is a written order signed by the Owner directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or, if prior to execution of the Design-Build Amendment, the adjustment in the Design-Builder's compensation, or Contract Time. The Owner may by Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum or, if prior to execution of the Design-Build Amendment, the adjustment in the Design-Builder's compensation, and Contract Time being adjusted accordingly.

§ 6.3.2 A Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 6.3.3 If the Change Directive provides for an adjustment to the Contract Sum or, if prior to execution of the Design-Build Amendment, an adjustment in the Design-Builder's compensation, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Design-Build Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 6.3.7.

§ 6.3.4 If unit prices are stated in the Design-Build Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Design-Builder, the applicable unit prices shall be equitably adjusted.

§ 6.3.5 Upon receipt of a Change Directive, the Design-Builder shall promptly proceed with the change in the Work involved and advise the Owner of the Design-Builder's agreement or disagreement with the method, if any, provided in the Change Directive for determining the proposed adjustment in the Contract Sum or, if prior to execution of the Design-Build Amendment, the adjustment in the Design-Builder's compensation, or Contract Time.

§ 6.3.6 A Change Directive signed by the Design-Builder indicates the Design-Builder's agreement therewith, including adjustment in Contract Sum or, if prior to execution of the Design-Build Amendment, the adjustment in the Design-Builder's compensation, and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 6.3.7 If the Design-Builder does not respond promptly or disagrees with the method for adjustment in the Contract Sum or, if prior to execution of the Design-Build Amendment, the method for adjustment in the Design-Builder's compensation, the Owner shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 6.3.3.3, the Design-Builder shall keep and present, in such form as the Owner may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Design-Build Documents, costs for the purposes of this Section 6.3.7 shall be limited to the following:

- .1 Additional costs of professional services;
- .2 Costs of labor, including social security, unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .3 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .4 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Design-Builder or others;
- .5 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .6 Additional costs of supervision and field office personnel directly attributable to the change.

§ 6.3.8 The amount of credit to be allowed by the Design-Builder to the Owner for a deletion or change that results in a net decrease in the Contract Sum or, if prior to execution of the Design-Build Amendment, in the Design-Builder's compensation, shall be actual net cost. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 6.3.9 Pending final determination of the total cost of a Change Directive to the Owner, the Design-Builder may request payment for Work completed under the Change Directive in Applications for Payment. The Owner will make an interim determination for purposes of certification for payment for those costs deemed to be reasonably justified. The Owner's interim determination of cost shall adjust the Contract Sum or, if prior to execution of the Design-Build

Amendment, the Design-Builder's compensation, on the same basis as a Change Order, subject to the right of Design-Builder to disagree and assert a Claim in accordance with Article 14.

§ 6.3.10 When the Owner and Design-Builder agree with a determination concerning the adjustments in the Contract Sum or, if prior to execution of the Design-Build Amendment, the adjustment in the Design-Builder's compensation and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Owner and Design-Builder shall execute a Change Order. Change Orders may be issued for all or any part of a Change Directive.

ARTICLE 7 OWNER'S RESPONSIBILITIES

§ 7.1 General

§ 7.1.1 The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all Project matters requiring the Owner's approval or authorization.

§ 7.1.2 The Owner shall render decisions in a timely manner and in accordance with the Design-Builder's schedule agreed to by the Owner. The Owner shall furnish to the Design-Builder, within 15 days after receipt of a written request, information necessary and relevant for the Design-Builder to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 7.2 Information and Services Required of the Owner

§ 7.2.1 The Owner shall furnish information or services required of the Owner by the Design-Build Documents with reasonable promptness.

§ 7.2.2 The Owner shall provide, to the extent under the Owner's control and if not required by the Design-Build Documents to be provided by the Design-Builder, the results and reports of prior tests, inspections or investigations conducted for the Project involving structural or mechanical systems; chemical, air and water pollution; hazardous materials; or environmental and subsurface conditions and information regarding the presence of pollutants at the Project site. Upon receipt of a written request from the Design-Builder, the Owner shall also provide surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site under the Owner's control.

§ 7.2.3 The Owner shall promptly obtain easements, zoning variances, and legal authorizations or entitlements regarding site utilization where essential to the execution of the Project.

§ 7.2.4 The Owner shall cooperate with the Design-Builder in securing building and other permits, licenses and inspections.

§ 7.2.5 The services, information, surveys and reports required to be provided by the Owner under this Agreement, shall be furnished at the Owner's expense, and except as otherwise specifically provided in this Agreement or elsewhere in the Design-Build Documents or to the extent the Owner advises the Design-Builder to the contrary in writing, the Design-Builder shall be entitled to rely upon the accuracy and completeness thereof. In no event shall the Design-Builder be relieved of its responsibility to exercise proper precautions relating to the safe performance of the Work.

§ 7.2.6 If the Owner observes or otherwise becomes aware of a fault or defect in the Work or non-conformity with the Design-Build Documents, the Owner shall give prompt written notice thereof to the Design-Builder.

§ 7.2.7 Prior to the execution of the Design-Build Amendment, the Design-Builder may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Design-Build Documents and the Design-Builder's Proposal. Thereafter, the Design-Builder may only request such evidence if (1) the Owner fails to make payments to the Design-Builder as the Design-Build Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Design-Builder identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Design-Builder.

§ 7.2.8 Except as otherwise provided in the Design-Build Documents or when direct communications have been specially authorized, the Owner shall communicate through the Design-Builder with persons or entities employed or retained by the Design-Builder.

§ 7.2.9 Unless required by the Design-Build Documents to be provided by the Design-Builder, the Owner shall, upon request from the Design-Builder, furnish the services of geotechnical engineers or other consultants for investigation of subsurface, air and water conditions when such services are reasonably necessary to properly carry out the design services furnished by the Design-Builder. In such event, the Design-Builder shall specify the services required. Such services may include, but are not limited to, test borings, test pits, determinations of soil bearing values, percolation tests, evaluations of hazardous materials, ground corrosion and resistivity tests, and necessary operations for anticipating subsoil conditions. The services of geotechnical engineer(s) or other consultants shall include preparation and submission of all appropriate reports and professional recommendations.

§ 7.2.10 The Owner shall purchase and maintain insurance as set forth in Exhibit B.

§ 7.3 Submittals

§ 7.3.1 The Owner shall review and approve or take other appropriate action on Submittals. Review of Submittals is not conducted for the purpose of determining the accuracy and completeness of other details, such as dimensions and quantities; or for substantiating instructions for installation or performance of equipment or systems; or for determining that the Submittals are in conformance with the Design-Build Documents, all of which remain the responsibility of the Design-Builder as required by the Design-Build Documents. The Owner's action will be taken in accordance with the submittal schedule approved by the Owner or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Owner's judgment to permit adequate review. The Owner's review of Submittals shall not relieve the Design-Builder of the obligations under Sections 3.1.11, 3.1.12, and 5.2.3. The Owner's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Owner, of any construction means, methods, techniques, sequences or procedures. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 7.3.2 Upon review of the Submittals required by the Design-Build Documents, the Owner shall notify the Design-Builder of any non-conformance with the Design-Build Documents the Owner discovers.

§ 7.4 Visits to the site by the Owner shall not be construed to create an obligation on the part of the Owner to make on-site inspections to check the quality or quantity of the Work. The Owner shall neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, because these are solely the Design-Builder's rights and responsibilities under the Design-Build Documents.

§ 7.5 The Owner shall not be responsible for the Design-Builder's failure to perform the Work in accordance with the requirements of the Design-Build Documents. The Owner shall not have control over or charge of, and will not be responsible for acts or omissions of the Design-Builder, Architect, Consultants, Contractors, or their agents or employees, or any other persons or entities performing portions of the Work for the Design-Builder.

§ 7.6 The Owner has the authority to reject Work that does not conform to the Design-Build Documents. The Owner shall have authority to require inspection or testing of the Work in accordance with Section 15.5.2, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Owner nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Owner to the Design-Builder, the Architect, Consultants, Contractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 7.7 The Owner shall determine the date or dates of Substantial Completion in accordance with Section 9.8 and the date of final completion in accordance with Section 9.10.

§ 7.8 Owner's Right to Stop Work

If the Design-Builder fails to correct Work which is not in accordance with the requirements of the Design-Build Documents as required by Section 11.2 or persistently fails to carry out Work in accordance with the Design-Build Documents, the Owner may issue a written order to the Design-Builder to stop the Work, or any portion thereof, until

the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Design-Builder or any other person or entity, except to the extent required by Section 5.13.1.3.

§ 7.9 Owner's Right to Carry Out the Work

If the Design-Builder defaults or neglects to carry out the Work in accordance with the Design-Build Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Design-Builder the reasonable cost of correcting such deficiencies. If payments then or thereafter due the Design-Builder are not sufficient to cover such amounts, the Design-Builder shall pay the difference to the Owner.

ARTICLE 8 TIME

§ 8.1 Progress and Completion

§ 8.1.1 Time limits stated in the Design-Build Documents are of the essence of the Contract. By executing the Design-Build Amendment the Design-Builder confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.1.2 The Design-Builder shall not, except by agreement of the Owner in writing, commence the Work prior to the effective date of insurance, other than property insurance, required by this Contract. The Contract Time shall not be adjusted as a result of the Design-Builder's failure to obtain insurance required under this Contract.

§ 8.1.3 The Design-Builder shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.2 Delays and Extensions of Time

§ 8.2.1 If the Design-Builder is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or of a consultant or separate contractor employed by the Owner; or by changes ordered in the Work by the Owner; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Design-Builder's control; or by delay authorized by the Owner pending mediation and binding dispute resolution or by other causes that the Owner determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine.

§ 8.2.2 Claims relating to time shall be made in accordance with applicable provisions of Article 14.

§ 8.2.3 This Section 8.2 does not preclude recovery of damages for delay by either party under other provisions of the Design-Build Documents.

ARTICLE 9 PAYMENT APPLICATIONS AND PROJECT COMPLETION

§ 9.1 Contract Sum

The Contract Sum is stated in the Design-Build Amendment.

§ 9.2 Schedule of Values

Where the Contract Sum is based on a stipulated sum or Guaranteed Maximum Price, the Design-Builder, prior to the first Application for Payment after execution of the Design-Build Amendment shall submit to the Owner a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used as a basis for reviewing the Design-Builder's Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Design-Builder shall submit to the Owner an itemized Application for Payment for completed portions of the Work. The application shall be notarized, if required, and supported by data substantiating the Design-Builder's right to payment as the Owner may require, such as copies of requisitions from the Architect, Consultants, Contractors, and material suppliers, and shall reflect retainage if provided for in the Design-Build Documents.

§ 9.3.1.1 As provided in Section 6.3.9, Applications for Payment may include requests for payment on account of changes in the Work that have been properly authorized by Change Directives, or by interim determinations of the Owner, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Design-Builder does not intend to pay the Architect, Consultant, Contractor, material supplier, or other persons or entities providing services or work for the Design-Builder, unless such Work has been performed by others whom the Design-Builder intends to pay.

§ 9.3.2 Unless otherwise provided in the Design-Build Documents, payments shall be made for services provided as well as materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Design-Builder with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Design-Builder warrants that title to all Work, other than Instruments of Service, covered by an Application for Payment will pass to the Owner no later than the time of payment. The Design-Builder further warrants that, upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Design-Builder's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Design-Builder, Architect, Consultants, Contractors, material suppliers, or other persons or entities entitled to make a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 Certificates for Payment

The Owner shall, within seven days after receipt of the Design-Builder's Application for Payment, issue to the Design-Builder a Certificate for Payment indicating the amount the Owner determines is properly due, and notify the Design-Builder in writing of the Owner's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Owner may withhold a Certificate for Payment in whole or in part to the extent reasonably necessary to protect the Owner due to the Owner's determination that the Work has not progressed to the point indicated in the Design-Builder's Application for Payment, or the quality of the Work is not in accordance with the Design-Build Documents. If the Owner is unable to certify payment in the amount of the Application, the Owner will notify the Design-Builder as provided in Section 9.4. If the Design-Builder and Owner cannot agree on a revised amount, the Owner will promptly issue a Certificate for Payment for the amount that the Owner deems to be due and owing. The Owner may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued to such extent as may be necessary to protect the Owner from loss for which the Design-Builder is responsible because of

- 1 defective Work, including design and construction, not remedied;
- 2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Design-Builder;
- 3 failure of the Design-Builder to make payments properly to the Architect, Consultants, Contractors or others, for services, labor, materials or equipment;
- 4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- 5 damage to the Owner or a separate contractor;
- 6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- 7 repeated failure to carry out the Work in accordance with the Design-Build Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Owner withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Design-Builder and to the Architect or any Consultants, Contractor, material or equipment

suppliers, or other persons or entities providing services or work for the Design-Builder to whom the Design-Builder failed to make payment for Work properly performed or material or equipment suitably delivered.

§ 9.6 Progress Payments

§ 9.6.1 After the Owner has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Design-Build Documents.

§ 9.6.2 The Design-Builder shall pay each Architect, Consultant, Contractor, and other person or entity providing services or work for the Design-Builder no later than the time period required by applicable law, but in no event more than seven days after receipt of payment from the Owner the amount to which the Architect, Consultant, Contractor, and other person or entity providing services or work for the Design-Builder is entitled, reflecting percentages actually retained from payments to the Design-Builder on account of the portion of the Work performed by the Architect, Consultant, Contractor, or other person or entity. The Design-Builder shall, by appropriate agreement with each Architect, Consultant, Contractor, and other person or entity providing services or work for the Design-Builder, require each Architect, Consultant, Contractor, and other person or entity providing services or work for the Design-Builder to make payments to subconsultants and subcontractors in a similar manner.

§ 9.6.3 The Owner will, on request and if practicable, furnish to the Architect, a Consultant, Contractor, or other person or entity providing services or work for the Design-Builder, information regarding percentages of completion or amounts applied for by the Design-Builder and action taken thereon by the Owner on account of portions of the Work done by such Architect, Consultant, Contractor or other person or entity providing services or work for the Design-Builder.

§ 9.6.4 The Owner has the right to request written evidence from the Design-Builder that the Design-Builder has properly paid the Architect, Consultants, Contractors, or other person or entity providing services or work for the Design-Builder, amounts paid by the Owner to the Design-Builder for the Work. If the Design-Builder fails to furnish such evidence within seven days, the Owner shall have the right to contact the Architect, Consultants, and Contractors to ascertain whether they have been properly paid. The Owner shall have no obligation to pay or to see to the payment of money to a Consultant or Contractor, except as may otherwise be required by law.

§ 9.6.5 Design-Builder payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Design-Build Documents.

§ 9.6.7 Unless the Design-Builder provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Design-Builder for Work properly performed by the Architect, Consultants, Contractors and other person or entity providing services or work for the Design-Builder, shall be held by the Design-Builder for the Architect and those Consultants, Contractors, or other person or entity providing services or work for the Design-Builder, for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Design-Builder, shall create any fiduciary liability or tort liability on the part of the Design-Builder for breach of trust or shall entitle any person or entity to an award of punitive damages against the Design-Builder for breach of the requirements of this provision.

§ 9.7 Failure of Payment

If the Owner does not issue a Certificate for Payment, through no fault of the Design-Builder, within the time required by the Design-Build Documents, then the Design-Builder may, upon seven additional days' written notice to the Owner, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Design-Builder's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Design-Build Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Design-Build Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion is the date certified by the Owner in accordance with this Section 9.8.

§ 9.8.2 When the Design-Builder considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Design-Builder shall prepare and submit to the Owner a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Design-Builder to complete all Work in accordance with the Design-Build Documents.

§ 9.8.3 Upon receipt of the Design-Builder's list, the Owner shall make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's inspection discloses any item, whether or not included on the Design-Builder's list, which is not sufficiently complete in accordance with the Design-Build Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Design-Builder shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Owner. In such case, the Design-Builder shall then submit a request for another inspection by the Owner to determine Substantial Completion.

§ 9.8.4 Prior to issuance of the Certificate of Substantial Completion under Section 9.8.5, the Owner and Design-Builder shall discuss and then determine the parties' obligations to obtain and maintain property insurance following issuance of the Certificate of Substantial Completion.

§ 9.8.5 When the Work or designated portion thereof is substantially complete, the Design-Builder will prepare for the Owner's signature a Certificate of Substantial Completion that shall, upon the Owner's signature, establish the date of Substantial Completion; establish responsibilities of the Owner and Design-Builder for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Design-Builder shall finish all items on the list accompanying the Certificate. Warranties required by the Design-Build Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.6 The Certificate of Substantial Completion shall be submitted by the Design-Builder to the Owner for written acceptance of responsibilities assigned to it in the Certificate. Upon the Owner's acceptance, and consent of surety, if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Design-Build Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Design-Builder, provided such occupancy or use is consented to, by endorsement or otherwise, by the insurer providing property insurance and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Design-Builder have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Design-Build Documents. When the Design-Builder considers a portion substantially complete, the Design-Builder shall prepare and submit a list to the Owner as provided under Section 9.8.2. Consent of the Design-Builder to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Design-Builder.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner and Design-Builder shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Design-Build Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Design-Builder's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner will promptly make such inspection. When the Owner finds the Work acceptable under the Design-Build Documents and the Contract fully performed, the Owner will, subject to Section 9.10.2, promptly issue a final Certificate for Payment.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Design-Builder submits to the Owner (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work, for which the Owner or the Owner's property might be responsible or encumbered, (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Design-Build Documents to remain in force after final payment is currently in effect, (3) a written statement that the Design-Builder knows of no substantial reason that the insurance will not be renewable to cover the period required by the Design-Build Documents, (4) consent of surety, if any, to final payment, (5) as-constructed record copy of the Construction Documents marked to indicate field changes and selections made during construction, (6) manufacturer's warranties, product data, and maintenance and operations manuals, and (7) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, or releases and waivers of liens, claims, security interests, or encumbrances, arising out of the Contract, to the extent and in such form as may be designated by the Owner. If an Architect, a Consultant, or a Contractor, or other person or entity providing services or work for the Design-Builder, refuses to furnish a release or waiver required by the Owner, the Design-Builder may furnish a bond satisfactory to the Owner to indemnify the Owner against such liens, claims, security interests, or encumbrances. If such liens, claims, security interests, or encumbrances remains unsatisfied after payments are made, the Design-Builder shall refund to the Owner all money that the Owner may be compelled to pay in discharging such liens, claims, security interests, or encumbrances, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Design-Builder or by issuance of Change Orders affecting final completion, the Owner shall, upon application by the Design-Builder, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Design-Build Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Design-Builder to the Owner prior to issuance of payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Design-Build Documents; or
- .3 terms of special warranties required by the Design-Build Documents.

§ 9.10.5 Acceptance of final payment by the Design-Builder shall constitute a waiver of claims by the Design-Builder except those previously made in writing and identified by the Design-Builder as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Design-Builder shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Design-Builder shall be responsible for precautions for the safety of, and reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Design-Builder or the Architect, Consultants, or Contractors, or other person or entity providing services or work for the Design-Builder; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, or structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Design-Builder shall comply with, and give notices required by, applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property, or their protection from damage, injury or loss.

§ 10.2.3 The Design-Builder shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notify owners and users of adjacent sites and utilities of the safeguards and protections.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods, are necessary for execution of the Work, the Design-Builder shall exercise utmost care, and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Design-Builder shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Design-Build Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3, caused in whole or in part by the Design-Builder, the Architect, a Consultant, a Contractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Design-Builder is responsible under Sections 10.2.1.2 and 10.2.1.3; except damage or loss attributable to acts or omissions of the Owner, or anyone directly or indirectly employed by the Owner, or by anyone for whose acts the Owner may be liable, and not attributable to the fault or negligence of the Design-Builder. The foregoing obligations of the Design-Builder are in addition to the Design-Builder's obligations under Section 3.1.14.

§ 10.2.6 The Design-Builder shall designate a responsible member of the Design-Builder's organization, at the site, whose duty shall be the prevention of accidents. This person shall be the Design-Builder's superintendent unless otherwise designated by the Design-Builder in writing to the Owner.

§ 10.2.7 The Design-Builder shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property. If the Owner or Design-Builder suffers injury or damage to person or property because of an act or omission of the other, or of others for whose acts such party is legally responsible, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials

§ 10.3.1 The Design-Builder is responsible for compliance with any requirements included in the Design-Build Documents regarding hazardous materials. If the Design-Builder encounters a hazardous material or substance not addressed in the Design-Build Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Design-Builder, the Design-Builder shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner in writing.

§ 10.3.2 Upon receipt of the Design-Builder's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Design-Builder and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Design-Build Documents, the Owner shall furnish in writing to the Design-Builder the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Design-Builder will promptly reply to the Owner in writing stating whether or not the Design-Builder has reasonable objection to the persons or entities proposed by the Owner. If the Design-Builder has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Design-Builder has no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Design-Builder. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Design-Builder's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Design-Builder, the Architect, Consultants, and Contractors, and employees of any of them, from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area, if in fact the material or substance presents the risk of bodily injury or death as described in

Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to, or destruction of, tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Design-Builder brings to the site unless such materials or substances are required by the Owner's Criteria. The Owner shall be responsible for materials or substances required by the Owner's Criteria, except to the extent of the Design-Builder's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Design-Builder shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Design-Builder brings to the site and negligently handles, or (2) where the Design-Builder fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Design-Builder, the Design-Builder is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Design-Build Documents, the Owner shall indemnify the Design-Builder for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Design-Builder shall act, at the Design-Builder's discretion, to prevent threatened damage, injury or loss.

ARTICLE 11 UNCOVERING AND CORRECTION OF WORK

§ 11.1 Uncovering of Work

The Owner may request to examine a portion of the Work that the Design-Builder has covered to determine if the Work has been performed in accordance with the Design-Build Documents. If such Work is in accordance with the Design-Build Documents, the Owner and Design-Builder shall execute a Change Order to adjust the Contract Time and Contract Sum, as appropriate. If such Work is not in accordance with the Design-Build Documents, the costs of uncovering and correcting the Work shall be at the Design-Builder's expense and the Design-Builder shall not be entitled to a change in the Contract Time unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs and the Contract Time will be adjusted as appropriate.

§ 11.2 Correction of Work

§ 11.2.1 Before or After Substantial Completion. The Design-Builder shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Design-Build Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for any design consultant employed by the Owner whose expenses and compensation were made necessary thereby, shall be at the Design-Builder's expense.

§ 11.2.2 After Substantial Completion

§ 11.2.2.1 In addition to the Design-Builder's obligations under Section 3.1.12, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Design-Build Documents, any of the Work is found not to be in accordance with the requirements of the Design-Build Documents, the Design-Builder shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Design-Builder a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of the Work, if the Owner fails to notify the Design-Builder and give the Design-Builder an opportunity to make the correction, the Owner waives the rights to require correction by the Design-Builder and to make a claim for breach of warranty. If the Design-Builder fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, the Owner may correct it in accordance with Section 7.9.

§ 11.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 11.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Design-Builder pursuant to this Section 11.2.

§ 11.2.3 The Design-Builder shall remove from the site portions of the Work that are not in accordance with the requirements of the Design-Build Documents and are neither corrected by the Design-Builder nor accepted by the Owner.

§ 11.2.4 The Design-Builder shall bear the cost of correcting destroyed or damaged construction of the Owner or separate contractors, whether completed or partially completed, caused by the Design-Builder's correction or removal of Work that is not in accordance with the requirements of the Design-Build Documents.

§ 11.2.5 Nothing contained in this Section 11.2 shall be construed to establish a period of limitation with respect to other obligations the Design-Builder has under the Design-Build Documents. Establishment of the one-year period for correction of Work as described in Section 11.2.2 relates only to the specific obligation of the Design-Builder to correct the Work, and has no relationship to the time within which the obligation to comply with the Design-Build Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Design-Builder's liability with respect to the Design-Builder's obligations other than specifically to correct the Work.

§ 11.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Design-Build Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 12 COPYRIGHTS AND LICENSES

§ 12.1 Drawings, specifications, and other documents furnished by the Design-Builder, including those in electronic form, are Instruments of Service. The Design-Builder, and the Architect, Consultants, Contractors, and any other person or entity providing services or work for any of them, shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and shall retain all common law, statutory and other reserved rights, including copyrights. Submission or distribution of Instruments of Service to meet official regulatory requirements, or for similar purposes in connection with the Project, is not to be construed as publication in derogation of the reserved rights of the Design-Builder and the Architect, Consultants, and Contractors, and any other person or entity providing services or work for any of them.

§ 12.2 The Design-Builder and the Owner warrant that in transmitting Instruments of Service, or any other information, the transmitting party is the copyright owner of such information or has permission from the copyright owner to transmit such information for its use on the Project.

§ 12.3 Upon execution of the Agreement, the Design-Builder grants to the Owner a limited, irrevocable and non-exclusive license to use the Instruments of Service solely and exclusively for purposes of constructing, using, maintaining, altering and adding to the Project, provided that the Owner substantially performs its obligations, including prompt payment of all sums when due, under the Design-Build Documents. The license granted under this section permits the Owner to authorize its consultants and separate contractors to reproduce applicable portions of the Instruments of Service solely and exclusively for use in performing services or construction for the Project. If the Design-Builder rightfully terminates this Agreement for cause as provided in Section 13.1.4 or 13.2.1 the license granted in this Section 12.3 shall terminate.

§ 12.3.1 The Design-Builder shall obtain non-exclusive licenses from the Architect, Consultants, and Contractors, that will allow the Design-Builder to satisfy its obligations to the Owner under this Article 12. The Design-Builder's licenses from the Architect and its Consultants and Contractors shall also allow the Owner, in the event this Agreement is terminated for any reason other than the default of the Owner or in the event the Design-Builder's Architect, Consultants, or Contractors terminate their agreements with the Design-Builder for cause, to obtain a limited, irrevocable and non-exclusive license solely and exclusively for purposes of constructing, using, maintaining,

altering and adding to the Project, provided that the Owner (1) agrees to pay to the Architect, Consultant or Contractor all amounts due, and (2) provide the Architect, Consultant or Contractor with the Owner's written agreement to indemnify and hold harmless the Architect, Consultant or Contractor from all costs and expenses, including the cost of defense, related to claims and causes of action asserted by any third person or entity to the extent such costs and expenses arise from the Owner's alteration or use of the Instruments of Service.

§ 12.3.2 In the event the Owner alters the Instruments of Service without the author's written authorization or uses the Instruments of Service without retaining the authors of the Instruments of Service, the Owner releases the Design-Builder, Architect, Consultants, Contractors and any other person or entity providing services or work for any of them, from all claims and causes of action arising from or related to such uses. The Owner, to the extent permitted by law, further agrees to indemnify and hold harmless the Design-Builder, Architect, Consultants, Contractors and any other person or entity providing services or work for any of them, from all costs and expenses, including the cost of defense, related to claims and causes of action asserted by any third person or entity to the extent such costs and expenses arise from the Owner's alteration or use of the Instruments of Service under this Section 12.3.2. The terms of this Section 12.3.2 shall not apply if the Owner rightfully terminates this Agreement for cause under Sections 13.1.4 or 13.2.2.

ARTICLE 13 TERMINATION OR SUSPENSION

§ 13.1 Termination or Suspension Prior to Execution of the Design-Build Amendment

§ 13.1.1 If the Owner fails to make payments to the Design-Builder for Work prior to execution of the Design-Build Amendment in accordance with this Agreement, such failure shall be considered substantial nonperformance and cause for termination or, at the Design-Builder's option, cause for suspension of performance of services under this Agreement. If the Design-Builder elects to suspend the Work, the Design-Builder shall give seven days' written notice to the Owner before suspending the Work. In the event of a suspension of the Work, the Design-Builder shall have no liability to the Owner for delay or damage caused by the suspension of the Work. Before resuming the Work, the Design-Builder shall be paid all sums due prior to suspension and any expenses incurred in the interruption and resumption of the Design-Builder's Work. The Design-Builder's compensation for, and time to complete, the remaining Work shall be equitably adjusted.

§ 13.1.2 If the Owner suspends the Project, the Design-Builder shall be compensated for the Work performed prior to notice of such suspension. When the Project is resumed, the Design-Builder shall be compensated for expenses incurred in the interruption and resumption of the Design-Builder's Work. The Design-Builder's compensation for, and time to complete, the remaining Work shall be equitably adjusted.

§ 13.1.3 If the Owner suspends the Project for more than 90 cumulative days for reasons other than the fault of the Design-Builder, the Design-Builder may terminate this Agreement by giving not less than seven days' written notice.

§ 13.1.4 Either party may terminate this Agreement upon not less than seven days' written notice should the other party fail substantially to perform in accordance with the terms of this Agreement through no fault of the party initiating the termination.

§ 13.1.5 The Owner may terminate this Agreement upon not less than seven days' written notice to the Design-Builder for the Owner's convenience and without cause.

§ 13.1.6 In the event of termination not the fault of the Design-Builder, the Design-Builder shall be compensated for Work performed prior to termination, together with Reimbursable Expenses then due and any other expenses directly attributable to termination for which the Design-Builder is not otherwise compensated. In no event shall the Design-Builder's compensation under this Section 13.1.6 be greater than the compensation set forth in Section 2.1.

§ 13.2 Termination or Suspension Following Execution of the Design-Build Amendment

§ 13.2.1 Termination by the Design-Builder

§ 13.2.1.1 The Design-Builder may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Design-Builder, the Architect, a Consultant, or a Contractor, or their agents or employees, or any other persons or entities performing portions of the Work under direct or indirect contract with the Design-Builder, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- .3 Because the Owner has not issued a Certificate for Payment and has not notified the Design-Builder of the reason for withholding certification as provided in Section 9.5.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Design-Build Documents; or
- .4 The Owner has failed to furnish to the Design-Builder promptly, upon the Design-Builder's request, reasonable evidence as required by Section 7.2.7.

§ 13.2.1.2 The Design-Builder may terminate the Contract if, through no act or fault of the Design-Builder, the Architect, a Consultant, a Contractor, or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Design-Builder, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 13.2.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 13.2.1.3 If one of the reasons described in Section 13.2.1.1 or 13.2.1.2 exists, the Design-Builder may, upon seven days' written notice to the Owner, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 13.2.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Design-Builder or any other persons or entities performing portions of the Work under contract with the Design-Builder because the Owner has repeatedly failed to fulfill the Owner's obligations under the Design-Build Documents with respect to matters important to the progress of the Work, the Design-Builder may, upon seven additional days' written notice to the Owner, terminate the Contract and recover from the Owner as provided in Section 13.2.1.3.

§ 13.2.2 Termination by the Owner For Cause

§ 13.2.2.1 The Owner may terminate the Contract if the Design-Builder

- .1 fails to submit the Proposal by the date required by this Agreement, or if no date is indicated, within a reasonable time consistent with the date of Substantial Completion;
- .2 repeatedly refuses or fails to supply an Architect, or enough properly skilled Consultants, Contractors, or workers or proper materials;
- .3 fails to make payment to the Architect, Consultants, or Contractors for services, materials or labor in accordance with their respective agreements with the Design-Builder;
- .4 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .5 is otherwise guilty of substantial breach of a provision of the Design-Build Documents.

§ 13.2.2.2 When any of the above reasons exist, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Design-Builder and the Design-Builder's surety, if any, seven days' written notice, terminate employment of the Design-Builder and may, subject to any prior rights of the surety:

- .1 Exclude the Design-Builder from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Design-Builder;
- .2 Accept assignment of the Architect, Consultant and Contractor agreements pursuant to Section 3.1.15; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Design-Builder, the Owner shall furnish to the Design-Builder a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 13.2.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 13.2.2.1, the Design-Builder shall not be entitled to receive further payment until the Work is finished.

§ 13.2.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Design-Builder. If such costs and damages exceed the unpaid balance, the Design-Builder shall pay the difference to the Owner. The obligation for such payments shall survive termination of the Contract.

§ 13.2.3 Suspension by the Owner for Convenience

§ 13.2.3.1 The Owner may, without cause, order the Design-Builder in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 13.2.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 13.2.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Design-Builder is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 13.2.4 Termination by the Owner for Convenience

§ 13.2.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 13.2.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Design-Builder shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and,
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Project agreements, including agreements with the Architect, Consultants, Contractors, and purchase orders, and enter into no further Project agreements and purchase orders.

§ 13.2.4.3 In case of such termination for the Owner's convenience, the Design-Builder shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 14 CLAIMS AND DISPUTE RESOLUTION

§ 14.1 Claims

§ 14.1.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Design-Builder arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 14.1.2 Time Limits on Claims. The Owner and Design-Builder shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other, arising out of or related to the Contract in accordance with the requirements of the binding dispute resolution method selected in Section 1.3, within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Design-Builder waive all claims and causes of action not commenced in accordance with this Section 14.1.2.

§ 14.1.3 Notice of Claims

§ 14.1.3.1 Prior To Final Payment. Prior to Final Payment, Claims by either the Owner or Design-Builder must be initiated by written notice to the other party within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 14.1.3.2 Claims Arising After Final Payment. After Final Payment, Claims by either the Owner or Design-Builder that have not otherwise been waived pursuant to Sections 9.10.4 or 9.10.5, must be initiated by prompt written notice to the other party. The notice requirement in Section 14.1.3.1 and the Initial Decision requirement as a condition precedent to mediation in Section 14.2.1 shall not apply.

§ 14.1.4 Continuing Contract Performance. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 13, the Design-Builder shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Design-Build Documents.

§ 14.1.5 Claims for Additional Cost. If the Design-Builder intends to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the portion of the Work that relates to the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 14.1.6 Claims for Additional Time

§ 14.1.6.1 If the Design-Builder intends to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Design-Builder's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 14.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 14.1.7 Claims for Consequential Damages

The Design-Builder and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Design-Builder for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 13. Nothing contained in this Section 14.1.7 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Design-Build Documents.

§ 14.2 Initial Decision

§ 14.2.1 An initial decision shall be required as a condition precedent to mediation of all Claims between the Owner and Design-Builder initiated prior to the date final payment is due, excluding those arising under Sections 10.3 and 10.4 of the Agreement and Sections B.3.2.9 and B.3.2.10 of Exhibit B to this Agreement, unless 30 days have passed after the Claim has been initiated with no decision having been rendered. Unless otherwise mutually agreed in writing, the Owner shall render the initial decision on Claims.

§ 14.2.2 Procedure

§ 14.2.2.1 Claims Initiated by the Owner. If the Owner initiates a Claim, the Design-Builder shall provide a written response to Owner within ten days after receipt of the notice required under Section 14.1.3.1. Thereafter, the Owner shall render an initial decision within ten days of receiving the Design-Builder's response: (1) withdrawing the Claim in whole or in part, (2) approving the Claim in whole or in part, or (3) suggesting a compromise.

§ 14.2.2.2 Claims Initiated by the Design-Builder. If the Design-Builder initiates a Claim, the Owner will take one or more of the following actions within ten days after receipt of the notice required under Section 14.1.3.1: (1) request additional supporting data, (2) render an initial decision rejecting the Claim in whole or in part, (3) render an initial decision approving the Claim, (4) suggest a compromise or (5) indicate that it is unable to render an initial decision because the Owner lacks sufficient information to evaluate the merits of the Claim.

§ 14.2.3 In evaluating Claims, the Owner may, but shall not be obligated to, consult with or seek information from persons with special knowledge or expertise who may assist the Owner in rendering a decision. The retention of such persons shall be at the Owner's expense.

§ 14.2.4 If the Owner requests the Design-Builder to provide a response to a Claim or to furnish additional supporting data, the Design-Builder shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Owner when the response or supporting data will be furnished or (3) advise the Owner that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Owner will either reject or approve the Claim in whole or in part.

§ 14.2.5 The Owner's initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) identify any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 14.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 14.2.6.1.

§ 14.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 14.2.7 In the event of a Claim against the Design-Builder, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Design-Builder's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 14.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 14.3 Mediation

§ 14.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 14.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 14.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration proceeding is stayed pursuant to this Section 14.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 14.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction.

§ 14.4 Arbitration

§ 14.4.1 If the parties have selected arbitration as the method for binding dispute resolution in Section 1.3, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 14.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations or statute of repose. For statute of limitations or statute of repose purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 14.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction.

§ 14.4.3 The foregoing agreement to arbitrate, and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 14.4.4 Consolidation or Joinder

§ 14.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration

permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 14.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 14.4.4.3 The Owner and Design-Builder grant to any person or entity made a party to an arbitration conducted under this Section 14.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Design-Builder under this Agreement.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 14.4.

§ 15.2 Successors and Assigns

§ 15.2.1 The Owner and Design-Builder, respectively, bind themselves, their partners, successors, assigns and legal representatives to the covenants, agreements and obligations contained in the Design-Build Documents. Except as provided in Section 15.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 15.2.2 The Owner may, without consent of the Design-Builder, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Design-Build Documents. The Design-Builder shall execute all consents reasonably required to facilitate such assignment.

§ 15.2.3 If the Owner requests the Design-Builder, Architect, Consultants, or Contractors to execute certificates, other than those required by Section 3.1.10, the Owner shall submit the proposed language of such certificates for review at least 14 days prior to the requested dates of execution. If the Owner requests the Design-Builder, Architect, Consultants, or Contractors to execute consents reasonably required to facilitate assignment to a lender, the Design-Builder, Architect, Consultants, or Contractors shall execute all such consents that are consistent with this Agreement, provided the proposed consent is submitted to them for review at least 14 days prior to execution. The Design-Builder, Architect, Consultants, and Contractors shall not be required to execute certificates or consents that would require knowledge, services or responsibilities beyond the scope of their services.

§ 15.3 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 15.4 Rights and Remedies

§ 15.4.1 Duties and obligations imposed by the Design-Build Documents, and rights and remedies available thereunder, shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 15.4.2 No action or failure to act by the Owner or Design-Builder shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

§ 15.5 Tests and Inspections

§ 15.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Design-Build Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Design-Builder shall make arrangements for such tests, inspections and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Design-Builder shall give the Owner timely notice of when and where tests and inspections are to be made so that the Owner may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Design-Builder.

§ 15.5.2 If the Owner determines that portions of the Work require additional testing, inspection or approval not included under Section 15.5.1, the Owner will instruct the Design-Builder to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Design-Builder shall give timely notice to the Owner of when and where tests and inspections are to be made so that the Owner may be present for such procedures. Such costs, except as provided in Section 15.5.3, shall be at the Owner's expense.

§ 15.5.3 If such procedures for testing, inspection or approval under Sections 15.5.1 and 15.5.2 reveal failure of the portions of the Work to comply with requirements established by the Design-Build Documents, all costs made necessary by such failure shall be at the Design-Builder's expense.

§ 15.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Design-Build Documents, be secured by the Design-Builder and promptly delivered to the Owner.

§ 15.5.5 If the Owner is to observe tests, inspections or approvals required by the Design-Build Documents, the Owner will do so promptly and, where practicable, at the normal place of testing.

§ 15.5.6 Tests or inspections conducted pursuant to the Design-Build Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 15.6 Confidential Information

If the Owner or Design-Builder transmits Confidential Information, the transmission of such Confidential Information constitutes a warranty to the party receiving such Confidential Information that the transmitting party is authorized to transmit the Confidential Information. If a party receives Confidential Information, the receiving party shall keep the Confidential Information strictly confidential and shall not disclose it to any other person or entity except as set forth in Section 15.6.1.

§ 15.6.1 A party receiving Confidential Information may disclose the Confidential Information as required by law or court order, including a subpoena or other form of compulsory legal process issued by a court or governmental entity. A party receiving Confidential Information may also disclose the Confidential Information to its employees, consultants or contractors in order to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Confidential Information as set forth in this Contract.

§ 15.7 Capitalization

Terms capitalized in the Contract include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 15.8 Interpretation

§ 15.8.1 In the interest of brevity the Design-Build Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 15.8.2 Unless otherwise stated in the Design-Build Documents, words which have well-known technical or construction industry meanings are used in the Design-Build Documents in accordance with such recognized meanings.

ARTICLE 16 SCOPE OF THE AGREEMENT

§ 16.1 This Agreement is comprised of the following documents listed below:

- .1 AIA Document A141™–2014, Standard Form of Agreement Between Owner and Design-Builder
- .2 AIA Document A141™–2014, Exhibit C, Sustainable Projects, if completed

« »

.6 Other:

« »

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

« »« »

(Printed name and title)

DESIGN-BUILDER (Signature)

« »« »

(Printed name and title)



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DRAFT AIA® Document A141® – 2014

Exhibit B

Insurance and Bonds

for the following PROJECT:
(Name and location or address)

« »
« »

THE OWNER:
(Name, legal status and address)

« »« »
« »

THE DESIGN-BUILDER:
(Name, legal status and address)

« »« »
« »

THE AGREEMENT

This Insurance Exhibit is part of the accompanying agreement for the Project, between the Owner and the Design-Builder (hereinafter, the Agreement), dated the « » day of « » in the year « ».

(In words, indicate day, month and year.)

TABLE OF ARTICLES

- B.1 GENERAL
- B.2 DESIGN BUILDER'S INSURANCE AND BONDS
- B.3 OWNER'S INSURANCE
- B.4 SPECIAL TERMS AND CONDITIONS

ARTICLE B.1 GENERAL

The Owner and Design-Builder shall purchase and maintain insurance and provide bonds as set forth in this Exhibit B. Where a provision in this Exhibit conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Exhibit will prevail.

ARTICLE B.2 DESIGN BUILDER'S INSURANCE AND BONDS

§ B.2.1 The Design-Builder shall purchase and maintain the following types and limits of insurance from a company or companies lawfully authorized to do business in the jurisdiction where the Project is located. The Design-Builder shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 11.2.2.1 of the Agreement, unless a different duration is stated below:

(If the Design-Builder is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

§ B.2.1.1 Commercial General Liability with policy limits of not less than « » (\$ « ») for each occurrence and « » (\$ « ») in the aggregate providing coverage for claims including

- 1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- 2 personal injury;
- 3 damages because of injury to or destruction of tangible property;
- 4 bodily injury or property damage arising out of completed operations; and
- 5 contractual liability applicable to the Design-Builder's obligations under Section 3.1.14 of the Agreement.

§ B.2.1.2 Automobile Liability covering vehicles owned by the Design-Builder and non-owned vehicles used by the Design-Builder with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles specified in this Section B.2.1.2, along with any other statutorily required automobile coverage.

§ B.2.1.3 The Design-Builder may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess liability insurance, provided such primary and excess insurance policies result in the same or greater coverage as those required under Sections B.2.1.1 and B.2.1.2.

§ B.2.1.4 Workers' Compensation at statutory limits.

§ B.2.1.5 Employers' Liability with policy limits as provided below:

« »

§ B.2.1.6 Professional Liability covering negligent acts, errors and omissions in the performance of professional services, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ B.2.1.7 Pollution Liability covering performance of the Work, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ B.2.1.7.1 The Design-Builder may obtain a combined Professional Liability and Pollution Liability policy to satisfy the requirements set forth in Sections B.2.1.6 and B.2.1.7, with combined policy limits that are not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ B.2.1.8 The Design-Builder shall provide written notification to the Owner of the cancellation or expiration of any insurance required by this Article B.2. The Design-Builder shall provide such written notice within five (5) business days of the date the Design-Builder is first aware of the cancellation or expiration, or is first aware that the cancellation or expiration is threatened or otherwise may occur, whichever comes first.

§ B.2.1.9 Additional Insured Obligations. The Owner and its consultants and contractors shall be additional insureds on the Design-Builder's primary and excess insurance policies for Commercial General Liability, Automobile Liability and Pollution Liability. The additional insured coverage shall be primary and non-contributory to any of the Owner's insurance policies. The additional insured coverage shall apply to both ongoing operations and completed operations. The policy limits applicable to the additional insureds shall be the same amount applicable to the named insured or, if the policy provides otherwise, policy limits not less than the amounts required under this Agreement.

§ B.2.1.10 Certificates of Insurance. The Design-Builder shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article B.2: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon Owner's written request. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 of the Agreement and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section B.2.1. The certificates will show the Owner and its consultants and contractors as additional insureds on the Design-Builder's primary and excess insurance policies for Commercial General Liability, Automobile Liability, and Pollution

Liability. Information concerning reduction of coverage on account of revised limits, claims paid under the General Aggregate or both, shall be furnished by the Design-Builder with reasonable promptness.

§ B.2.2 Performance Bond and Payment Bond

The Design-Builder shall provide surety bonds as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum (\$0.00)

§ B.2.2.1 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Agreement, the Design-Builder shall promptly furnish a copy of the bonds or shall permit a copy to be made.

ARTICLE B.3 OWNER'S INSURANCE

§ B.3.1 Owner's Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ B.3.2 Property Insurance

§ B.3.2.1 Unless otherwise provided, at the time of execution of the Design-Build Amendment, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus the value of subsequent Modifications and cost of materials supplied or installed by others, comprising the total value for the entire Project at the site on a replacement cost basis without optional deductibles. If any construction that is part of the Work shall commence prior to execution of the Design-Build Amendment, the Owner shall, prior to commencement of construction, purchase and maintain property insurance as described above in an amount sufficient to cover the total value of the Work at the site on a replacement cost basis without optional deductibles. The insurance required under this section shall include interests of the Owner, Design-Builder, Architect, Consultants, Contractors, and Subcontractors in the Project. The property insurance shall be maintained, unless otherwise provided in the Design-Build Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of the insurance, until the Owner has issued a Certificate of Substantial Completion in accordance with Section 9.8 of the Agreement. Unless the parties agree otherwise, upon issuance of a Certificate of Substantial Completion, the Owner shall replace the insurance policy required under this Section B.3.2 with another property insurance policy written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 11.2.2 of the Agreement.

§ B.3.2.1.1 The insurance required under Section B.3.2.1 shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for the Design-Builder's services and expenses required as a result of such insured loss.

§ B.3.2.1.2 If the insurance required under Section B.3.2.1 requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ B.3.2.1.3 The insurance required under Section B.3.2.1 shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ B.3.2.1.4 Partial occupancy or use in accordance with Section 9.9 of the Agreement shall not commence until the insurance company or companies providing the insurance required under Section B.3.2.1 have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Design-Builder shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ B.3.2.2 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance, which shall specifically cover commissioning, testing, or breakdown of equipment required by the Work, if not

covered by the insurance required in Section B.3.2.1. This insurance shall include the interests of the Owner, Design-Builder, Architect, Consultants, Contractor and Subcontractors in the Work, and the Owner and Design-Builder shall be named insureds.

§ B.3.2.3 If the Owner does not intend to purchase the insurance required under Sections B.3.2.1 and B.3.2.2 with all of the coverages in the amounts described above, the Owner shall inform the Design-Builder in writing prior to any construction that is part of the Work. The Design-Builder may then obtain insurance that will protect the interests of the Owner, Design-Builder, Architect, Consultants, Contractors, and Subcontractors in the Work. The cost of the insurance shall be charged to the Owner by an appropriate Change Order. If the Owner does not provide written notice, and the Design-Builder is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, the Owner shall bear all reasonable costs and damages attributable thereto.

§ B.3.2.4 Loss of Use Insurance. At the Owner's option, the Owner may purchase and maintain insurance to insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Design-Builder for loss of use of the Owner's property, including consequential losses due to fire or other hazards covered under the property insurance required under this Exhibit B to the Agreement.

§ B.3.2.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section B.3.2.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ B.3.2.6 Before an exposure to loss may occur, the Owner shall file with the Design-Builder a copy of each policy that includes insurance coverages required by this Section B.3.2. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. The Owner shall provide written notification to the Design-Builder of the cancellation or expiration of any insurance required by this Article B.3. The Owner shall provide such written notice within five (5) business days of the date the Owner is first aware of the cancellation or expiration, or is first aware that the cancellation or expiration is threatened or otherwise may occur, whichever comes first.

§ B.3.2.7 Waivers of Subrogation. The Owner and Design-Builder waive all rights against (1) each other and any of their consultants, subconsultants, contractors and subcontractors, agents and employees, each of the other, and (2) any separate contractors described in Section 5.13 of the Agreement, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to Section B.3.2 or other property insurance applicable to the Work and completed construction, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Design-Builder, as appropriate, shall require of the separate contractors described in Section 5.13 of the Agreement, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of the other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ B.3.2.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section B.3.2.10. The Design-Builder shall pay the Architect, Consultants and Contractors their just shares of insurance proceeds received by the Design-Builder, and by appropriate agreements, written where legally required for validity, the Design-Builder shall require the Architect, Consultants and Contractors to make payments to their consultants and subcontractors in similar manner.

§ B.3.2.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with

the method of binding dispute resolution selected in the Agreement between the Owner and Design-Builder. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Design-Builder after notification of a Change in the Work in accordance with Article 6 of the Agreement.

§ B.3.2.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of a loss to the Owner's exercise of this power. If an objection is made, the dispute shall be resolved in the manner selected by the Owner and Design-Builder as the method of binding dispute resolution in the Agreement. If the Owner and Design-Builder have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

ARTICLE B.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

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Exhibit C

Sustainable Projects

for the following PROJECT:
(Name and location or address)

DEARNG – Bethany Beach Training Site
Transient Training Officer Barracks
Bethany Beach, Delaware
DEARNG No.: 2020-16

THE OWNER:
(Name, legal status and address)

« »« »
« »

THE DESIGN-BUILDER:
(Name, legal status and address)

« »« »
« »

THE AGREEMENT

This Sustainable Projects Exhibit is part of the accompanying agreement for the Project between the Owner and Design-Builder (hereinafter, the Agreement) dated the « » day of « » in the year « ».

(In words, indicate day, month and year.)

TABLE OF ARTICLES

- C.1 GENERAL PROVISIONS
- C.2 DESIGN-BUILDER
- C.3 OWNER
- C.4 CLAIMS AND DISPUTES
- C.5 MISCELLANEOUS PROVISIONS
- C.6 SPECIAL TERMS AND CONDITIONS

ARTICLE C.1 GENERAL PROVISIONS

§ C.1.1 This Exhibit, in conjunction with the Sustainability Plan and other Design-Build Documents, establishes requirements of the Owner, and the services to be provided by the Design-Builder, when the Project includes a Sustainable Objective. Except in the case of a conflict with the Owner's Criteria, where a provision in this Exhibit conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Exhibit will prevail.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

§ C.1.2 Definitions

§ C.1.2.1 Sustainable Objective. The Sustainable Objective is the Owner's goal of incorporating Sustainable Measures into the design, construction, maintenance and operations of the Project to achieve a Sustainability Certification or other benefit to the environment, to enhance the health and well-being of building occupants, or to improve energy efficiency. If not set forth in the Owner's Criteria, the Sustainable Objective will be identified in the Sustainability Plan.

§ C.1.2.2 Sustainable Measure. A Sustainable Measure is a specific design or construction element, or post occupancy use, operation, maintenance or monitoring requirement, that must be completed in order to achieve the Sustainable Objective. The Owner and Design-Builder shall each have responsibility for the Sustainable Measure(s) allocated to them in the Sustainability Plan.

§ C.1.2.3 Sustainability Plan. The Sustainability Plan is a Design-Build Document that identifies and describes: the Sustainable Objective; the targeted Sustainable Measures; implementation strategies selected to achieve the Sustainable Measures; the Owner's and Design-Builder's roles and responsibilities associated with achieving the Sustainable Measures; the specific details about design reviews; testing or metrics to verify achievement of each Sustainable Measure; and the Sustainability Documentation required for the Project.

§ C.1.2.4 Sustainability Certification. The Sustainability Certification is the initial third-party certification of sustainable design, construction, or environmental or energy performance, such as LEED®, Green Globes™, Energy Star or another rating or certification system, that may be designated as the Sustainable Objective or part of the Sustainable Objective for the Project. The term Sustainability Certification shall not apply to any recertification or certification occurring subsequent to the initial certification.

§ C.1.2.5 Sustainability Documentation. The Sustainability Documentation includes all documentation related to the Sustainable Objective, or to a specific Sustainable Measure, that the Owner or Design-Builder is required to prepare in accordance with the Design-Build Documents. Responsibility for preparation of specific portions of the Sustainability Documentation will be allocated among the Owner and Design-Builder in the Sustainability Plan and may include documentation required by the Certifying Authority.

§ C.1.2.6 Certifying Authority. The Certifying Authority is the entity that establishes criteria for achievement of a Sustainability Certification and is authorized to grant or deny a Sustainability Certification.

ARTICLE C.2 DESIGN-BUILDER

§ C.2.1 Scope of Design-Builder's Sustainability Services Prior to Execution of the Design-Build Amendment

§ C.2.1.1 The Design-Builder shall provide the Sustainability Services described in this Section C.2.1 in conjunction with the Work described in Article 4 of the Agreement.

§ C.2.1.2 Sustainability Certification Agreements. If the anticipated Sustainable Objective set forth in the Owner's Criteria includes a Sustainability Certification, the Design-Builder shall provide the Owner with copies of all agreements required by the Certifying Authority to register the Project and pursue the Sustainability Certification. The Owner and Design-Builder will review and confirm that the terms of those agreements are acceptable to the Owner before moving forward with the Sustainability Services under this Article C.2. The Owner agrees to execute all documents required by the Certifying Authority to be executed by the Owner; including any documentation required to establish the authority of the Design-Builder, the Architect, Contractor, or a Consultant, as an agent of the Owner for the limited purpose of pursuing the Sustainability Certification.

§ C.2.1.3 Preliminary Design

§ C.2.1.3.1 Sustainability Workshop. Prior to the conclusion of Preliminary Design, the Design-Builder, and as necessary the Design-Builder's Architect, Contractors, and Consultants, shall conduct a Sustainability Workshop with the Owner and, as requested by the Design-Builder, with the Owner's consultants, during which the participants will: review and discuss potential Sustainability Certifications; establish the Sustainable Objective; discuss potential Sustainable Measures to be targeted; examine strategies for implementation of the Sustainable Measures; and discuss the potential impact of the Sustainable Measures on the Project schedule and on the Owner's program and budget.

§ C.2.1.3.2 Sustainability Plan

§ C.2.1.3.2.1 Following the Sustainability Workshop, the Design-Builder shall prepare a Sustainability Plan based on the Sustainable Objective and targeted Sustainable Measures.

§ C.2.1.3.2.2 The Design-Builder shall submit the proposed Sustainability Plan to the Owner as part of the Design-Builder's submission of the Preliminary Design in accordance with Section 4.3.1 of the Agreement. The Sustainability Plan shall not change the Owner's Criteria unless the Owner and Design-Builder execute a Modification reflecting any such change.

§ C.2.1.4 Design-Builder's Proposal

§ C.2.1.4.1 As part of the Design-Builder's submission of the Design-Builder's Proposal, in accordance with Section 4.4.1 of the Agreement, the Design-Builder shall advise the Owner of any adjustments to the Sustainability Plan.

§ C.2.1.4.2 If the Owner and Design-Builder agree upon the Design-Builder's Proposal, including the Sustainability Plan, the Owner and Design-Builder shall include the Sustainability Plan in the Design-Build Amendment executed in accordance with Section 4.4.3 of the Agreement.

§ C.2.2 Work Following Execution of the Design-Build Amendment

§ C.2.2.1 The Design-Builder shall perform those Sustainable Measures identified as the responsibility of the Design-Builder in the approved Sustainability Plan and any approved changes to the Sustainability Plan.

§ C.2.2.2 Construction Documents. The Construction Documents prepared by the Design-Builder shall incorporate the Sustainable Measures identified in the Sustainability Plan, as appropriate.

§ C.2.2.3 As part of the Sustainable Measures, the Work may require the use of materials and equipment that have had limited testing or verification of performance. The Design-Builder may be unable to determine whether the materials or equipment will perform as represented by the manufacturer or supplier. The Design-Builder shall discuss with the Owner the proposed use of such materials or equipment, and potential effects on the Sustainable Objective that may occur if the materials or equipment fail to perform in accordance with the manufacturer's or supplier's representations. The Owner will render a written decision regarding the use of such materials or equipment in a timely manner. In the event the Owner elects to proceed with the use of such materials or equipment, the Design-Builder shall be permitted to rely on the manufacturer's or supplier's representations and shall not be responsible for any damages arising from failure of the material or equipment to perform in accordance with the manufacturer's or supplier's representations.

§ C.2.3 Construction Phase

§ C.2.3.1 The Design-Builder shall meet with the Owner to discuss alternatives in the event the Owner recognizes a condition that will affect achievement of a Sustainable Measure or achievement of the Sustainable Objective. If any condition is discovered by, or made known to, the Design-Builder that will adversely affect the Design-Builder's achievement of a Sustainable Measure for which the Design-Builder is responsible pursuant to the Sustainability Plan, the Design-Builder will promptly provide notice to the Owner and meet with the Owner to discuss alternatives to remedy the condition.

§ C.2.3.2 The Design-Builder shall be responsible for preparing and completing the Sustainability Documentation required by the Design-Build Documents, including any Sustainability Documentation required to be submitted after Substantial Completion.

§ C.2.4 Waste Management

The Design-Builder, in accordance with the Design-Build Documents, shall prepare and submit to the Owner a construction waste management and disposal plan setting forth the procedures and processes for salvaging, recycling or disposing of construction waste generated from the Project. The Design-Builder shall recycle, reuse, remove or dispose of materials as required by the Design-Build Documents.

§ C.2.5 Substantial Completion

Verification that the Project has achieved the Sustainable Objective, or the actual achievement of the Sustainable Objective, shall not be a condition precedent to issuance of a Certificate of Substantial Completion in accordance with Section 9.8.5 of the Agreement. Except for that portion of the Sustainability Documentation that by its nature must be

provided after Substantial Completion, the Design-Builder shall submit to the Owner the Sustainability Documentation required from the Design-Builder by the Design-Build Documents no later than the date of Substantial Completion.

§ C.2.6 Final Completion

§ C.2.6.1 Verification that the Project has achieved the Sustainable Objective, or the actual achievement of the Sustainable Objective, shall not be a condition precedent to issuance of the final Certificate for Payment in accordance with Section 9.10.1 of the Agreement.

§ C.2.6.2 In accordance with Section 9.10.2 of the Agreement, all Sustainability Documentation required from the Design-Builder by the Design-Build Documents shall be submitted to the Owner before final payment or any remaining retained percentage shall become due.

§ C.2.7 Project Registration and Submissions of Sustainability Documentation to the Certifying Authority

§ C.2.7.1 If the Sustainable Objective includes a Sustainability Certification, the Design-Builder shall perform the services set forth in this Section C.2.7.

§ C.2.7.2 The Design-Builder shall register the Project with the Certifying Authority. Registration fees, Review fees and any other fees charged by the Certifying Authority, and paid by the Design-Builder, shall be a reimbursable expense.

§ C.2.7.3 The Design-Builder shall collect, organize and manage the Sustainability Documentation; and submit the Sustainability Documentation to the Certifying Authority as required for the Sustainability Certification process.

§ C.2.7.4 Subject to Section C.3.4 and provided the Design-Builder receives timely notice from the Owner or Certifying Authority, the Design-Builder shall prepare and file necessary documentation with the Certifying Authority to appeal a ruling or other interpretation denying a requirement, prerequisite, credit or point necessary to achieve the Sustainability Certification.

§ C.2.7.5 The Design-Builder shall prepare and submit the application for certification of the Project to the Certifying Authority, including any required supporting documentation, in accordance with the Sustainability Plan.

§ C.2.7.6 The Design-Builder shall prepare responses to, and submit additional documentation required by, comments or questions received from the Certifying Authority.

§ C.2.7.7 Any certification, declaration or affirmation the Design-Builder makes to the Certifying Authority shall not constitute a warranty or guarantee to the Owner or the Owner's contractors or consultants.

§ C.2.8 Copyrights and Licenses

§ C.2.8.1 Solely for the purpose of obtaining or maintaining the Sustainability Certification, the Design-Builder grants to the Owner a nonexclusive license to submit the Design-Builder's Instruments of Service, directly or through third parties, to the Certifying Authority to comply with the requirements imposed by the Certifying Authority and further grants the Owner a nonexclusive license to allow the Certifying Authority to publish the Instruments of Service in accordance with the policies and agreements required by the Certifying Authority. The licenses granted in this Section C.2.8 are valid only if the Owner substantially performs its obligations under the Agreement, including prompt payment of all sums when due.

§ C.2.8.2 The Design-Builder and the Owner warrant that in transmitting Instruments of Service, or any other information, the transmitting party is the copyright owner of such information or has permission from the copyright owner to transmit such information for its use on the Project and to allow the Certifying Authority to publish the Instruments of Service, or any other information, in accordance with the policies and agreements required by the Certifying Authority.

§ C.2.8.3 Submission or distribution of Instruments of Service to meet requirements of a Certifying Authority, in connection with the Project, is not to be construed as publication in derogation of the reserved rights of the Design-Builder or those of the Architect, Consultants and Contractors.

ARTICLE C.3 OWNER

§ C.3.1 The Owner shall perform those Sustainable Measures identified as the responsibility of the Owner in the Sustainability Plan, or as otherwise required by the Design-Build Documents. The Owner shall require that each of its separate contractors and consultants performs the separate contractor's or consultant's services in accordance with the Sustainability Plan.

§ C.3.2 The Owner shall provide to the Design-Builder information requested by the Design-Builder that is reasonably relevant and necessary for achievement of the Sustainable Objective.

§ C.3.3 Unless the Design-Build Documents provide otherwise, the Owner shall provide the services of a commissioning agent who shall be responsible for commissioning of the Project.

§ C.3.4 The Owner shall be responsible for preparing, filing, and prosecuting appeals to the Certifying Authority, or taking any other actions determined by the Owner to be necessary or desirable, arising from the revocation or reduction of an awarded Sustainability Certification.

§ C.3.5 The Owner shall comply with the requirements of the Certifying Authority as they relate to the ownership, operation and maintenance of the Project both during construction and after completion of the Project.

ARTICLE C.4 CLAIMS AND DISPUTES

Waiver of Consequential Damages Relating to the Sustainable Objective. The Owner and Design-Builder waive claims against each other for consequential damages resulting from the failure of the Project to achieve the Sustainable Objective or one or more of the Sustainable Measures, including unachieved energy savings, unintended operational expenses, lost financial or tax incentives, or unachieved gains in worker productivity.

ARTICLE C.5 MISCELLANEOUS PROVISIONS

The Owner and Design-Builder acknowledge that achieving the Sustainable Objective is dependent on many factors beyond their control, such as the Owner's use and operation of the Project or the work or services provided by the Owner's separate contractors or consultants; or interpretation of credit requirements by a Certifying Authority. Accordingly, the Design-Builder does not warrant or guarantee that the Project will achieve the Sustainable Objective.

ARTICLE C.6 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Sustainable Projects Exhibit, if any, are as follows:

« »

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STATE OF DELAWARE
DELAWARE ARMY NATIONAL GUARD

PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal (“**Principal**”), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety (“**Surety**”), are held and firmly bound unto the Delaware Army National Guard (“**Owner**”), in the amount of _____ (\$_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole, firmly by these presents.

Sealed with our seals and dated this _____ day of _____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as DEARNG Contract No. _____ dated the _____ day of _____, 20__ (the “Contract”), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse **Owner** sufficient funds to pay the costs of completing the Contract that **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, hereby stipulates and agrees, if requested to do so by **Owner**, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause **Principal** fails or neglects to so fully perform and complete such work.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other

transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

Name:

By: _____ (SEAL)
Name:
Title:

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

Name:

By: _____ (SEAL)
Name:
Title:

(Corporate Seal)

STATE OF DELAWARE
DELAWARE ARMY NATIONAL GUARD

PAYMENT BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal (“**Principal**”), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety (“**Surety**”), are held and firmly bound unto the **Delaware Army National Guard** (“**Owner**”), in the amount of _____ (\$_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this _____ day of _____, 20__.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as DEARNG Contract No.: 2020-16 dated the _____ day of _____, 20__ (the “**Contract**”), which **Contract** is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the **Contract**, all and every sums of money due him, her, them or any of them, for all such materials, labor and service for which **Principal** is liable, shall make good and reimburse **Owner** sufficient funds to pay such costs in the completion of the **Contract** as **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the **Contract** and for as long as provided by the **Contract**; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the **Contract** or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the **Contract** shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

Name:

(Corporate Seal)

By: _____(SEAL)
Name:
Title:

SURETY

Name: _____

Witness or Attest: Address: _____

Name:

(Corporate Seal)

By: _____(SEAL)
Name:
Title:

SECTION 00 72 13

**GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
A201 - 2017**

The General Conditions of this Contract are as stated in the American Institute of Architects Document AIA A201 (2017 Edition) entitled General Conditions of the Contract for Construction as revised by the Supplementary General Conditions and is part of this project manual as if herein written in full.

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AIA[®] Document A201[™] – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

TABLE OF ARTICLES

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- 13 MISCELLANEOUS PROVISIONS
- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503[™], Guide for Supplementary Conditions.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

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G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

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§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

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delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely

upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

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§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

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- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

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promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during

that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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SUPPLEMENTARY GENERAL CONDITIONS A201-2017

The following supplements modify the “General Conditions of the Contract for Construction,” AIA Document A201-2017. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

TABLE OF ARTICLES

1. GENERAL PROVISIONS
2. OWNER
3. CONTRACTOR
4. ADMINISTRATION OF THE CONTRACT
5. SUBCONTRACTORS
6. CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7. CHANGES IN THE WORK
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9. PAYMENTS AND COMPLETION
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13. MISCELLANEOUS PROVISIONS
14. TERMINATION OR SUSPENSION OF THE CONTRACT
15. CLAIMS AND DISPUTES

ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Strike the last sentence of Section 1.1.1 in its entirety and replace with the following:

“The Contract Documents also include Advertisement for Bid, Instructions to Bidder, sample forms, the Bid Form, the Contractor’s completed Bid and the Award Letter.”

Add the following Section:

“1.1.1.1 In the event of conflict or discrepancies among the Contract Documents, the Documents prepared by the State of Delaware, Division of Facilities Management shall take precedence over all other documents.”

1.1.8 INITIAL DECISION MAKER

Strike the last sentence of Section 1.1.8 in its entirety and add the following to the end of the remaining sentence:

“ and certify termination of the Agreement under Section 14.2.2.”

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1.1 Insert “if possible” at the end of the second sentence.

Add the following Sections:

“1.2.4 In the case of an inconsistency between the Drawings and the Specifications, or within either document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect’s interpretation.”

“1.2.5 The word “PROVIDE” as used in the Contract Documents shall mean “FURNISH AND INSTALL” and shall include, without limitation, all labor, materials, equipment, transportation, services and other items required to complete the Work.”

“1.2.6 The word “PRODUCT” as used in the Contract Documents means all materials, systems and equipment.”

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

Strike Section 1.5.1 in its entirety and replace with the following:

“All pre-design studies, drawings, specifications and other documents, including those in electronic form, prepared by the Architect under this Agreement are, and shall remain,

the property of the Owner whether the Project for which they are made is executed or not. Such documents may be used by the Owner to construct one or more like Projects without the approval of, or additional compensation to, the Architect. The Contractor, Subcontractors, Sub-subcontractors, and Material or Equipment Suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or Material and Equipment Supplier on other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and Architect's consultants.

The Architect shall not be liable for injury or damage resulting from the re-use of drawings and specifications if the Architect is not involved in the re-use Project. Prior to re-use of construction documents for a Project in which the Architect is not also involved, the Owner will remove from such documents all identification of the original Architect, including name, address and professional seal or stamp.”

Strike Section 1.5.2 in its entirety.

1.7 DIGITAL DATA USE AND TRANSMISSION

Strike Section 1.7 in its entirety and replace with the following:

“The parties shall agree upon protocols governing transmission and use of Instruments of Service or any other information or documentation in digital form.”

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Strike Section 1.8 in its entirety.

ARTICLE 2: OWNER

2.2 EVIDENCE OF THE OWNERS FINANCIAL ARRANGEMENTS

Strike Section 2.2 in its entirety.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.3 Strike 2.3.3 in its entirety.

2.3.4 Add the following sentence at the end of the paragraph:

“The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all cost for any repairs required, out of failure to accurately identify said utilities.”

Strike Section 2.3.6 in its entirety and replace with the following:

“2.3.6The Contractor shall be furnished free of charge (1) electronic set of the Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage and handling.”

2.5 OWNER’S RIGHT TO CARRY OUT THE WORK

Add “, except as outlined in Section 3.15” after the reference to “Article 15” at the end of the last sentence of the Section.

ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.2 Add “and Owner” after “report to the Architect” in the second sentence.

3.2.4 Strike “subject to Section 15.1.7” in the second sentence.

3.2.4 Strike the third sentence.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Sections:

“3.3.2.1 The Contractor shall immediately remove from the Work, whenever requested to do so by the Owner, any person who is considered by the Owner or Architect to be incompetent or disposed to be so disorderly, or who for any reason is not satisfactory to the Owner, and that person shall not again be employed on the Work without the consent of the Owner or the Architect.”

“3.3.4The Contractor must provide suitable storage facilities at the Site for the proper protection and safe storage of their materials, or as otherwise identified by the specifications. Consult the Owner and the Architect before storing any materials.”

“3.3.5When any room is used as a shop, storeroom, office, etc., by the Contractor or Subcontractor(s) during the construction of the Work, the Contractor making use of these areas will be held responsible for any repairs, patching or cleaning arising from such use.”

3.4 LABOR AND MATERIALS

Add the Following Sections:

“3.4.4Before starting the Work, each Contractor shall carefully examine all preparatory Work that has been executed to receive their Work. Check carefully, by whatever means are required, to insure that its Work and adjacent, related Work, will finish to proper contours, planes and levels. Promptly notify the Architect & Owner of any defects or imperfections in preparatory Work which will in any way affect satisfactory completion of its Work. Absence of such notification will be construed as an acceptance of preparatory Work and later claims of defects will not be recognized.”

“3.4.5 Under no circumstances shall the Contractor’s Work proceed prior to preparatory Work having been completely cured, dried and/or otherwise made satisfactory to receive this Work. Responsibility for timely installation of all materials rests solely with the Contractor responsible for that Work, who shall maintain coordination at all times.”

3.5 WARRANTY

Add the following Sections:

“3.5.3 The Contractor will guarantee all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two years after Acceptance by the Owner, and will maintain all items in perfect condition during the period of warranty.”

“3.5.4 Defects appearing during the period of warranty will be made good by the Contractor at his expense upon demand of the Owner, it being required that all work will be in perfect condition when the period of warranty will have elapsed.”

“3.5.5 Upon notification by the Owner of a defect covered by the Contractor’s warranty, the Contractor shall respond within 4 hours of the notification.”

“3.5.6 In addition to the General Warranty there are other warranties required for certain items for different periods of time than the two years as above, and are particularly so stated in that part of the specifications referring to same. The said warranties will commence at the same time as the General Warranty.”

“3.5.7 If the Contractor fails to remedy any failure, defect or damage within a reasonable time after receipt of notice, the Owner will have the right to replace, repair, or otherwise remedy the failure, defect or damage at the Contractor’s expense.”

3.8 ALLOWANCES

Add the following Section:

“3.8.1.1 For costs to be covered under a project allowance, (included in the schedule of values) the Contractor shall submit a summary of those costs anticipated and an Allowance Access Authorization Form to the Architect and Owner, reflecting the projected costs. The Allowance Access Authorization Form must be signed by the Owner prior to initiating any work associated with the allowance.”

3.10 CONTRACTOR’S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add “estimated” after “and the” and before “date of” in the second sentence.

3.10.2 Strike “and thereafter as necessary to maintain a current submittal schedule” in the first sentence.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following Sections:

“3.11.1 During the course of the Work, the Contractor shall maintain a record set of drawings on which the Contractor shall mark the actual physical location of all piping, valves, equipment, conduit, outlets, access panels, controls, actuators, including all appurtenances that will be concealed once construction is complete, etc., including all invert elevations.”

“3.11.2 At the completion of the project, the Contractor shall obtain a set of the conformed contract drawings from the Architect, and neatly transfer all information outlined in 3.11.1 to provide a complete record of the as-built conditions.”

“3.11.3 Upon completion of the work noted in 3.11.2 the contractor shall schedule a meeting with the Architect/Engineer and Owner to review the final record drawings and closeout documents prior to submission. After this meeting the Contractor shall make adjustments per the review, and submit one (1) original markup and (2) copies of the red line drawings (as-built conditions, to the Owner and one (1) print to the Architect. In addition, attach one complete set of the as-built documents to each of the Operating and Maintenance Instructions/Manuals. The Contractor will include (2) USB drives, each containing all “red line drawings (as-built) and Closeout Documents properly tabbed in accordance with closeout requirements as defined elsewhere in the contract documents.”

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.10.2 Strike “If the Contract Documents require” from the beginning of the sentence.

3.12.10.2 Strike “to” between “professional” and certify” and replace with “shall”.

3.17 Insert “indemnify and” between “shall” and “hold” in the second sentence.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.7 Strike the first sentence and replace with the following:

“The Architect will review and approve or take other appropriate action upon the Contractor’s submittals such as Shop Drawings, Product Data and Samples for the purpose of checking for conformance with the Contract Documents.”

4.2.7 Strike the second sentence and replace with the following:

“The Architect’s action will be taken with such reasonable promptness as to cause no delay in the Work in the activities of the Owner, Contractor or separate Contractors, while allowing sufficient time in the Owner’s professional judgment to permit adequate review.”

Add the following Section:

“4.2.10.1 There will be no full-time Project Representative provided by the Owner or Architect on this project.”

“4.2.13 Add “and in compliance with all local requirements.” to the end of the sentence.”

ARTICLE 5: SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.3 Strike Section 5.2.3 in its entirety and replace with the following:

“If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.”

5.2.4 Strike Section 5.2.4 in its entirety and replace with the following:

”The Contractor may not substitute any Subcontractor listed in its Bid unless the Contractor complies with the requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4. Failure to comply with this requirement shall subject the Contractor to a penalty as outlined in Section 5.2 of the Owner’s General Requirements.”

Add the following Section:

“5.2.5 The Contractor shall comply and shall ensure all Subcontractors comply with all requirements for drug testing as set forth in TITLE 19 LABOR DELAWARE ADMINISTRATIVE CODE 4000 Office of Management and Budget 4100 Division of Facilities Management **4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects.**”

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 Strike “and waiver of subrogation” from the end of the second sentence.

6.1.4 Strike Section 6.1.4 in its entirety.

6.2 MUTUAL RESPONSIBILITY

6.2.3 Strike “shall” and replace with “may” in the second sentence.

ARTICLE 7: CHANGES IN THE WORK

(SEE ARTICLE 7: CHANGES IN WORK IN THE STATE OF DELAWARE DIVISION OF FACILITIES MANAGEMENT GENERAL REQUIREMENTS)

- 7.3.4.1 Strike “and other employee costs approved by the Architect” after “worker’s compensation insurance,”
- 7.3.4.4 Add “work attributable to the” before “change” at the end of the sentence.
- 7.4 MINOR CHANGES IN WORK
Add “unless such changes are approved” at the end of the third sentence.

ARTICLE 8: TIME

8.2 PROGRESS AND COMPLETION

8.2.1 Add the following Section:

“8.2.1.1 Refer to Project Specifications Section SUMMARY OF WORK for Contract time requirements.”

8.2.2 After “by the Contractor” strike “and” and insert “to”.

8.2.4 Add the following Section:

“8.2.4If the Work falls behind the Progress Schedule as submitted by the Contractor, the Contractor shall employ additional labor and/or equipment necessary to bring the Work into compliance with the Progress Schedule at no additional cost to the Owner.”

8.3 DELAYS AND EXTENSION OF TIME

8.3.1 Strike “binding dispute resolution” and insert “any and all remedies at law or in equity”.

Add the following Section:

“8.3.2.1 The Contractor shall update the status of the suspension, delay, or interruption of the Work with each Application for Payment. (The Contractor shall report the termination of such cause immediately upon the termination thereof.) Failure to comply with this procedure shall constitute a waiver for any claim for adjustment of time or price based upon said cause.”

Strike Section 8.3.3 in its entirety and replace with the following:

8.3.3 “Except in the case of a suspension of the Work directed by the Owner, an extension of time under the provisions of Section 8.3.1 shall be the Contractor’s sole remedy in the progress of the Work and there shall be no payment or compensation to the Contractor for any expense or damage resulting from the delay.”

Add the following Section:

“8.3.4By permitting the Contractor to work after the expired time for completion of the project, the Owner does not waive their rights under the Contract.”

ARTICLE 9: PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Add the following Sections:

“9.2.1 The Schedule of Values shall be submitted using AIA Document G703, Continuation Sheet to G702.”

“9.2.2 The Schedule of Values is to include a line item for Project Closeout Document Submittal. The value of this item is to be no less than 1.5% of the initial contract amount.”

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Strike Section 9.3.1 in its entirety and replace with the following:

“At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values for completed portions of the Work. The application shall be notarized, and supported by all data substantiating the Contractor’s right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage.”

Add the following Sections:

“9.3.1.3 Application for Payment shall be submitted on AIA Document G702 “Application and Certificate for Payment”, supported by AIA Document G703 “Continuation Sheet”. Said Applications shall be fully executed and notarized.”

“9.3.4 Until Closeout Documents have been received and outstanding items completed the Owner will pay 95% (ninety-five percent) of the amount due the Contractor on account of progress payments.”

“9.3.5 The Contractor shall provide a current and updated Progress Schedule to the Architect with each Application for Payment. Failure to provide Schedule will be just cause for rejection of Application for Payment.”

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following Subsections to 9.5.1:

- .8 failure to provide a current Progress Schedule;
- .9 a lien or attachment is filed;
- .10 failure to comply with mandatory requirements for maintaining Record Documents.

9.6 PROGRESS PAYMENTS

9.6.1 Strike Section 9.6.1 in its entirety and replace with the following:

“9.6.1 After the Architect has approved and issued a Certificate for Payment, payment shall be made by the Owner within 30 days after Owner’s receipt of the Certificate for Payment.”

9.6.8 Strike “Provided the Owner has fulfilled its payment obligations under the Contract Documents,” in the first sentence.

9.7 FAILURE OF PAYMENT

Strike Section 9.7 in its entirety and replace with the following:

“If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within fourteen days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within thirty days after the date established in the Contract Documents, the amount certified by the Architect, then the Contractor may, upon thirty additional days’ notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.”

9.8 SUBSTANTIAL COMPLETION

9.8.3 At the end of Section 9.8.3, add the following sentence:

“If the Architect is required to make more than 2 inspections of the same portion of work, the Contractor shall be responsible for all costs associated with subsequent inspections including but not limited to any Architect’s fees.”

9.8.5 Strike “shall” and insert “may” in the second sentence.

9.8.5 Insert “1/2 of the” after “make payment of” in the second sentence.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 Strike the the first sentence and replace with the following (the remainder of the Section remains as written):

“The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use authorized by public authorities having jurisdiction over the Project.”

9.10.2 Strike “to remain in force after final payment is currently in effect” after “required by the Contract Documents” and replace with “shall remain in force until final payment is completed” in the first sentence.

9.10.4.4 Strike “if permitted by the Contract Documents,”

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Sections:

10.1.1 Each Contractor shall develop a safety program in accordance with the Occupational Safety and Health Act of 1970. A copy of said plan shall be furnished to the Owner and Architect prior to the commencement of that Contractor's Work.

10.1.2 Each Contractor shall appoint a Safety Representative. Safety Representatives shall be someone who is on site on a full time basis. If deemed necessary by the Owner or Architect, Contractor Safety meetings will be scheduled. The attendance of all Safety Representatives will be required. Minutes will be recorded of said meetings by the Contractor and will be distributed to all parties as well as posted in all job offices/trailers etc.

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following Section:

10.2.4.1 As required in the Hazardous Chemical Act of June 1984, all vendors supplying any material that may be defined as hazardous must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a caution warning on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in foreseeable emergency situations. Material Safety Data Sheets shall be provided directly to the Owner, along with the shipping slips that include those products.

10.2.5 Strike the second sentence in its entirety.

10.3 HAZARDOUS MATERIALS AND SUBSTANCES

10.3.3 Strike Section 10.3.3 in its entirety.

10.3.4 Insert "hazardous" in the last sentence after "handling of such" .

10.3.6 Strike Section 10.3.6 in its entirety.

ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE AND BONDS

11.1.1 Strike "Owner" from the third sentence.

11.2 OWNER'S LIABILITY INSURANCE

Strike 11.2 in its entirety, except that in the case of school projects in which case Section 11.2 shall remain.

11.3 WAIVERS OF SUBROGATION

Delete Section 11.3 in its entirety

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION
INSURANCE

Delete Section 11.4 in its entirety

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

Add the following Section:

“12.2.2.1.1 At any time during the progress of the Work, or in any case where the nature of the defects will be such that it is not expedient to have corrected, the Owner, at its option, will have the right to deduct such sum, or sums, of money from the amount of the Contract as it considers justified to adjust the difference in value between the non-conforming work and that required under contract including any damage to the structure.”

12.2.2.1 Strike all references to “one year” or “one-year” and replace with “two years”.

12.2.2.2 Strike “one-year” and replace with “two years”.

12.2.2.3 Strike “one-year” and replace with “two years”.

12.2.5 Strike “one-year” and replaced with “two years”.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Strike the last sentence.

13.4 TESTS AND INSPECTIONS

13.4.1 Strike the last sentence and replace with the following:

“The Owner shall pay for tests, inspections, or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.”

13.5 INTEREST

Strike “the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the

Project is located” and replace with “30 days of presentment of the authorized Certificate of Payment at the annual rate of 12% or 1% per month.”

Insert the following Section:

“13.6 CONFLICTS WITH FEDERAL STATUTES OR REGULATIONS

13.6.1 If any provision, specifications or requirement of the Contract Documents conflict or is inconsistent with any statute, law or regulation of the government of the United State of America, the Contractor shall notify the Architect and Owner immediately upon discovery.”

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1.4 Insert “, upon the Contractors’ request,” after “furnish to the Contractor”.

14.1.3 Strike “and profit on Work not executed, and” after “as well as reasonable overhead” and replace with “, profit, and reasonable”

14.3 SUSPENSION BY OWNER FOR CONVENIENCE

14.3.2 Strike “Adjustment of the Contract Sum shall include profit”.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.3 Strike Section 14.4.3 in its entirety and replace with the following:

“In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and reasonable costs incurred by reason of such termination along with reasonable overhead.”

ARTICLE 15: CLAIMS AND DISPUTES

15.1 CLAIMS

15.1.2 TIME LIMITS ON CLAIMS

Strike the last sentence.

15.1.3 NOTICE OF CLAIM

Strike all references to “21” and replace with “45”.

15.1.5 CLAIMS FOR ADDITIONAL COSTS

Strike the first sentence and replace with the following:

“Contractor shall not proceed to execute any portion of the Work that is subject to the Claim without prior approval of the costs or method of payment for the costs associated with the Claim as determined by the Architect and approved by the Owner.”

15.1.7 WAIVER OF CLAIMS FOR CONSEQUENTIAL DAMAGES

Strike Section 15.1.7 in its entirety.

15.2 INITIAL DECISION

15.2.1 Strike “and binding dispute resolution” in the fourth sentence and replace with “or any and all remedies at law or in equity”.

15.2.5 Strike Section 15.2.5 in its entirety and replace with the following:

“The Architect will approve or reject Claims by written decision, which shall state the reasons therefore and shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be subject to mediation and any or all remedies at law or in equity.”

15.2.6 Strike Section 15.2.6 and its sub-Sections in their entirety.

15.3 MEDIATION

15.3.1 Strike “binding dispute resolution” and replace with “any or all remedies at law or in equity”.

15.3.2 Strike “, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,” in the first sentence.

15.3.2 Strike all references to “binding dispute resolution” and replace with “any or all remedies at law and in equity”.

15.3.3 Strike Section 15.3.3 in its entirety.

15.4 ARBITRATION

Strike Section 15.4 and its Subsections in their entirety.

END OF SECTION

SECTION 00 73 46

WAGE RATES DETERMINATION SCHEDULE

State of Delaware, Department of Labor Division of Industrial Affairs has established the category and associated prevailing wage rates for this project. The project approved prevailing wage rate determination schedule follows.

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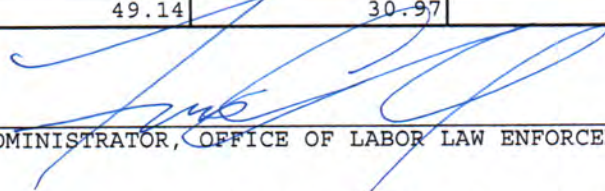
STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 761-8327

Mailing Address:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

Located at:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

PREVAILING WAGES FOR BUILDING CONSTRUCTION EFFECTIVE MARCH 15, 2022

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	25.81	31.79	46.27
BOILERMAKERS	77.28	39.21	57.64
BRICKLAYERS	61.64	61.64	61.64
CARPENTERS	58.31	58.31	46.55
CEMENT FINISHERS	81.52	57.97	25.02
ELECTRICAL LINE WORKERS	51.33	44.02	33.56
ELECTRICIANS	76.72	76.72	76.72
ELEVATOR CONSTRUCTORS	106.08	72.81	92.00
GLAZIERS	80.05	80.05	63.96
INSULATORS	63.53	63.53	63.53
IRON WORKERS	72.06	72.06	72.06
LABORERS	51.90	51.90	51.90
MILLWRIGHTS	80.13	80.13	64.33
PAINTERS	56.20	56.20	56.20
PILEDRIVERS	81.87	44.43	35.93
PLASTERERS	33.69	33.69	24.97
PLUMBERS/PIPEFITTERS/STEAMFITTERS	74.05	71.65	65.81
POWER EQUIPMENT OPERATORS	77.29	77.29	77.29
ROOFERS-COMPOSITION	27.98	28.10	27.25
ROOFERS-SHINGLE/SLATE/TILE	20.76	24.69	19.42
SHEET METAL WORKERS	80.03	80.03	80.03
SOFT FLOOR LAYERS	56.81	56.81	56.81
SPRINKLER FITTERS	65.57	65.57	65.57
TERRAZZO/MARBLE/TILE FNRS	69.16	69.16	70.74
TERRAZZO/MARBLE/TILE STRS	76.82	76.82	78.45
TRUCK DRIVERS	49.14	30.97	24.11

CERTIFIED: 03/15/2022 BY: 
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 761-8327.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

THESE RATES ARE BEING PROVIDED IN ACCORDANCE WITH DELAWARE'S FREEDOM OF INFORMATION ACT.
THEY ARE NOT INTENDED TO APPLY TO ANY SPECIFIC PROJECT.

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SECTION 00 74 00

DEARNG REQUIREMENTS & PROCEDURES

The DEARNG Requirements are to be used for this Contract are listed below. Draft samples of the applicable forms have been included for use.

- 00 74 73.13 DEARNG Statutory Requirements
- 00 74 73.14 DEARNG Security Requirements & Procedures – Antiterrorism Plan FY22
- 00 74 73.15 GCAPL 22-06 Buy America Preference in Federal Financial Assistance Program for Infrastructure
- 00 74 73.16 GCAPL 23-02 Build America Buy America Waiver Process

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DEARNG STATUTORY REQUIREMENTS

The Delaware Army National Guard (DEARNG) has mandated adherence to all sections identified and defined in ARTICLE VIIi – APPLICABLE LAWS AND REGULATIONS as part of the contractual conditions for this project. A copy of this document is included within.

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ARTICLE VIII – APPLICABLE LAWS AND REGULATIONS**Section 801. Applicable Law.**

This MCCA is incidental to implementation of a federal program. Accordingly, this MCCA shall be governed by and construed according to federal law as it may affect rights, remedies, and obligations of the United States.

Section 802. Governing Regulations.

To the extent not inconsistent with express terms of this MCCA, provisions of 32 CFR Part 33, Uniform Administrative Requirements for Grants and Cooperative Agreements, the DoD 3210.6R, DoD Grant and Agreement Regulations (4/13/98), OMB Circular A-87, and NGR 5-1/ANGI 63-101, which circular and regulations are hereby incorporated into this MCCA by reference as if fully set forth herein, shall govern this MCCA.

Section 803. Officials Not to Benefit

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit arising from it, in accordance with 41 U.S.C. 22.

Section 804. Nondiscrimination.

The State covenants and agrees that by signing this agreement or accepting funds under this agreement, the recipient assures that it will comply with applicable provision of the following, national policies prohibiting discrimination:

- a. On the basis of race, color, or national origin, in Title VII of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq.), as implemented by DOD regulations 32 CFR Part 195.
- b. On the basis of race, color, religion, sex, or national origin, in Executive Order 11246 [3 CFR, 1964-1965 Comp. p. 339], as implemented by Department of Labor regulations issued thereunder (41 CFR Part 60);
- c. On the basis of handicap, in Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794) as implemented by Department of Justice regulations at 28 CFR part 41 and DoD Regulations at 32 CFR Part 56; and,
- d. On the basis of Age, in the Age Discrimination Act of 1975 (42 U.S.C. § 6101 et seq.) as implemented by Department of Health and Human Services regulations at 45 CFR Part 90.

Section 805. Lobbying.

a. The State covenants and agrees that it will not expend any funds appropriated by Congress to pay any person for influencing or attempting to influence an officer or employee of any agency or a member of Congress in connection with any of the following covered federal actions: The awarding of any federal contract; the making of any federal grant; the making of any federal loan; the entering into of any cooperative agreement; and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

b. New Restrictions on Lobbying, issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 28) to implement provisions of Section 319 of Public Law 102-121 (31 U.S.C. § 1352) is incorporated by reference and the State agrees to comply with provisions thereof, including amendments to the that may hereafter be issued.

Section 806. Drug-Free Work Place.

a. The State covenants and agrees that it will comply with provisions of the Drug-Free Work Place Act of 1988 (Public Law 100-690, Title V, Subtitle D; 41 U.S.C. § 701 et seq.) and will maintain a drug-free workplace.

b. Government-Wide Requirements for Drug-Free Workplace (Grants), issued by the Office of Management and Budget and the Department of Defense (41 USC 702) to implement provisions of the Drug-Free Work Place Act of 1988, is incorporated by reference and the State covenants and agrees to comply with provisions thereof, including amendments that may hereafter be issued.

Section 807. Environmental Standards. (By signing this agreement or accepting funds under this agreement, the recipient assure that it will):

- a. Comply with applicable provision of the Clean Air Act (42 U.S.C. § 7401, et seq) and Clean Water Act (33 USC 1251, et.seq.), as implemented by Executive Order 11738 [3 CFR, 1971-1975 comp., p.799] and Environmental Protection Agency (EPA) rules at 40 CFR Part 15. In accordance with the EPA rules, the recipient further agrees that it will:
- Not use any facility on the EPA's List of Violating Facilities in performing any award that is nonexempt under 40 CFR 15.5 (awards of less than \$100,000, and certain other awards, exempt from the EPA regulations), as long as the facility remains on the list.
 - Notify the awarding agency if it intends to use a facility in performing this award that is on the List of Violating Facilities or that the recipient knows has been recommended to be placed on the List of Violating Facilities.

b. Identify to the awarding agency any impact this award may have on:

- (1) The quality of the human environment, and provide help the agency may need to comply with the National Environmental Policy Act (NEPA, at 42 U.S.C 4321, et.seq.) and to prepare Environment Impact Statements or other required environmental documentation. In such cases, the recipient agrees to take no action that will have an adverse environmental impact (e.g., physical disturbance of a site such as breaking of ground) until the agency provides written notification of compliance with the environmental impact analysis process.
- (2) Flood-prone areas, and provide help the agency may need to comply with the National Flood Insurance Act of 1968 and Flood Disaster Protection Act of 1973 (42 U.S.C. 4001, et. Seq.), which require flood insurance, when available, for Federally assisted construction or acquisition in flood-prone areas.
- (3) Coastal zones, and provide help the agency may need to comply with the Coastal Zone Management Act of 1972 (16 U.S.C. 1451, et seq.), concerning protection of U.S. coastal resources.
- (4) Coastal barriers, and provide help the agency may need to comply with the Coastal Barriers Resource Act (16 U.S.C. 3501 et.seq.), concerning preservation of barrier resources.
- (5) Any existing or proposed component of the National Wild and Scenic Rivers system, and provide help the agency may need to comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.).
- (6) Underground sources of drinking water in areas that have an aquifer that is the sole or principal drinking water source, and provide help the agency may need to comply with the Safe Drinking Water Act (42 U.S.C 300h-3).

Section 808. Preference for U.S. Flag Air Carriers.

(Any agreement under which international air travel may be supported by U.S. Government funds)

Travel supported by U.S. Government funds under this agreement shall use U.S flag air carriers (air carriers holding certificates under 49U.S.C. 41102) for international air transportation of people and property to the extent that such service is available, in accordance with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) and the interpretative guidelines issued by the Comptroller General of the United States in the March 31, 1981, amendment to Comptroller General Decision B138942.

Section 809. Debarment and Suspension.

a. The State shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in federal assistance programs under Executive Order 12549 "Debarment and Suspension".

b. Government-Wide Debarment and Suspension (Nonprocurement), issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 25) to implement provisions of Executive Order 12549 "Debarment and Suspension," is incorporated by reference and the State covenants and agrees to comply with provisions thereof, including amendments that may hereafter be issued.

Section 810. Buy American Act.

The State covenants and agrees that it will not expend any funds appropriated by Congress without complying with The Buy American Act (41 U.S.C. 10). The Buy American Act gives preference to domestic end products and domestic construction material. In addition, the Memorandum of Understanding between the United States of America and the European Economic Community (EEC) on Government Procurement, and the North American Free Trade Agreement (NAFTA), provide that EEC and NAFTA end products and construction materials are exempted from application of the Buy American Act.

Section 811. Relocation Assistance and Real Property Acquisition Policies.

The State covenants and assures that it will comply with 49 CFR part 24, which implements the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601 *et seq.*) and provides for fair and equitable treatment of persons displaced by Federally assisted programs or persons whose property is acquired as a result of such programs.

Section 812. Copeland "Anti-Kickback" Act. (*All contracts and subgrants for construction or repair*)

The State covenants and agrees that it will comply with the Copeland "Anti-Kickback" Act (18 U.S.C. 874), as supplemented in Department of Labor regulations (29 CFR Part 3). As applied to this MCCA, the Copeland "Anti-Kickback" Act makes it unlawful to induce, by force, intimidation, threat of procuring dismissal from employment, or otherwise, any person employed in the construction or repair of public buildings or public works, financed in whole or in part by the United States, to give up any part of the compensation to which that person is entitled under a contract of employment.

Section 813. Contract Work Hours and Safety Standards Act. (*Construction contracts awarded by grantees and subgrantees in excess of \$2,000, and in excess of \$2,500 for other contracts which involve the employment of mechanics and laborers*)

The State covenants and agrees that it will comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330), as supplemented by Department of Labor regulations (29 CFR Part 5). As applied to this MCCA, the Contract Work Hours and Safety Standards Act specifies that no laborer or mechanic doing any part of the work contemplated by this MCCA shall be required or permitted to work more than 40 hours in any work week unless paid for all additional hours at not less than 1 1/2 times the basic rate of pay.

**Section 814. Davis-Bacon Act. Contractor to comply with State of Delaware prevailing wage requirements, pursuant to Delaware Code, Title 29, Section 6960
~~DO NOT USE THIS CLAUSE UNLESS AUTHORIZED BY NCB ARI.~~**

~~The State covenants and agrees that it will comply with the Davis-Bacon (40 U.S.C. 276 a to a-7) as supplemented by U.S. Department of Labor regulations (29 CFR Part 5). (Construction contracts in excess of \$2,000 awarded by grantees and subgrantees when required by Federal grant program legislation). All rulings and interpretations of the Davis-Bacon Act contained in 29 CFR Part 5 are incorporated by reference in this MCCA. As applied to this MCCA, the Davis-Bacon Act (40 U.S.C. 276a-276a-7) provides that contracts in excess of \$2,000 to which the Federal Government provides assistance funding for construction, alteration, or repair (including painting and decorating) of public buildings or public works within the United States, shall contain a provision that no laborer or mechanic employed directly upon the site of the work shall receive less than the prevailing wage rates as determined by the U.S. Secretary of Labor.~~

Section 815. National Historic Preservation. (*Any construction, acquisition, modernization, or other activity that may impact a historic property.*)

The State covenants and agrees to identify to the awarding agency any property listed or eligible for listing on the National Register of Historic Places that will be affected by this award, and to provide any help the awarding agency may need, with respect to this award, to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470, *et seq.*), as implemented by the Advisory Council on Historic Preservation regulations at 36 CFR Part 800 and Executive Order 11593 (3 CFR, 1971-1975 Comp., p. 559).

(36 CFR Part 800 requires Grants Officers to get comments from the Advisory Council on Historic Preservation before proceeding with Federally assisted projects that may affect properties listed on or eligible for listing on the National Register of Historic Places.)

Section 816. Hatch Act.

The State covenants and agrees to comply with the Hatch Act (5 U.S.C. 1501 - 1508 and 7324 - 7326), as implemented by the Office of Personnel Management at 5 CFR Part 151, which limits political activity of employees or officers of State or local governments whose employment is connected to an activity financed in whole or part with Federal funds.

Section 817. Equal Employment Opportunity. *(All construction contracts awarded in excess of \$10,000 by grantees and their contractors or subgrantees.)*

The State covenants and agrees to comply with Executive Order 11246 of September 24, 1965 entitled "Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967 and as supplemented in Department of Labor regulations (41 CFR Chapter 60).

Section 818. Cargo Preference. *(Any agreement under which international air travel may be supported by U.S. Government funds.)*

The State covenants and agrees that it will comply with the Cargo Preference Act of 1954 (46 USC 1241), as implemented by Department of Transportation regulations at 46 CFR 381.7, which require that at least 50 percent of equipment, materials or commodities procured or otherwise obtained with U.S. Government funds under this Grant, and which may be transported by ocean vessel, shall be transported on privately owned U.S. flag commercial vessels, if available.

Section 819. Preservation of Open Competition and Government Neutrality Towards Government Contractors' Labor Relations on Federal and Federally Funded Construction Projects.

The State covenants and agrees that it will comply with Executive Order 13202 of February 17, 2001, Preservation of Open Competition and Government Neutrality Towards Government Contractors' Labor Relations on Federal and Federally Funded Construction Projects, as amended on April 6, 2001.

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DEARNG SECURITY REQUIREMENTS & PROCEDURES

The Delaware Army National Guard (DEARNG) has mandated adherence to all sections identified and The Delaware Army National Guard (DEARNG) has mandated adherence to all sections identified and defined in TAB 1 to Appendix 1 (Force Protection Guidance for Contracting) to Annex I (Service Support) to the DNG Antiterrorism Plan FY22. A copy of this document is included herewith.

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DENG ANTITERRORISM PLAN FY 22

TAB 1 to APPENDIX 1 (FORCE PROTECTION GUIDANCE FOR CONTRACTING)
to ANNEX I (SERVICE SUPPORT) to DENG ANTITERRORISM PLAN FY 22

DEARNG SECURITY REQUIREMENTS & PROCEDURES

1. REQUIREMENTS

The DEARNG facilities has issued regulations to be observed by all Contractors, their subcontractors (if any), employees and other firms providing services for or otherwise assigned to, or working on, the Project in order to minimize disruption to daily operations, maintain security and to facilitate the construction processes. While working inside DEARNG facilities on a regular or an occasional basis, it must be clearly understood that DEARNG security requirements will at all times take precedence over construction operations. The Contractor shall comply with all such regulations and consider the regulations when preparing his/her bid.

2. WORKING AT A DELAWARE NATIONAL GUARD INSTALLATIONS

a. In order for the DEARNG to ensure security on the job site, the Prime Contractor shall submit a list of all proposed workers who will be working on the site, to the DEANRG Contracting Officer after project has been awarded during the pre-construction meeting, including their name, social security number, age, sex, and date of birth. This list shall include all sub-contractors (if any), and any vendors requiring access to facilities during project construction of the DEARNG facilities. The Contracting Officer will submit a list to the Director of Military Support for review. The Director of Military Support will have background checks conducted and will provide the contracting officer with an approved, or rejected, personnel list. All badges and accesses will be issue by Director of Military Support.

b. Workers will not be permitted in DENG Facilities without approval and proper identification.

c. All tools, equipment, and supplies, shall be removed from the facilities daily or secured in a pre-approved containment system approved by the contracting officer.

d. Weapons of any type are not permitted.

e. Contractors shall include, in their bid, a sufficient amount of time to enter and depart the facility each day. Past projects being completed during increased security levels at a DENG facility may take between one half to one hour to enter or leave the facility.

f. Contractor is also advised that only limited movement will be permitted while inside the DENG facilities.

g. Contractors are requested to notify the Contracting Officer upon arrival and termination of worker's services in order that the identification card on file can be pulled and rendered inactive.

h. Completion of "A" Short Form is required for all employees (see next page for "A" Short Form).

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**DEARNG –GCAPL 22-06 BUY AMERICA PREFERENCE IN FEDERAL FINANCIAL
ASSISTANCE PROGRAM FOR INFRASTRUCTURE**

The Delaware Army National Guard (DEARNG) has mandated adherence to all sections identified and defined in “GCAPL 22-06 Initial Implementation Guidance on application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure” as part of the contractual conditions for this project. A copy of this document is included within.

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NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1382

10 May 2022

MEMORANDUM FOR SEE DISTRIBUTION

Subject: Grants and Cooperative Agreements Policy Letter, 22-06, Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.

Reference: Memorandum from the Office of Management and Budget, 18 April 2022, M-22-11

1. Grants and Cooperative Agreements Policy Letter (GCAPL) 22-06 implements Memorandum from the Office of Management and Budget, 18 April 2022, M-22-11.
2. GCAPL 22-06 directs that all NGB cooperative agreements will comply with Infrastructure Investment and Jobs Act ("IIJA"), Pub. L. No. 117-58, which includes the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, §§ 70901-52. in the terms and conditions of the Master Cooperative Agreement.
3. Section 809 of the Master Cooperative Agreement will be modified as follows:

~~**Section 809. Buy American Act.**~~

~~—The state covenants and agrees that it will not expend any funds appropriated by Congress without complying with The Buy American Act (41 U.S.C.10a et seq.). The Buy American Act gives preference to domestic end products and domestic construction material. In addition, the Memorandum of Understanding between the United States of America and the European Economic Community (EEC) on Government Procurement, and the North American Free Trade Agreement (NAFTA), provide that EEC and NAFTA end products and construction materials are exempted from application of the Buy American Act.~~

Section 809. The Infrastructure Investment and Jobs Act ("IIJA").

Pub. L. No. 117-58, which includes the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, §§ 70901-52. The Act strengthens Made in America Laws and will bolster America's industrial base, protect national security, and support high-paying jobs. The Act requires that the head of each Federal agency shall ensure that "none of the funds made available for a Federal financial assistance program for infrastructure may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States."

Grants and Cooperative Agreements Policy Letter, 22-06, Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.

4. NGB is currently coordinating with ODASA(P) to outline the waiver process and will notify the enterprise once it is implemented.

5. GCAPL 22-06 applies to all new awards made on or after May 14, 2022, and any amendments to awards obligating additional funds to existing awards that are executed on or after May 14, 2022.

6. GCAPL 22-06 is a change to the general terms and conditions. Modifications must be executed through appropriate process.

7. Point of contact is Darcy Ostrander-Damon; Division Chief, NGB-AQ-A; email darcy.a.ostrander-damon.civ@army.mil

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David M. Vanuch
Director of Acquisition Operations &
Senior Contracting Official

Attachment
As stated

Distribution
USPFO each state/territory/district
GOR each state/territory/district
OPR- PMs
NGB-OGC
NG-J8

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**DEARNG –GCAPL 22-06 BUY AMERICA PREFERENCE IN FEDERAL FINANCIAL
ASSISTANCE PROGRAM FOR INFRASTRUCTURE**

The Delaware Army National Guard (DEARNG) has mandated adherence to all sections identified and defined in “GCAPL 22-06 Initial Implementation Guidance on application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure” as part of the contractual conditions for this project. A copy of this document is included within.

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DEARNG – GCAPL 23-02 BUILD AMERICA BUY AMERICA WAIVER PROCESS

The Delaware Army National Guard (DEARNG) has mandated adherence to all sections identified and defined in “GCAPL 23-02 Build America, Buy America Waiver Process” for process for NGB grants and cooperative agreements and applying for a Waiver. A copy of this document is included within.

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NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1382

2 December 2022

MEMORANDUM FOR SEE DISTRIBUTION

Subject: Grants and Cooperative Agreements Policy Letter, 23-02, Build America, Buy America Waiver process

1. Grants and Cooperative Agreements Policy Letter (GCAPL) 23-02 establishes the Build America, Buy America (BABA) waiver process for NGB grants and cooperative agreements.

2. The BABA (Pub. L. No. 117-58, §§ 70901-52) requires recipients of NGB's Cooperative Agreements that include infrastructure projects ensure all:

a. Iron and steel used in the project(s) are produced in the United States. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

b. Manufactured products used in the project are produced in the United States. This means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation.

c. Construction materials are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States. This guidance applies to all Federal financial assistance, as defined in section 200.1 of title 2, Code of Federal Regulations, where funds are appropriated or otherwise made available and used for a project for infrastructure. Federal financial assistance means assistance that non-Federal entities receive or administer in the form of grants, cooperative agreements, non-cash contributions or donations of property, direct assistance, loans, loan guarantees, and other types of financial assistance.

3. The term "non-Federal entity" includes States, local governments, territories, Indian tribes, Institutions of Higher Education (IHE), and nonprofit organizations.

4. The definition of "infrastructure" encompasses public infrastructure projects. Thus, the term "infrastructure" includes, at a minimum, the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and

wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Agencies should treat structures, facilities, and equipment that generate, transport, and distribute energy -including electric vehicle (EV) charging -as infrastructure.

5. When determining if a program has infrastructure expenditures, Federal agencies should interpret the term “infrastructure” broadly and consider the definition provided above as illustrative and not exhaustive.

6. Waivers- in accordance with Section 70914 (b) of the Act, agencies may waive the Buy America domestic content procurement preference requirements if NGB finds that:

a. Applying the domestic content procurement preference would be inconsistent with the public interest (Public Interest/General Applicability Waiver)

b. Types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality (Non-Availability Waiver); or

c. The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent (Unreasonable Cost Waiver).

7. Individual waiver requests must include the following information:

a. Type of individual waiver requested- Unreasonable Cost Waiver or Non-Availability Waiver

b. Recipient name and Unique Entity Identifier (UEI)

c. NGB Cooperative Agreement Federal Award Identification Number (FAIN)

d. Project title

e. Federal funding amount- List both AFP and what has been obligated on the cooperative agreement.

f. Total cost of infrastructure project expenditures- This amount may be different from the total approved funding amount of the cooperative agreement and is inclusive of the required cost share for that project

g. List of iron or steel item(s), manufactured products, and/or construction material(s) proposed to be excepted from Buy America requirements, including name, cost, country/countries of origin (if known), required quantity and quality, and relevant Product Service Code (PSC) or North American Industry Classification System (NAICS) code for each product/material

h. Certification that your organization made a good faith effort to solicit bids for iron or steel item(s), manufactured products, and/or construction material(s) in an attempt to comply with BABA requirements. Examples of supporting information to show the attempt was made would be the following:

(1) BABA language in requests for proposals, contracts, and non-proprietary communications with the prime contractor

(2) A comparison of the total cost of the project with iron or steel item(s), manufactured products, and/or construction material(s), to the overall cost of the project with iron or steel item(s), manufactured products, and/or construction material(s). The comparison must clearly identify the materials and/or products.

(3) Market research that demonstrates a reasonable survey of the market, such as a description of the process for identifying suppliers, a list of contacted suppliers, and/or relevant excerpts from the bids documents or quotes used to complete the comparison

(4) Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials

(5) A statement from the prime contractor and/or supplier confirming the non-availability of the domestic iron or steel item(s), manufactured products, and/or construction material(s), for which the waiver is sought

(6) The absence of any BABA compliant bids received in response to a solicitation

(7) A description of the anticipated impact (on costs, project schedule, etc.) if no waiver is issued.

8. NGB-AQ-A-has submitted to Deputy Assistant Secretary for the Army (Procurement) (DASA(P)) obtain a Public Interest/General Waiver retroactive to May 14, 2022, through to 1 October 2023 to allow the field time to determine their abilities and needs around these new requirements.

9. Waiver Process:

a. The recipient submits the waiver request through the Cooperative Program Manager to United States Property and Fiscal Officer (USPFO)/Grants Officer details and justification of why they are requesting a waiver, with one of the above justifications.

b. The USPFO reviews the waiver request and submits it with a recommendation to NGB-AQ-A.

- c. NGB-AQ-A reviews the waiver request and forwards it to DASA(P) with a recommendation.
- d. DASA(P) reviews the waiver request and forwards it to Office of the Secretary of Defense (OSD) with a recommendation.
- e. OSD reviews the waiver request and forwards it to the Office of Management and Budget (OMB).
- f. OMB reviews the waiver request and sends it back through OSD to DASA(P) for public posting.
- g. Public comment will be open for a minimum of 15 days (General Applicability Waivers -30 days).
- h. DASA(P) will work with NGB-AQ-A to adjudicate any issues with public comments.
- i. Any major changes will need to be reposted publicly for an additional 15 days (General Applicability Waivers -30 days),
- j. DASA(P) submits the final waiver request with public review to the OMB website for final approval from OMB.
- k. OMB reviews and approves or disapproves the request and returns their response to DASA(P).

10. Warranting authority flows from DASA(P) so in these matters it has been determined the Head of Agency will be the SECARMY who will then sign any approved waivers.

11. Point of contact is Darcy Ostrander-Damon; Division Chief, NGB-AQ-A; email darcy.a.ostrander-damon.civ@army.mil

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David M. Vanuch
 Director of Acquisition Operations &
 Senior Contracting Official

DISTRIBUTION:
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SECTION 00 81 13
GENERAL REQUIREMENTS

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14. TERMINATION OR SUSPENSION OF THE CONTRACT

ARTICLE 1: GENERAL

1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.1.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor’s own risk and cost.

1.2 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.2.1 For Public Works Projects financed in whole or in part by state appropriation the Contractor agrees that during the performance of this contract:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin.”

ARTICLE 2: OWNER

(NO ADDITIONAL GENERAL REQUIREMENTS – SEE SUPPLEMENTARY GENERAL CONDITIONS)

ARTICLE 3: CONTRACTOR

3.1 Schedule of Values: The successful Bidder shall within twenty (20) days after receiving notice to proceed with the work, furnish to the Owner a complete schedule of values on the various items comprising the work.

- 3.2 Subcontracts: Upon approval of Subcontractors, the Contractor shall award their Subcontracts as soon as possible after the signing of their own contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the work will not be delayed by failure of materials to arrive on time.
- 3.3 Before commencing any work or construction, the General Contractor is to consult with the Owner as to matters in connection with access to the site and the allocation of Ground Areas for the various features of hauling, storage, etc.
- 3.4 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions.
- 3.5 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.
- 3.6 The Contractor warrants to the Owner that materials and equipment furnished will be new and of good quality, unless otherwise permitted, and that the work will be free from defects and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, may be considered defective. If required by the Owner, the Contractor shall furnish evidence as to the kind and quality of materials and equipment provided.
- 3.7 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.
- 3.8 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The Contractor shall promptly notify the Owner if the Drawings and Specifications are observed to be at variance therewith.
- 3.9 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.
- 3.10 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project all waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. The Contractor shall be responsible for returning all damaged areas to their original conditions.
- 3.11 STATE LICENSE AND TAX REQUIREMENTS
- 3.11.1 Each Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, "the Contractor shall furnish the Delaware Department of Finance within ten (10) days after entering into any contract

with a contractor or subcontractor not a resident of this State, a statement of total value of such contract or contracts together with the names and addresses of the contracting parties.”

- 3.12 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.
- 3.13 During the contract Work, the Contractor and each Subcontractor, shall implement an Employee Drug Testing Program in accordance with OMB Regulation 4104 - “Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on “Large Public Works Projects”. “Large Public Works” is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT SURETY

4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.

4.1.3 Contents of Performance Bonds – The bond shall be in the form approved by the Office of Management and Budget. The bond shall be conditioned upon the faithful compliance and performance by the successful bidder of each and every term and condition of the contract and the proposal, plans, specifications, and bid documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid documents and the specifications, including the payment in full to every person furnishing material or performing labor in the performance of the Contract, of all sums of money due the person for such labor and material. (The bond shall also contain the successful bidder’s guarantee to indemnify and save harmless the State and the agency from all costs, damages and expenses growing out of or by reason of the Contract in accordance with the Contract.)

4.1.4 Invoking a Performance Bond – The agency may, when it considers that the interest of the State so requires, cause judgement to be confessed upon the bond.

4.1.5 Within twenty (20) days after the date of notice of award of contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate.

4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that

the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Owner shall have the right to demand that the proof parties signing the bonds are duly authorized to do so.

4.2 FAILURE TO COMPLY WITH CONTRACT

4.2.1 If any firm entering into a contract with the State, or Agency that neglects or refuses to perform or fails to comply with the terms thereof, the Agency which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with this Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursuing additional remedies as otherwise provided by law.

4.3 CONTRACT INSURANCE AND CONTRACT LIABILITY

4.3.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the State, any Agency, officer and/or employee of the State, for and from all claims of liability which is or may be the result of the successful Bidder's actions during the performance of the Contract.

4.3.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the State, its agencies and their respective officers, employees and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the State and all agencies, officers and employees thereof shall not be financially responsible for the consequences of work performed, pursuant to said contract.

4.4 RIGHT TO AUDIT RECORDS

4.4.1 The Owner shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

4.4.2 Said books and records shall be maintained by the Contractor for a period of seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) years from the date of final payment under the Subcontract.

ARTICLE 5: SUBCONTRACTORS

5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts for the construction, reconstruction, alteration or repair of any public building (not a road, street or highway) shall be subject to the following provisions:

1. A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.
 2. A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:
 - A. It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;
 - B. That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and
 - C. That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.
- 5.1.2 The decision of the awarding Agency as to whether a Bidder who list itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders, and no action of any nature shall lie against any awarding agency or its employees or officers because of its decision in this regard.
- 5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.
- 5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:
- A. Is unqualified to perform the work required;
 - B. Has failed to execute a timely reasonable Subcontract;
 - C. Has defaulted in the performance on the portion of the work covered by the Subcontract; or
 - D. Is no longer engaged in such business.
- 5.1.5 Should a Bidder be awarded a contract, such successful Bidder shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works

contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.1.6 The Contractor may employ additional Subcontractors on the jobsite only after submitting a copy of the Subcontractor's Employee Drug Testing Program to the Owner for approval. A Contractor or Subcontractor shall not commence work until the Owner has concluded its review and determined that the submitted Employee Drug Testing Program complies with OMB Regulation 4104.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All penalty amounts assessed and not refunded or remitted to the contractor shall be reverted to the State.

*one (1) percent of contract amount not to exceed \$10,000

5.3 ASBESTOS ABATEMENT

5.3.1 The selection of any Contractor to perform asbestos abatement for State-funded projects shall be approved by the Office of Management and Budget, Division of Facilities Management pursuant to Chapter 78 of Title 16.

5.4 STANDARDS OF CONSTRUCTION FOR THE PROTECTION OF THE PHYSICALLY HANDICAPPED

5.4.1 All Contracts shall conform with the standard established by the Delaware Architectural Accessibility Board unless otherwise exempted by the Board.

5.5 CONTRACT PERFORMANCE

5.5.1 Any firm entering into a Public Works Contract that neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond.

ARTICLE 6: CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other Projects at the same site.

6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

ARTICLE 7: CHANGES IN THE WORK

7.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Professional, as the duly authorized agent, the Contractor and the Owner.

7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.

7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor and the Architect. In all cases, this cost or credit shall be based on the ‘DPE’ wages required and the “invoice price” of the materials/equipment needed.

7.3.1 “DPE” shall be defined to mean “direct personnel expense”. Direct payroll expense includes prevailing wage rates plus a maximum multiplier of 1.35 times DPE. For example, if the prevailing wage rate is \$50/hour, the DPE would be \$67.50/hour (50 x 1.35).

7.3.2 “Invoice price” of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor, (or subcontractor), to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the “Means Building Construction Cost Data” publication.

7.3.3 In addition to the above, the General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor’s own forces. For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven and one half percent (7.5%) on the subcontractors work. These mark-ups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc. No markup is permitted on the work of the subcontractors subcontractor. No additional costs shall be allowed for changes related to the Contractor’s onsite superintendent/staff, or project manager, unless a change in the work changes the project duration and is identified by the CPM schedule. There will be no other costs associated with the change order.

ARTICLE 8: TIME

8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.

- 8.2 If progress of the Work is delayed at any time by changes ordered by the Owner, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner may determine.
- 8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, or the occupancy of the building by the Owner, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility
- 8.4 SUSPENSION AND DEBARMENT
- 8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, "Any Contractor who fails to perform a public works contract or complete a public works project within the time schedule established by the Agency in the Invitation To Bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project."
- 8.4.2 "Upon such failure for any of the above stated reasons, the Agency that contracted for the public works project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the public works project within the time schedule established by the Agency and failed to do so for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record."
- 8.5 RETAINAGE
- 8.5.1 Per Section 6962(d)(5) a.3, Title 29, Delaware Code: The Agency may at the beginning of each public works project establish a time schedule for the completion of the project. If the project is delayed beyond the completion date due to the Contractor's failure to meet their responsibilities, the Agency may forfeit, at its discretion, all or part of the Contractor's retainage.
- 8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Architect and Contractor. Once the punchlist is prepared, all three parties will by mutual agreement, establish a schedule for its completion. Should completion of the punchlist be delayed

beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 APPLICATION FOR PAYMENT

9.1.1 Applications for payment shall be made upon AIA Document G702. There will be a five percent (5%) retainage on all Contractor's monthly invoices until completion of the project. This retainage may become payable upon receipt of all required closeout documentation, provided all other requirements of the Contract Documents have been met.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice.

9.2 PARTIAL PAYMENTS

9.2.1 Any public works Contract executed by any Agency may provide for partial payments at the option of the Owner with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the contract.

9.2.2 When approved by the agency, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the work yet to be completed, provided acceptable provisions have been made for storage.

9.2.2.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Agency, receipted bills from all Contractors, Subcontractors, and material, men, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner.

9.3 SUBSTANTIAL COMPLETION

9.3.1 When the building has been made suitable for occupancy, but still requires small items of miscellaneous work, the Owner will determine the date when the project has been substantially completed.

9.3.2 If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and

accepted. Such payment shall be made under the terms and conditions governing final payment that it shall not constitute a waiver of claims.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of substantial completion.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the five percent (5%) retainage if determined appropriate, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

9.4.1.1 Evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid,

9.4.1.2 An acceptable RELEASE OF LIENS,

9.4.1.3 Copies of all applicable warranties,

9.4.1.4 As-built drawings,

9.4.1.5 Operations and Maintenance Manuals,

9.4.1.6 Instruction Manuals,

9.4.1.7 Consent of Surety to final payment.

9.4.1.8 The Owner reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws ordinances, rules regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Owner in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against exposure or environmental pollution, to comply with applicable regulation laws and

ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Contractor and Architect in writing the area has been cleared and approved by the authorities in order for the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

- 10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials that may be defined as hazardous, must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a warning caution on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.
- 10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

ARTICLE 11: INSURANCE AND BONDS

- 11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.
- 11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Owner, within 20 days of contract award.
- 11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Owner.
- 11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this project.
- 11.5 Builders Risk (including Standard Extended Coverage Insurance) on the existing building during the entire construction period, may be provided by the Contractor under this contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 Contractor's Contractual Liability Insurance

Minimum coverage to be:

Bodily Injury	\$1,000,000	for each occurrence
	\$3,000,000	aggregate
Property Damage	\$1,000,000	for each occurrence
	\$3,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury	\$1,000,000	for each occurrence
	\$3,000,000	aggregate
Property Damage	\$1,000,000	for each occurrence
	\$3,000,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	\$1,000,000	for each person
	\$1,000,000	for each occurrence
Property Damage	\$500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

11.7.5.1 Minimum Limit on employer's liability to be as required by law.

11.7.5.2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates.

11.7.7 Social Security Liability

11.7.7.1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

11.7.7.2 Upon request, the Contractor shall furnish Owner such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.

11.7.7.3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of two years from the date of Substantial Completion, or by terms of an applicable special warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.

12.2 At any time during the progress of the work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Owner, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the contract as they consider justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 CUTTING AND PATCHING

13.1.1 The Contractor shall be responsible for all cutting and patching. The Contractor shall coordinate the work of the various trades involved.

13.2 DIMENSIONS

13.2.1 All dimensions shown shall be verified by the Contractor by actual measurements at the project site. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the Owner for adjustment before any work affected thereby has been performed.

13.3 LABORATORY TESTS

13.3.1 Any specified laboratory tests of material and finished articles to be incorporated in the work shall be made by bureaus, laboratories or agencies approved by the Owner and reports of such tests shall be submitted to the Owner. The cost of the testing shall be paid for by the Contractor.

13.3.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Owner.

13.4 ARCHAEOLOGICAL EVIDENCE

13.4.1 Whenever, in the course of construction, any archaeological evidence is encountered on the surface or below the surface of the ground, the Contractor shall notify the authorities of the State Historic Preservation Office and suspend work in the immediate area for a reasonable time to permit those authorities, or persons designated by them, to examine the area and ensure the proper removal of the archaeological evidence for suitable preservation by the Division of Historical and Cultural Affairs.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The General Contractor shall replace without expense to the Owner all glass broken during the construction of the project. If job conditions warrant, at completion of the job the General Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of two (2) years from the date of substantial completion, as evidenced by the date of final acceptance of the work, the contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or workmanship performed by the contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than two (2) years, shall take precedence over the above warranties. The contractor shall remedy, at his own expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

13.7 REPORTING

13.7.1 Contractor who is awarded contract must report contract amounts awarded to all listed subcontractors. Information to report is included in the chart below. If subcontractor is registered as a minority, women or veteran owned business, please indicate in space provided.

Subcontractor Category	Subcontractor Name	Subcontractor Contract Amount	Is subcontractor minority, women or veteran owned?

13.8 BUY AMERICAN ACT

- 13.8.1 Section 810 of Article VIII (included elsewhere in this Project Manual,) requires compliance with the Buy American Act (41 U.S.C. 10.) The Buy American Act gives preference to domestic end products and domestic construction materials. To verify compliance with this Section, Contractor is required to provide proof, acceptable to the Owner, that all major equipment and materials installed on the project was manufactured in the United States.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

- 14.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform a provision of the Contract, the Owner, after seven days written notice to the Contractor, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Alternatively, at the Owner's option, and the Owner may terminate the Contract and take possession of the site and of all materials, equipment, tools, and machinery thereon owned by the Contractor and may finish the Work by whatever method the Owner may deem expedient. If the costs of finishing the Work exceed any unpaid compensation due the Contractor, the Contractor shall pay the difference to the Owner.
- 14.2 “If the continuation of this Agreement is contingent upon the appropriation of adequate state, or federal funds, this Agreement may be terminated on the date beginning on the first fiscal year for which funds are not appropriated or at the exhaustion of the appropriation. The Owner may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Owner will cease upon the date of termination. Notwithstanding the foregoing, the Owner agrees that it will use its best efforts to obtain approval of necessary funds to continue the Agreement by taking appropriate action to request adequate funds to continue the Agreement.”

END OF SECTION 00 81 13

SECTION 00 81 14

DRUG TESTING REPORT FORM

The Office of Management and Budget (OMB) has developed the 4014 regulation as part of the Delaware Code that requires Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds pursuant to 29 Del.C 6908(a)(6). The regulations established the mechanism, standards and requirements of a Mandatory Drug Testing Program that will be incorporated by reference into this Contract awarded pursuant to 29 Del.C 6962. Sample copies of Testing Report Forms maintained and/or submitted pursuant to the requirements of 4104 regulation for this Project are including herewith.

END OF SECTION

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EMPLOYEE DRUG TESTING REPORT FORM

Period Ending: _____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds maintain testing data that includes but is not limited to the data elements below.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Number of employees who worked on the jobsite during the report period: _____

Number of employees subject to random testing during the report period: _____

Number of Negative Results _____ Number of Positive Results _____

Action taken on employee(s) in response to a failed or positive random test:

Date: _____

This form is not required to be submitted to the Owner. Included as a reference to show information required to be maintained by the Contractor. The Owner shall have the right to periodically audit all Contractor and Subcontractor test results at the Contractor's or Subcontractor's offices (or by other means to make the data available for inspection by the Owner).

**EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds to notify the Owner in writing of a positive random drug test.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Name of employee with positive test result: _____

Last 4 digits of employee SSN: _____

Date test results received: _____

Action taken on employee in response to a positive test result:

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

This form shall be sent by mail to the Owner within 24 hours of receipt of test results.

Enclose this test results form in a sealed envelope with the notation "Drug Testing Form – DO NOT OPEN" on the face thereof and place in a separate mailing envelope.

**TRANSIENT TRAINING OFFICER BARRACKS
DELAWARE ARMY NATIONAL GUARD
BETHANY BEACH TRAINING SITE
163 SCANNELL BLVD.
BETHANY BEACH, DELAWARE
DEARNG CONTRACT NO.: 2020-16**

**AFFIDAVIT OF
CRAFT TRAINING COMPLIANCE**

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training must be provided by a contractor and/or subcontractor for each craft on a project for which there are Delaware Department of Labor approved and registered training programs or, if the contractor and/or subcontractor meets the requirements under Title 29, Chapter 69, Section 6960A.(b)(1)c.1.-3., payment may be made in accordance with Title 29, Chapter 69, Section 6960A.(b)(1)d. A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at:

<https://laborfiles.delaware.gov/main/det/apprenticeship/DE%20Craft%20Training%20Occupation%20List%20Effective%20March%201%202022.pdf>. If you have questions regarding craft training programs, please submit all questions in writing to the Delaware Department of Labor at: apprenticeship@delaware.gov. ***This Affidavit of Craft Training Compliance must be submitted prior to contract execution.***

In accordance with Title 29, Chapter 69, Section 6960A.(a)(1), a contract relating to a public works project under § 6962 of Title 29 must include a craft training program for each craft in the project if at the time the contractor executes a public works contract, all of the following apply:

- a. A project meets the prevailing wage requirement under Section 6960 of Title 29.
- b. The contractor employs 10 or more total employees.
- c. The project is not a federal highway project, except for the project under Section 6962(c)(11) of Title 29.
- d. There is an apprenticeship program for a craft in the project on the list of crafts under Section 204(b)(2) of Title 19.

Pursuant to Title 29, Chapter 69, Section 6960A.(a)(2), ***a contractor must commit that all subcontractors provide craft training*** if paragraph (a)(1) of this section applies to the subcontractor. Failure to provide required craft training or payment on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6960A.(d)(1)-(3).

Craft(s): _____

Contractor Name: _____

Contractor Address: _____

Contractor Program

Registration Number(s) _____

On this line also indicate whether DE, Other State (identify) or US Registration Number

Or

A payment has been made in the amount established under Section 204(b)(2)b.2. of Title 19, for the craft into the Delaware Department of Labor’s Apprenticeship and Training Fund.

Or

Craft Training requirements are not applicable because:

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

State of Delaware)
)
County of _____) **ss:**

Before me, a notary public, in and for said county and state, personally appeared, _____, who acknowledged to me that she/he did execute the foregoing instrument on behalf of _____.

IN TESTIMONY WHEREOF, I have subscribed my name and affixed my official seal this ____ day of _____ 20__.

Notary Public
Commission Expires _____

THIS PAGE MUST BE SIGNED AND NOTARIZED TO BE CONSIDERED.

01 02 00.00 48

STATE OF WORK

SECTION 01 02 00.00 48 – STATEMENT OF WORK

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PART 1

DESIGN OBJECTIVES, AND FUNCTIONAL AND AREA REQUIREMENTS

1.1 **SCOPE OF WORK.** The objective of this solicitation is to obtain a facility in which the Senior Leaders' Quarters (SLQ) are able to effectively implement their Army National Guard support and training missions. These activities require sufficient space with up-to-date furnishings and equipment to support the Units' full-time and Army National Guard personnel. The facility will be constructed on DEARNG's property at 163 Scannell Blvd, Bethany Beach DE.

1.1.1 Requirements stated in this RFP are minimums; design and construction shall meet or exceed the requirements. The design and technical criteria contained and cited in this RFP establish minimum standards for design and construction quality. Innovative, creative, and life cycle cost effective solutions which meet or exceed these requirements are encouraged.

1.1.2 This project shall consist of the Design and Construction of an SLQ facility on DEARNG's Bethany Beach Facility in Sussex County, Delaware. following (see the building program tables at the end of this section for required structure square footages):

1.1.2.1 **DESIGN CONCEPTS:** As outlined in the Part 06 Architectural and Interior Design Narrative Paragraph 6.1, this RFP and the associated drawings, provides two distinct design concepts for solving the program for this facility. Both concepts are viable and acceptable solutions for this project. DEARNG has selected two separate locations on their Bethany Facility for each of these concepts. The BD team shall identify in their proposal's introduction, which of the concepts they plan to construct.

One concept is a new two story single building, 11,977 GSF, that accommodates the full program, including 32 SLQ suits (Bedroom and Bathroom), and shall be referred to as the "Motel Concept" (MC). The other concept is an assembly of six separate structures ("Units") arranged side by side, with eight SLQ rooms each. These buildings are on raised piles, so each building is paired with an adjacent partner to share an exterior deck access stairs, and ramp in the case of the one accessible building ("HC Unit").

1.1.2.2 Providing all required, program function utilities, storm drainage, communications, electric, HVAC, fire protection/alarm systems, IDS, EMCS, force protection measures, paving, walks, curbs, parking, access, exterior lighting, site improvements, grading and landscaping

1.1.3 Contractor shall provide a design compatible with furniture and some equipment to be purchased and installed by the Government.

1.1.4 Contractor shall provide a construction management software system (Procore, e-Builder, Prolog, Buildingblok, or equal) to manage RFIs, Submittals, design review, schedule, discussions, etc. The contractor shall provide the Government with

1.2.4 **Design Freedom.** Requirements stated in this RFP are minimums. Innovative, creative, or cost-saving proposals, which meet or exceed these requirements are encouraged, and will be considered more favorably.

1.2.4.1 The project conceptual design was developed by the Army National Guard, and an A/E design team; this conceptual design is accepted by the Government.

1.2.4.2 The conceptual design Drawings, this Statement of Work, and the Outline Technical Specifications, along with the other information and requirements in this RFP, serve as requirements for Contractor building design and construction completion, along with other code, regulatory and professional practice requirements. The extent of development of these RFP documents in no way relieves the successful offeror from responsibility for completing the design, construction documentation, and construction of the facility in conformance with Applicable Criteria and codes.

1.2.4.3 The conceptual design illustrates desired general arrangements, orientation, and adjacencies, and provides an exterior image which is acceptable to the Government – The provided layout and design have been vetted and accepted by DEARNG, but it is not intended as a dictated final layout. The Contractor's designers shall develop and refine the conceptual site and building designs in their completion of the design and construction documents. Such development shall be consistent with the criteria and acceptable to the Government.

1.2.4.3.1 Numbers, sizes and locations of doors and windows indicated on the conceptual elevations in this RFP are not intended to dictate the final fenestration design

1.2.4.3.2 Design building to enhance or complement the visual environment of the site. The design shall reflect a human scale, and primary entrances shall be architecturally designed for easy visibility. Exterior materials, roof forms, and detailing shall be compatible with surrounding development and adjacent buildings and shall follow established architectural themes. Exterior colors shall conform to the onsite Fitness center building currently in construction. Use architectural elements to reflect human scale, break up building massing and roof lines, and add visual interest, such as stringcourses, reveals, corbels/cornices to produce shadow lines, stone or pre-cast sills and similar elements, dormers, inserts, detailing, etc.

1.2.4.4 The Contractor shall accommodate minor site and building plan changes by the Government in the early stages of the design process, as a normal part of the design development process. The Contractor may adjust spaces, within the overall and specific functional area guidelines, as required to accommodate structural layout, and as necessary to provide adequate space for mechanical, electrical and communication spaces. The mechanical and electrical spaces must provide adequate space to accommodate equipment operation and maintenance safely and efficiently. The spatial relationships and adjacencies in the RFP drawings, however, must be maintained, unless the Contractor recommends changes to the Government, and the Government accepts such changes.

1.2.4.5 The Contractor shall develop and refine the exterior image and aesthetics of the building as part of the design development process. The Contractor shall utilize

materials, detailing, fenestration, lighting, and ornamentation to develop a high-quality exterior image for the facility.

1.2.4.6 The Contractor's architect or interior designer shall recommend a palette of colors and materials for building interior and exterior, that are influenced by the new Fitness center, and to produce a pleasing appearance that coordinated throughout the building.

1.2.5 **Energy and Resources Conserving Features.** Public Laws 102-486 and 109-58, Executive Order 13423, and Federal Regulations 10 CFR 435, require federal buildings to be designed and constructed to reduce energy consumption in a life-cycle, cost-effective manner using renewable energy sources when economical. Products designed to conserve energy and resources by controlling the amounts of consumed energy or by operating at increased efficiencies should be considered. Minimum requirements for this project are listed in this Statement of Work.

1.2.5.1 Energy conservation techniques shall be considered as they relate to site design, site engineering, building design, and building engineering. Techniques which conserve energy, improve functionality, and can be justified by life cycle cost analysis as cost-effective are encouraged. Integration of energy conservation systems with the building design (lighting, structure, mechanical systems, and esthetics) is essential to facilitate functionality and maximum energy savings. If an alternative energy generation method is proposed for use as the project's primary energy source, documentation shall be submitted to the Contracting Officer, verifying the system's reliability, life-cycle cost effectiveness, and ability to meet the project's peak demand.

1.2.6 **Sustainable Design.** LEED-NC v4 and UFC 1-200-02 are the Government's current criteria for sustainable design. The project shall be designed and constructed in accordance with LEED guidance. See also Part 14 of this Section and Section 01 33 29

1.2.7 **Antiterrorism and Force Protection Considerations.** Project design and construction shall comply with the Department of Defense Antiterrorism (AT) Standards for Buildings, UFC 4-010-01, and other AT criteria listed in Part 2 of this Statement of Work. The conceptual site and building design has been developed in general accordance with AT requirements. The DB team shall confer with the DEARNG's security team to confirm ATRP requirements. The threat assessment for this project is the facility requires a very low level of protection; compliance with minimum AT requirements is required. Applicable levels of protection in Table B-1 of UFC 4-010-01 are acceptable. Contractor shall continue to coordinate AT design with the Government throughout design and construction.

1.2.7.1 The Transient Training Officers Barracks is classified for ATRP as an habited Building. The applicable structural isolation requirements would need to be provided at the appropriate location if this section is considered low occupancy.

1.2.7.2 A Comprehensive protection analysis as described in DA PAM 190-51 is not required.

1.3 **CONTRACTOR RESPONSIBILITY.**

1.6 SPECIFICATIONS.

1.6.1 Contractor's designers shall provide detailed specifications in the industry standard three-part, CSI-format. Specifications shall be edited to indicate actual products to be used in the construction. Final specifications shall include as a minimum, a description of the technical requirements, criteria for determining whether the criteria are met, and quality control requirements and procedures.

1.6.2 the DB team's final specifications may be developed from UFGS (USACE-specific Section, accessible from the www.wbdg.org), or one of the industry prototype specifications such as MasterSpec.

1.6.3 In the case of the use of Modular construction, the DB team can use the Modular Manufacturers specifications for their specific modular systems components, but Contractor's design team must take complete responsibility for insuring that the modular design is both code and UFC compliant, and shall insure that these Sections are complete and suitable for representing the final design.

1.7 **SITE.** The site is described on the RFP drawings included as part of this solicitation, and consists of approximately 9.42 +/- acres. Site work includes all design and construction of site features described in the RFP, including but not limited to, site planning, clearing, grading, erosion control, site drainage, utility systems, pavements, pedestrian and vehicular circulation systems, signage, site lighting, landscaping, physical security measures, fencing, and site furnishings.

1.7.1 **Pavement.** Site improvements consist of both rigid (concrete) and flexible (bituminous asphaltic concrete) type pavements. For clarification, the following is the descriptive listing for the:

- **Flexible (bituminous asphaltic concrete) pavement** shall be placed at the following locations: All areas not specifically requiring rigid pavement including: all drive aisles, and parking lots.

1.7.2 **Environmental Considerations and Mitigation Requirements.** Should any suspected hazardous materials be encountered during site investigations or construction, the Contractor shall immediately stop work in the affected area, notify the Contracting Officer, and await Contracting Officer's direction before proceeding with additional work in the area.

1.7.2.1. **Radon Protection:** The Contractor shall incorporate passive barrier and capillary water barrier provisions. Design and construction of these barriers shall comply with the requirements of UFC 3-490-04A, Design: Indoor Radon Prevention and Mitigation.

1.7.2.2 **Mold Prevention.** Buildings must be designed and constructed to maintain space humidity at reasonable levels.

1.7.2.3 Describe any other environmental or hazardous materials issues that impact the project. Review environmental documentation for potential impacts. If termite or

other pest control is required, indicate the requirement here. The Outline Technical Specifications include Section 31 31 16.00 48.

1.7.3 **Site Development Constraints.** Site constraints are identified in Attachment N PLUS Comments and Responses.

1.7.4 **Contractor's Use of the Site.** Except for utility service provider access, required coordination with local agencies, and observation and oversight by the Government, the Contractor shall have complete use of the site within final limits of construction to be recommended by the Contractor and approved by the Government. Access to the site for the Government must be maintained at all times except as coordinated with the government in advance.

1.7.4.1 **Security and Identification Requirements.** Contractor and their subcontractors may be subject to periodic background checks by the DEARNG Physical Security office, anyone that does not pass the background check will not be allowed access to the site.

1.7.5 **Verification of Conditions.** The Contractor shall field verify existing conditions prior to beginning work. The Contractor and the designers of record shall be responsible for investigating all differing site conditions, discrepancies, and field related issues that are encountered during the design and construction process. The designers of record shall be responsible for providing guidance to the Contractor for the resolution of all such issues. The Contractor shall provide notice to the Government of any such issues prior to proceeding and with sufficient time to avoid cost or schedule impacts.

1.7.6 **Verification of Utilities.** The Contractor and the designers of record shall be responsible for verifying the condition, location, and capacity for all utilities necessary for the project. The Contractor and designers of record shall further verify that all utilities will meet the requirements of this project.

1.7.7 **Regulatory Compliance.** The Contractor shall assure that the site development complies with all applicable local, State and Federal regulations. A list of known regulations is located in Part 2 of this Statement of Work. Timely acquisition of the necessary design and construction related permits shall be the responsibility of the Contractor. The Contractor, upon notice to proceed, shall immediately begin working on the permits so as not to delay completion of the project. The Contractor shall prepare permits, associated drawings, public notices, and other related documentation as necessary to successfully meet permit approval status. The Contractor shall pay for associated permit fees.

1.8 **FUNCTIONAL AND AREA REQUIREMENTS.**

1.8.1 Comply with Design guides stated in section 1.2.1.1 above.

1.8.2 Mechanical rooms shall have a minimum 45 STC 45minimum acoustic performance of walls and ceiling/deck

1.8.3 The building designs shall provide building gross areas as indicated below. The building gross floor areas may not increase or decrease in size without Government approval, except for minor deviations necessary to accommodate building systems.

Gross building area shall be calculated in accordance with TI 800-01, Chapter 5, Section 1.c. The minimum gross area of the buildings is a minimum requirement of this RFP.

1.8.4 Individual spaces shall meet the functional and environmental requirements based on the design guides stated in 1.2.1.1 Room by Room Supplemental Requirements table below, as well as any applicable code requirements and additional requirements noted in this Section.

1.8.4.1 The areas shown in the "Target Area" column of the table typically allow minor variation. See NG Pam 415-12 paragraph 1-7 Flexibility for the specific allowable limitations on deviating from the functional space authorizations. Space authorizations are shown in the CSMS Program - Building Table as "Authorized Size (sf)".

1.8.4.1.1 Areas and dimensions for these spaces may not vary from the accepted conceptual design values

1.8.5 Project requirements not covered by or modified from NG PAM 415-12, DG 415-2 or 415-5 for individual areas or rooms are described in the "Additional Requirements" column in the following tables and elsewhere in this RFP.

1.9 **ARCHITECTURAL PROGRAMS (2) (SEE FOLLOWING PAGES)**

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MOTEL CONCEPT						
MOTEL CONCEPT BUILDING PROGRAM TABLE						
Room No	Room Name	Authorized Size (sf)	Plan Size (sf)	Additional Requirements	Clg. Ht.	Room Adjacency
FIRST FLOOR						
103	SLQ 3	235	174	Floor Finish - Carpet	9	102, 104
103A	SLQ 3 Bathroom		45	Floor Finish – Ceramic Tile	8	
104	SLQ 4	235	174	Floor Finish - Carpet	9	103, 105
104A	SLQ 4 Bathroom		45	Floor Finish – Ceramic Tile	8	
105	SLQ 5	235	174	Floor Finish - Carpet	9	104, 106
105A	SLQ 5 Bathroom		45	Floor Finish – Ceramic Tile	9	
106	SLQ 6	235	174	Floor Finish - Carpet	9	105, 107
106A	SLQ 6 Bathroom		45	Floor Finish – Ceramic Tile	8	
107	SLQ 7	235	174	Floor Finish - Carpet	9	106, 108
107A	SLQ 7 Bathroom		45	Floor Finish – Ceramic Tile	8	
108	SLQ 8 - ADA	235	175	Floor Finish - Carpet	9	107, 109
108A	SLQ 8 - ADA Bathroom		54	Floor Finish – Ceramic Tile	9	
109	SLQ 9 - ADA	235	175	Floor Finish - Carpet	9	108
109A	SLQ 9 – ADA Bathroom		54	Floor Finish – Ceramic Tile	8	
112	SLQ 12	235	174	Floor Finish - Carpet	9	111, 113
112A	SLQ 12 Bathroom		45	Floor Finish – Ceramic Tile	8	
113	SLQ 13	235	174	Floor Finish - Carpet	9	112, 114
113A	SLQ 13 Bathroom		45	Floor Finish – Ceramic Tile	8	
114	SLQ 14	235	174	Floor Finish - Carpet	9	113, 115
114A	SLQ 14 Bathroom		45	Floor Finish – Ceramic Tile	8	
115	SLQ 15	235	174	Floor Finish - Carpet	9	114, 116
115A	SLQ 15 Bathroom		45	Floor Finish – Ceramic Tile	8	
116	SLQ 16	235	174	Floor Finish - Carpet	9	115,117, 119
116A	SLQ 16 Bathroom		45	Floor Finish – Ceramic Tile	8	
117	Lounge/Laundry/ Vending	Lounge/ Vend: 200 Laundry: 144	106	Washer(s), Dryer(s), Laundry Sink, Vending Floor Finish - VCT	9	116,118, 119
118	IT	79 (100 needed)	101	Floor - Sealed Concrete	9	117,119
119	Mechanical/ Electrical	394	267	Floor - Sealed Concrete	9	117, 118,117, 118

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MOTEL CONCEPT						
SECOND FLOOR						
203	SLQ 19	235	174	Floor Finish - Carpet	9	202, 204
203A	SLQ 19 Bathroom		45	Floor Finish - Tile	8	
204	SLQ 20	235	174	Floor Finish - Carpet	9	203, 205
204A	SLQ 20 Bathroom		45	Floor Finish - Tile	8	
205	SLQ 21	235	174	Floor Finish - Carpet	9	204, 206
205A	SLQ 21 Bathroom		45	Floor Finish - Tile	8	
206	SLQ 22	235	174	Floor Finish - Carpet	9	205, 207
206A	SLQ 22 Bathroom		45	Floor Finish - Tile	8	
207	SLQ 23	235	174	Floor Finish - Carpet	9	206, 208
207A	SLQ 23 Bathroom		45	Floor Finish - Tile	8	
208	SLQ 24	235	174	Floor Finish - Carpet	9	207, 218
208A	SLQ 24 Bathroom		45	Floor Finish - Tile	8	
211	SLQ 27	235	174	Floor Finish - Carpet	9	210, 212
211A	SLQ 27 Bathroom		45	Floor Finish - Tile	8	
212	SLQ 28	235	174	Floor Finish - Carpet	9	211, 213
212A	SLQ 28 Bathroom		45	Floor Finish - Tile	8	
213	SLQ 29	235	174	Floor Finish - Carpet	9	212, 214
213A	SLQ 29 Bathroom		45	Floor Finish - Tile	8	
214	SLQ 30	235	174	Floor Finish - Carpet	9	213, 215
214A	SLQ 30 Bathroom		45	Floor Finish - Tile	8	
215	SLQ 31	235	174	Floor Finish - Carpet	9	214, 216
215A	SLQ 31 Bathroom		45	Floor Finish - Tile	8	
216	SLQ 32	235	174	Floor Finish - Carpet	9	215, 217
216A	SLQ 32 Bathroom		45	Floor Finish - Tile	8	

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VILLAGE CONCEPT						
VILLAGE CONCEPT BUILDING PROGRAM TABLE						
BID SCOPE	RM. #	RM. NAME	AREA	REQUIREMENTS	ADJACENT RMS.	CLG. HT.
UNIT 1						
ALT. 3	1.101	SLQ 1	155 SF	Floor Finish - CPT	102, 103, 107	9' - 0"
ALT. 3	1.102	SLQ 2	155 SF	Floor Finish - CPT	101, 104, 107	9' - 0"
ALT. 3	1.103	BATHROOM 1	86 SF	Floor Finish - CT	101, 105, 107	9' - 0"
ALT. 3	1.104	BATHROOM 2	89 SF	Floor Finish - CT	102, 106, 107	9' - 0"
ALT. 3	1.105	SLQ 3	149 SF	Floor Finish - CPT	103, 107, 111	9' - 0"
ALT. 3	1.106	SLQ 4	149 SF	Floor Finish - CPT	104, 107-109	9' - 0"
ALT. 3	1.107	CORRIDOR 1	129 SF	Floor Finish - LVT	101-106, 111	9' - 0"
ALT. 3	1.108	HW CLOSET	18 SF	Floor Finish - CONC.	105, 109, 110	9' - 0"
ALT. 3	1.109	LAUNDRY CLOSET	27 SF	Washer, Dryer, Floor Finish - VCT	105, 108, 110	9' - 0"
ALT. 3	1.11	KITCHEN	244 SF	Floor Finish - LVT	108, 109, 111, 114	9' - 0"
ALT. 3	1.111	LIVING ROOM	255 SF	Floor Finish - LVT	105, 110, 112, 113	9' - 0"
ALT. 3	1.112	HVAC CLOSET	17 SF	Floor Finish - CONC.	113, 111, 115	9' - 0"
ALT. 3	1.113	STORAGE CLOSET	19 SF	Floor Finish - VCT	111, 112, 115	9' - 0"
ALT. 3	1.114	CORRIDOR 2	139 SF	Floor Finish - LVT	115-120, 110	9' - 0"
ALT. 3	1.115	SLQ 5	151 SF	Floor Finish - CPT	112-114, 117	9' - 0"
ALT. 3	1.116	SLQ 6	151 SF	Floor Finish - CPT	110, 114, 118	9' - 0"
ALT. 3	1.117	BATHROOM 3	96 SF	Floor Finish - CT	114, 115, 119	9' - 0"
ALT. 3	1.118	BATHROOM 4	96 SF	Floor Finish - CT	114, 116, 120	9' - 0"
ALT. 3	1.119	SLQ 7	164 SF	Floor Finish - CPT	114, 117, 120	9' - 0"
ALT. 3	1.12	SLQ 8	165 SF	Floor Finish - CPT	114, 118, 119	9' - 0"
UNIT 2						
ALT. 2	2.101	SLQ 1	155 SF	Floor Finish - CPT	102, 103, 107	9' - 0"
ALT. 2	2.102	SLQ 2	155 SF	Floor Finish - CPT	101, 104, 107	9' - 0"
ALT. 2	2.103	BATHROOM 1 - ADA	86 SF	Floor Finish - CT	101, 105, 107	9' - 0"
ALT. 2	2.104	BATHROOM 2	89 SF	Floor Finish - CT	102, 106, 107	9' - 0"
ALT. 2	2.105	SLQ 3	149 SF	Floor Finish - CPT	103, 107, 111	9' - 0"
ALT. 2	2.106	SLQ 4	149 SF	Floor Finish - CPT	104, 107-109	9' - 0"
ALT. 2	2.107	CORRIDOR 1	129 SF	Floor Finish - LVT	101-106, 111	9' - 0"
ALT. 2	2.108	HW CLOSET	18 SF	Floor Finish - CONC.	105, 109, 110	9' - 0"
ALT. 2	2.109	LAUNDRY CLOSET	27 SF	Washer, Dryer, Floor Finish - VCT	105, 108, 110	9' - 0"
ALT. 2	2.11	KITCHEN	244 SF	Floor Finish - LVT	108, 109, 111, 114	9' - 0"
ALT. 2	2.111	LIVING ROOM	255 SF	Floor Finish - LVT	105, 110, 112, 113	9' - 0"
ALT. 2	2.112	HVAC CLOSET	17 SF	Floor Finish - CONC.	113, 111, 115	9' - 0"
ALT. 2	2.113	STORAGE CLOSET	19 SF	Floor Finish - VCT	111, 112, 115	9' - 0"

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ALT. 2	2.114	CORRIDOR 2	139 SF	Floor Finish - LVT	115-120, 110	9' - 0"
ALT. 2	2.115	SLQ 5	151 SF	Floor Finish - CPT	112-114, 117	9' - 0"
ALT. 2	2.116	SLQ 6	151 SF	Floor Finish - CPT	110, 114, 118	9' - 0"
ALT. 2	2.117	BATHROOM 3	96 SF	Floor Finish - CT	114, 115, 119	9' - 0"
ALT. 2	2.118	BATHROOM 4	96 SF	Floor Finish - CT	114, 116, 120	9' - 0"
ALT. 2	2.119	SLQ 7	164 SF	Floor Finish - CPT	114, 117, 120	9' - 0"
ALT. 2	2.12	SLQ 8	165 SF	Floor Finish - CPT	114, 118, 119	9' - 0"
UNIT 3						
BASE	3.101	SLQ 1	155 SF	Floor Finish - CPT	102, 103, 107	9' - 0"
BASE	3.102	SLQ 2	155 SF	Floor Finish - CPT	101, 104, 107	9' - 0"
BASE	3.103	BATHROOM 1	86 SF	Floor Finish - CT	101, 105, 107	9' - 0"
BASE	3.104	BATHROOM 2 - ADA	86 SF	Floor Finish - CT	102, 106, 107	9' - 0"
BASE	3.105	SLQ 3	149 SF	Floor Finish - CPT	103, 107, 111	9' - 0"
BASE	3.106	SLQ 4	149 SF	Floor Finish - CPT	104, 107-109	9' - 0"
BASE	3.107	CORRIDOR 1	129 SF	Floor Finish - LVT	101-106, 111	9' - 0"
BASE	3.108	HW CLOSET	18 SF	Floor Finish - CONC.	105, 109, 110	9' - 0"
BASE	3.109	LAUNDRY CLOSET	27 SF	Washer, Dryer, Floor Finish - VCT	105, 108, 110	9' - 0"
BASE	3.11	KITCHEN	248 SF	Floor Finish - LVT	108, 109, 111, 114	9' - 0"
BASE	3.111	LIVING ROOM	252 SF	Floor Finish - LVT	105, 110, 112, 113	9' - 0"
BASE	3.112	HVAC CLOSET	17 SF	Floor Finish - CONC.	113, 111, 115	9' - 0"
BASE	3.113	STORAGE CLOSET	19 SF	Floor Finish - VCT	111, 112, 115	9' - 0"
BASE	3.114	CORRIDOR 2	139 SF	Floor Finish - LVT	115-120, 110	9' - 0"
BASE	3.115	SLQ 5	151 SF	Floor Finish - CPT	112-114, 117	9' - 0"
BASE	3.116	SLQ 6	151 SF	Floor Finish - CPT	110, 114, 118	9' - 0"
BASE	3.117	BATHROOM 3	96 SF	Floor Finish - CT	114, 115, 119	9' - 0"
BASE	3.118	BATHROOM 4	97 SF	Floor Finish - CT	114, 116, 120	9' - 0"
BASE	3.119	SLQ 7	160 SF	Floor Finish - CPT	114, 117, 120	9' - 0"
BASE	3.12	SLQ 8	160 SF	Floor Finish - CPT	114, 118, 119	9' - 0"
BASE	3.121	IT	109 SF	Floor Finish - CONC.	120	9' - 0"
BASE	3.122	FACILITIES STORAGE	109 SF	Floor Finish - CONC.	119, 120	9' - 0"
BASE	3.123	MECH. STORAGE	109 SF	Floor Finish - CONC.	119	9' - 0"
UNIT 4						
BASE	4.101	SLQ 1	155 SF	Floor Finish - CPT	102, 103, 107	9' - 0"
BASE	4.102	SLQ 2	155 SF	Floor Finish - CPT	101, 104, 107	9' - 0"
BASE	4.103	BATHROOM 1	86 SF	Floor Finish - CT	101, 105, 107	9' - 0"
BASE	4.104	BATHROOM 2	89 SF	Floor Finish - CT	102, 106, 107	9' - 0"
BASE	4.105	SLQ 3	149 SF	Floor Finish - CPT	103, 107, 111	9' - 0"
BASE	4.106	SLQ 4	149 SF	Floor Finish - CPT	104, 107-109	9' - 0"
BASE	4.107	CORRIDOR 1	129 SF	Floor Finish - LVT	101-106, 111	9' - 0"
BASE	4.108	HW CLOSET	18 SF	Floor Finish - CONC.	105, 109, 110	9' - 0"

Delaware Army National Guard
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BASE	4.109	LAUNDRY CLOSET	27 SF	Washer, Dryer, Floor Finish - VCT	105, 108, 110	9' - 0"
BASE	4.11	KITCHEN	244 SF	Floor Finish - LVT	108, 109, 111, 114	9' - 0"
BASE	4.111	LIVING ROOM	255 SF	Floor Finish - LVT	105, 110, 112, 113	9' - 0"
BASE	4.112	HVAC CLOSET	17 SF	Floor Finish - CONC.	113, 111, 115	9' - 0"
BASE	4.113	STORAGE CLOSET	19 SF	Floor Finish - VCT	111, 112, 115	9' - 0"
BASE	4.114	CORRIDOR 2	139 SF	Floor Finish - LVT	115-120, 110	9' - 0"
BASE	4.115	SLQ 5	151 SF	Floor Finish - CPT	112-114, 117	9' - 0"
BASE	4.116	SLQ 6	151 SF	Floor Finish - CPT	110, 114, 118	9' - 0"
BASE	4.117	BATHROOM 3	96 SF	Floor Finish - CT	114, 115, 119	9' - 0"
BASE	4.118	BATHROOM 4	96 SF	Floor Finish - CT	114, 116, 120	9' - 0"
BASE	4.119	SLQ 7	164 SF	Floor Finish - CPT	114, 117, 120	9' - 0"
BASE	4.12	SLQ 8	165 SF	Floor Finish - CPT	114, 118, 119	9' - 0"
UNIT 5						
BASE	5.101	SLQ 1	155 SF	Floor Finish - CPT	102, 103, 107	9' - 0"
BASE	5.102	SLQ 2	155 SF	Floor Finish - CPT	101, 104, 107	9' - 0"
BASE	5.103	BATHROOM 1	86 SF	Floor Finish - CT	101, 105, 107	9' - 0"
BASE	5.104	BATHROOM 2	89 SF	Floor Finish - CT	102, 106, 107	9' - 0"
BASE	5.105	SLQ 3	149 SF	Floor Finish - CPT	103, 107, 111	9' - 0"
BASE	5.106	SLQ 4	149 SF	Floor Finish - CPT	104, 107-109	9' - 0"
BASE	5.107	Room	129 SF	Floor Finish - LVT	101-106, 111	9' - 0"
BASE	5.108	HW CLOSET	18 SF	Floor Finish - CONC.	105, 109, 110	9' - 0"
BASE	5.109	LAUNDRY CLOSET	27 SF	Washer, Dryer, Floor Finish - VCT	105, 108, 110	9' - 0"
BASE	5.11	KITCHEN	244 SF	Floor Finish - LVT	108, 109, 111, 114	9' - 0"
BASE	5.111	LIVING ROOM	255 SF	Floor Finish - LVT	105, 110, 112, 113	9' - 0"
BASE	5.112	HVAC CLOSET	17 SF	Floor Finish - CONC.	113, 111, 115	9' - 0"
BASE	5.113	STORAGE CLOSET	19 SF	Floor Finish - VCT	111, 112, 115	9' - 0"
BASE	5.114	CORRIDOR 2	139 SF	Floor Finish - LVT	115-120, 110	9' - 0"
BASE	5.115	SLQ 5	151 SF	Floor Finish - CPT	112-114, 117	9' - 0"
BASE	5.116	SLQ 6	151 SF	Floor Finish - CPT	110, 114, 118	9' - 0"
BASE	5.117	BATHROOM 3	96 SF	Floor Finish - CT	114, 115, 119	9' - 0"
BASE	5.118	BATHROOM 4	96 SF	Floor Finish - CT	114, 116, 120	9' - 0"
BASE	5.119	SLQ 7	164 SF	Floor Finish - CPT	114, 117, 120	9' - 0"
BASE	5.12	SLQ 8	165 SF	Floor Finish - CPT	114, 118, 119	9' - 0"
UNIT 6						
ALT. 1	6.101	SLQ 1	155 SF	Floor Finish - CPT	102, 103, 107	9' - 0"
ALT. 1	6.102	SLQ 2	155 SF	Floor Finish - CPT	101, 104, 107	9' - 0"
ALT. 1	6.103	BATHROOM 1	86 SF	Floor Finish - CT	101, 105, 107	9' - 0"
ALT. 1	6.104	BATHROOM 2	89 SF	Floor Finish - CT	102, 106, 107	9' - 0"
ALT. 1	6.105	SLQ 3	149 SF	Floor Finish - CPT	103, 107, 111	9' - 0"
ALT. 1	6.106	SLQ 4	149 SF	Floor Finish - CPT	104, 107-109	9' - 0"

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ALT. 1	6.107	Room	129 SF	Floor Finish - LVT	101-106, 111	9' - 0"
ALT. 1	6.108	HW CLOSET	18 SF	Floor Finish - CONC.	105, 109, 110	9' - 0"
ALT. 1	6.109	LAUNDRY CLOSET	27 SF	Washer, Dryer, Floor Finish - VCT	105, 108, 110	9' - 0"
ALT. 1	6.11	KITCHEN	244 SF	Floor Finish - LVT	108, 109, 111, 114	9' - 0"
ALT. 1	6.111	LIVING ROOM	255 SF	Floor Finish - LVT	105, 110, 112, 113	9' - 0"
ALT. 1	6.112	HVAC CLOSET	17 SF	Floor Finish - CONC.	113, 111, 115	9' - 0"
ALT. 1	6.113	STORAGE CLOSET	19 SF	Floor Finish - VCT	111, 112, 115	9' - 0"
ALT. 1	6.114	CORRIDOR 2	139 SF	Floor Finish - LVT	115-120, 110	9' - 0"
ALT. 1	6.115	SLQ 5	151 SF	Floor Finish - CPT	112-114, 117	9' - 0"
ALT. 1	6.116	SLQ 6	151 SF	Floor Finish - CPT	110, 114, 118	9' - 0"
ALT. 1	6.117	BATHROOM 3	96 SF	Floor Finish - CT	114, 115, 119	9' - 0"
ALT. 1	6.118	BATHROOM 4	96 SF	Floor Finish - CT	114, 116, 120	9' - 0"
ALT. 1	6.119	SLQ 7	164 SF	Floor Finish - CPT	114, 117, 120	9' - 0"
ALT. 1	6.12	SLQ 8	165 SF	Floor Finish - CPT	114, 118, 119	9' - 0"

ARCHITECTURAL PROGRAM - VILLAGE CONCEPT:

Note: There are 5 “Standard Units”/Buildings (each with 8 SLQ Rooms), and 1 HC (Accessible) Unit. The HC Unit program has the same spaces as the Standard Units, plus it has three additional services spaces that are common for all 6 units (IT/Data Room, Mech. & Facilities Storage). The program table below shows the spaces for 1 Standard Unit and for the HC Unit.

1.10 OPTIONS / ALTERNATES AND BETTERMENTS.

1.10.1 **Options/Alternates.** The Government has identified Option Items that they wish included in the project based on available funds or funding limitations. The Option Items are identified in the RFP, listed individually on the Bidding Schedule, and described briefly below.

1.10.1.1 Option/Alternate ‘1’ – Exterior Wall Structure: Base Bid – Conventional Steel Post and Beam frame system, Option ‘1’ – Provide 6” Cold formed structural bearing metal studs.

1.10.1.2 Option/Alternate ‘2’ –: “Bare Bones Architectural”

2. 1. Exterior Wall upper section Siding: Base Bid - 26 GA steel concealed fastener system horizontal box rib panels, Option ‘.2.1’ - (26 GA steel exposed fastener “V” Rib panels
- 2.2. Exterior Wall finish: Base Bid Decorative CMU & Metal Siding, Option ‘2.2’ : Base Bid (see Base Bid 2.1 above), Option ‘2.2’- Decorative CMU 3’ above grade. Balance of wall EFIS
- 2.3 Roofing: Base Bid – 24 GA Standing seam (see elevations), Option ‘3’ – Architectural 3 tab asphalt shingles.
- 2.4 Windows: Base Bid – (2) 4’x4’ Sliders (thermally broken aluminum), Option ‘2.4’ – (1) 4’x4’ Slider (thermally broken aluminum).
- 2.5 Interior Flooring: Base Bid- LVT in bed/living room, ceramic tile in bathroom. Option ‘2.5’ – All flooring goes to standard VCT.

2.6 Ceilings: Base Bid – 5/8" GWB. Option '2.6' – All ceilings are ACT.
Water resistant in bathroom.

1.10.1.3 Option/Alternate '3' – Roofing: Base Bid – 24 GA Standing seam (see elevations), Option '3' – Architectural 3 tab asphalt shingles.

1.10.1.4 Option/Alternate '4' – SLQ Bathroom Tub/Shower:
Base Bid–Fiberglass Tub/Shower with curtain rod & shower curtain and tile walls.
Alternate 'G.1' – Provide fiberglass tub/shower unit with integral walls and soap shelves.
Alternate 'G.2' - Provide fiberglass shower unit with tile walls.
Alternate 'G.3' – Provide fiberglass shower unit with integral walls and soap shelves.

1.10.1.5 Option/Alternate '5' – Foundations
Base Bid – Deep Foundation: Concrete Grade Beams with Auger Cast Concrete Pyles.
Option '5' – Concrete Spread footings.

1.10.1.6 Option/Alternate '6' – HVAC System:
Base Bid – VRF system with (2) multi zone/space condensing units.
Alternate '6' – Thru wall heat pump PTAC units in each SLQ and for each Laundry/Vending space.

1.10.2 **Betterments.** Betterments are features, materials or systems that exceed the requirements of this RFP. The Contractor is encouraged to provide betterments to the design, while staying within the Project cost limitations. Such betterments may be Contractor suggested. The offeror shall provide sufficient information on proposed betterments for the Government to determine quality and quantity.

1.11 **USER BACKGROUND INFORMATION.** Transient Training Officers Barracks is a National Guard facility that supports training, administrative, and logistical requirements for the DEARNG.

1.11.1 There will be approximately 24 people lodging in the building on a part-time basis Sunday through Saturday, and the largest drill weekend will have approximately 24 personnel using the facility. It is anticipated that the facility will be used one or two weeks per month for National Guard training activities.

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90.1 Energy Standard for Buildings – Except Low Rise Residential Buildings shall be the applicable reference. The requirements of ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality shall be used in lieu of the ventilation requirement contained in the IMC.

2.1.6 The primary criteria and guidance for detailed design of this Army National Guard facility are the following: the Department of Army Facilities Standardization Program “Transient Training Officer’s Quarters,” Army National Guard DG 415-5, General facilities Design Guide and. The Contractor shall follow the guidance of the DG in developing the project design, unless this RFP directs otherwise. For the purposes of this RFP, when the word “should” is used in the DG, it indicates a mandatory requirement for this project. When the DG references Government criteria documents not referenced in this RFP, those criteria do not apply to this project.

2.1.7 Accessibility – Design and construction must comply with ADA-ABA Accessibility Standard for Department of Defense Facilities and UFAS, whichever is most stringent. The project will also be required to comply with the State of Delaware Architectural Accessibility Board requirements. Buildings shall be considered to be “commercial facilities” under ADA-ABA.

2.1.8 Design and construction shall comply with applicable Federal laws and regulations, such as EPA Clean Water and Clean Air Act and OSHA requirements.

2.2 **LOCAL AND STATE CODES OR STANDARDS.** The following specifications, codes, standards, bulletins and handbooks form a part of this RFP.

2.2.1 **State and Local**

Preliminary Land Use Service (PLUS) Comments and Responses – Contractor shall refer to DEARNG responses to PLUS comments for specific requirements and applicability
State of Delaware Department of Transportation (DeIDOT) – Contractor shall obtain a Letter of No Objection and DeIDOT Commercial Entrance Approval as required
Water and Sewer Approvals from Sussex County
Sussex County – Site Plan / Planning and Zoning / Record Plan Approval as required by the County
Delaware Department of Natural Resources and Environmental Control (DNREC) - Notice of Intent (NOI)
DNREC – State of Delaware Stormwater Regulations
DNREC – Sediment and Stormwater Approval
DNREC Certified Construction Reviewer (CCR)
Delaware State Fire Marshal – NFPA 101 2021
State Office of Drinking Water – Water system extension
DNREC Surface Water Discharges – Sewer system extension
State of Delaware Architectural Accessibility Board
State of Delaware Division of Facilities Management – Facility and Site Plan Approval

2.2.2 **National.**

IBC – International Building Code 2018
IPC – International Plumbing Code 2018
IMC – International Mechanical Code 2018

2.3 **MILITARY CRITERIA.** The following publications form a part of this document.

I3A	Technical Guide for Installation Information Infrastructure Architecture (I3A), for outside plant design criteria
TI 800-01	Design Criteria (for computation of building areas) Unified Facilities Criteria
Series 1-200: UFC 1-200-01 UFC-1-200-02	Policy Design: General Building Requirements High Performance and Sustainable Building Requirements
Series 1-300: UFC-1-300-08	Procedures and Guidance Criteria for Transfer and Acceptance of DoD Real Property
Series 3-100: UFC 3-101-01 UFC 3-110-03 UFC 3-120-01 UFC 3-120-10 UFC 3-190-06	Architecture and Interior Design Architecture Roofing Design: Sign Standards Interior Design Protective Coating and Paints
Series 3-200: UFC 3-201-01 UFC 3-201-02 UFC 3-210-10 UFC 3-220-01 UFC 3-240-01 UFC 3-250-03 UFC 3-250-04 UFC 3-250-07	Civil/Geotechnical/Landscape Architecture Civil Engineering Landscape Architecture Low Impact Development Geotechnical Engineering Wastewater Collection Standard Practice Manual for Flexible Pavements Standard Practice for Concrete Pavement Standard Practice for Pavement Recycling
Series 3-300: UFC 3-301-01	Structural and Seismic Design Structural Engineering
Series 3-400: UFC 3-400-02 UFC 3-401-01 UFC 3-410-01 UFC 3-410-01	Mechanical Design: Engineering Weather Data Mechanical Engineering Heating, Ventilating, and Air Conditioning System BacNet Direct Digital Control for HVAC and Other Local Building Systems, with Change 1.

UFC 3-420-01	Plumbing Systems
Series 3-500:	Electrical
UFC 3-501-01	Electrical Engineering
UFC 3-520-01	Interior Electrical Systems
UFC 3-530-01	Interior and Exterior Lighting Systems and Controls
UFC 3-550-01	Exterior Electrical Power Distribution
UFC 3-575-01	Lighting and Static Electricity Protection System
UFC 3-580-01	Telecommunications Building Cabling Systems Planning and Design
Series 3-600:	Fire Protection
UFC 3-600-01	Fire Protection Engineering for Facilities
Series 4-000:	Multi-Disciplinary and Facility-Specific Design
UFC 4-010-01	DoD Minimum Antiterrorism Standards for Buildings
UFC 4-020-01	DOD Security Engineering Facilities Planning Manual
UFC 4-021-01	Design and O&M: Mass Notification Systems
UFC 4-021-02	Electronic Security Systems
UFC 4-022-03	Security Fences and Gates
DG 415- 2	Army National Guard Design General Facilities Design Guide
DG 415- 4	Army National Guard Training Site Facilities Design Guide
DG 415- 5	Army National Guard General Facilities Guide
DG 415- 5	Army National Guard Program Development & Execution
DG 415-12	Army National Guard Facilities Allowances
No number	Army Facilities Standardization Program “Transient Training Officer’s Quarters,”
No number	ADA-ABA Accessibility Standard for Department of Defense Facilities

2.4 **OTHER APPLICABLE CRITERIA.** Applicable design and construction criteria references are listed below. This list is not intended to include all criteria that may apply or to restrict design and construction to only those references listed. The most recent issue of the standards are to be applied unless a specific issue is presented hereinafter.

- Air Conditioning and Refrigeration Institute (ARI)
 - ARI 310/380 Packaged Terminal Air-Conditioners and Heat Pumps
 - ARI 440 Room Fan-Coil and Unit Ventilator
 - ARI 445 Room Air-Induction Units
 - ARI 880 Air Terminals
- Air Movement and Control Association (AMCA)
 - AMCA 210 Laboratory Methods of Testing Fans for Rating

- American Architectural Manufacturers Association (AAMA)
 - AAMA 605 Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
 - AAMA 607.1 Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum
 - AAMA 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections
 - AAMA/WDMA 101/I.S.2/NAFS North American Standard /Specification for windows, doors and skylights.

- American Association of State Highway and Transportation Officials (AASHTO)
 - Roadside Design Guide [guardrails, roadside safety devices]
 - Standard Specifications for Transportation Materials and Methods of Sampling and Testing [Road Construction Materials]
 - Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals
 - A Policy of Geometric Design of Highways and Streets
 - Guide for Design of Pavement Structures, Volumes 1 and 2 [pavement design guide]

- American Bearing Manufacturers Association (AFBMA)
 - AFBMA Std. 9 Load Ratings and Fatigue Life for Ball Bearings
 - AFBMA Std. 11 Load Ratings and Fatigue Life for Roller Bearings

- American Boiler Manufacturers Association (ABMA)
 - ABMA ISEI Industry Standards and Engineering Information

- American Concrete Institute
 - ACI 318, Building Code Requirements for Structural Concrete
 - ACI 315, Details and Detailing of Concrete Reinforcement
 - ACI 530, Building Code Requirements for Masonry Structures

- American Concrete Pipe Association
 - Design Manual
 - Installation Manual

- American Institute of Steel Construction (AISC)
 - Steel Construction Manual
 - Seismic Design Manual
 - Steel Design Guide 11, Floor Vibrations due to Human Activity

- American Iron and Steel Institute, North American Specification for the Design of Cold-Formed Steel Structural Members AISI/COS NASPEC 2013

- American National Standards Institute 11 (ANSI)
 - ANSI Z21.10.3-2015/CSA 4.3-2015 Gas-Fired Water Heaters, Volume III, Storage Water Heaters with Input Ratings Above 75,000 Btu Per Hour, Circulating And Instantaneous
 - ANSI Z21.10.1 Gas Water Heaters Vol. 1, Storage water Heaters with Input Ratings of 75,000 Btu per Hour or less
 - ANSI Z21.45 Flexible Connectors of Other Than All-Metal Construction for Gas Appliances
 - ANSI C2 National Electrical Safety Code
 - ANSI/AF&PA NDS National Design Specification for Wood Construction

American Society of Civil Engineers (ASCE)
Minimum Design Loads for Buildings and Other Structures – ASCE 7
Design and Construction of Sanitary and Storm Sewers, Manuals and
Reports on Engineering Practice – No. 37 [sanitary sewer and storm
drain design criteria]

American Society of Heating, Refrigerating and Air Conditioning Engineers
(ASHRAE)
ASHRAE 90.1-2013 Energy Standard for Buildings Except Low-Rise
Residential Buildings
ASHRAE Advanced Energy Design Guide for Small Office Buildings
ASHRAE Guideline 1, The HVAC Commissioning Process
ASHRAE Hdbk-IP Handbook, Fundamentals I-P Edition
ASHRAE HVAC Applications Hdbk – Handbook, HVAC Applications
ASHRAE Standard 15
ASHRAE Standard 55-2013 Thermal Environmental Conditions for
Human Occupancy
ASHRAE Standard 62.1-2013 Ventilation for Acceptable Indoor Air
Quality
ASHRAE Standard 189.1-2014 Standard for the Design of High-
Performance Green Buildings Except Low-Rise Residential Buildings

American Society of Mechanical Engineers International (ASME)
ASME BPVC SEC VII Boiler and Pressure Vessel Code: Section VII
ASME A17.1 Safety Code for Elevators and Escalators

American Society for Testing and Materials (ASTM)
E1592 Standard Test Method for Structural Performance of Sheet Metal
Roof and Siding Systems by Uniform Static Air Pressure Difference

American Water Works Association (AWWA)
AWWA Standards [standards for water line materials and construction]

American Welding Society, Welding Handbook

Architectural Woodwork Institute (AWI)
AWI Quality Standards

Associated Air Balance Council (AABC)
AABC MN-1 National Standards for Testing and Balancing Heating,
Ventilating, and Air Conditioning Systems
AABC Commissioning Group Commissioning Guidelines

Builders Hardware Manufacturers Association (BHMA)
ANSI/BHMA A156.4 American National Standards for Door Controls –
Closers...

Building Industry Consulting Service International (BICSI)
Telecommunications Distribution Methods Manual (TDMM)

Concrete Construction – ACI/MCP 1, 2, 3 & 4 ASTM – A185/A185M -318, 530/530.1

Cast Iron Soil Pipe Institute (CISPI)

Cold-Formed Steel Design Manual, AISI 2013

Code of Federal Regulations (CFR)
49 CFR 192 Transportation of Natural and Other Gas by Pipeline:
Minimum Federal Safety Standards
10 CFR 430 Energy Conservation Program for Consumer Products

Ductile Iron Pipe Research Association (DIPRA), Design of Ductile Iron Pipe

Electronic Industries Association (EIA)

TIA/EIA 568-C Commercial Building Telecommunications Cabling Standards
TIA/EIA 569-B Commercial Building Standard for Telecommunications Pathways and Spaces
TIA/EIA-606-A Administration Standard for Commercial Telecommunications Infrastructure
ANSI-J-STD 607-A Commercial Building Grounding and Bonding Requirements for Telecommunications
Federal Highway Administration (FHWA)
Manual on Uniform Traffic Control Devices for Streets and Highways [signage for streets and highways]
FEMA 302 – NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, 2009 Edition (1 January, 2010)
Illuminating Engineering Society of North America (IESNA)
IESNA RP-1 Office Lighting
IESNA RP-8 Roadway Lighting
IESNA Lighting Handbook, Reference and Application
Institute of Electrical and Electronics Engineers Inc. (IEEE)
Standard for Use of the International System of Units (SI): the Modern Metric System
Institute of Traffic Engineers (ITE)
Trip Generation
Transportation Planning Handbook
LEED: Leadership in Energy and Environmental Design Green Building Rating System, Version 3, as developed by the U.S. Green Building Council (USGBC)
MBNA-01 Low Rise Building Systems Manual
National Association of Corrosion Engineers International (NACE)
NACE RP0169 Control of External Corrosion on Underground or Submerged Metallic Piping Systems
NACE RP0185 Extruded, Polyolefin Resin Coating Systems with Adhesives for Underground or Submerged Pipe
NACE RP0285 Corrosion Control of Underground Storage Tank Systems by Cathodic Protection
NACE RP0286 Electrical Isolation of Cathodically Protected Pipelines
National Electrical Manufacturers Association (NEMA)
National Electrical Safety Code C2
National Environmental Balancing Bureau (NEBB)
NEBB Procedural Standards Procedural Standards for Testing Adjusting Balancing of Environmental Systems
NEBB Procedural Standards for Building Systems Commissioning
National Fire Protection Association (NFPA)
NFPA 10 Standard for Portable Fire Extinguishers
NFPA 13 Installation of Sprinkler Systems
NFPA 13R Residential Occupancies up to and Including Four Stories in Height Sprinkler Systems
NFPA 20 Installation of Centrifugal Fire Pumps
NFPA 24 Standard for the Installation of Private Fire Service Mains and Their Appurtenances [underground fire protection system design]
NFPA 30 Flammable and Combustible Liquids Code

NFPA 30A Motor Fuel Dispensing Facilities and Repair Garages
NFPA 54 National Fuel Gas Code
NFPA 58 Liquefied Petroleum Gas Code
NFPA 70 National Electrical Code
NFPA 72 National Fire Alarm Code
NFPA 80 Standard for Fire Doors and Fire Windows
NFPA 90a Installation of Air Conditioning and Ventilating Systems
NFPA 101: Life Safety Code 2021
NFPA 780 Standard for the Installation of Lightning Protection Systems
National Food Code
 FDA Model Food Code
National Roofing Contractor's Association
 NRCA Roofing and Waterproofing Manual
Occupational Safety and Health Administration (OSHA)
 OSHA Construction Industry Standards, Title 29, Code of Federal
 Regulations, Part 1926, Safety and Health Regulations for
 Construction
Plumbing and Drainage Institute (PDI)
 PDI WH201 Water Hammer Arrestors
Precast Concrete Institute
 PCI Design Handbook – Precast and Prestressed Concrete
Sheet Metal and Air Conditioning Contractor's National Association
(SMACNA)
 SMACNA HVAC Duct Construction Standards HVAC Duct Construction
 Standards -
 Metal and Flexible
 SMACNA Architectural Manual Architectural Sheet Metal Manual
Specification for Structural Joints Using High Strength Bolts
Steel Door Institute (SDI), 111, A250.4.6 & 8
 ANSI A250.8/SDI 100 Standard Steel Doors and Frames
Steel Deck Institute, SDI Diaphragm Design Manual
Steel Joist Institute
Structural Welding Code – Steel, ANSI/AWS D1.1-2010
 Catalog of Standard Specifications and Load Tables for Steel Joists and
 Joist Girders
 SJI Tech Digest #5 Vibration of Steel-Joist Concrete Slab Floors
Underwriters Laboratories (UL)
 UL 96A Installation Requirements for Lightning Protection Systems
 UL 300 Standard for Safety for Fire Testing of Fire Extinguishing Systems
 for Protection of Restaurant Cooking Areas
Uni-Bell PVC Pipe Association, Handbook of PVC Pipe: Design and
 Construction
Recommended Standards for Wastewater Facilities, by Health Research, Inc.
 <http://www.hes.org>

2.5 SOURCES FOR GOVERNMENT PUBLICATIONS.

2.5.1 AR (Army Regulations) may be found at <http://www.apd.army.mil>

2.5.2 ADA-ABA is available at <http://www.access-board.gov/guidelines-and-standards/buildings-and-sites>

2.5.3 The Design Guides are available at www.wbdg.org

2.5.4 UFC's: <http://www.wbdg.org> (The most recent version to be applied)

2.6 PERMITS AND COORDINATION WITH LOCAL AUTHORITIES.

2.6.1 **General.** The Contractor is responsible for making all applications and obtaining required municipal, utility, and regulatory agency coordination, reviews, permits including but not limited a building permit from Sussex County, inspections and approvals, and is responsible for payment of any associated fees or charges. If Government information, signatures, names or addresses are required for applications, approvals or permits, the Contractor is responsible for obtaining same. Permit requirements which have been identified are listed below. This list is not all-inclusive, and Contractor is responsible for verifying that information below remains accurate.

2.6.2 **Jurisdiction.** The Contractor is required to comply with local codes and regulations, as noted in Section 2.1.3. The Contractor shall strive to keep local governmental agencies informed of the design and construction progress of the project.

2.6.3 **Streets, Rights of Way, and Street Access.** Point of contact is Delaware Department of Transportation.

2.6.4 **Planning and Zoning.** Point of contact is Sussex County.

2.6.5 **Building Code.** The Contractor is responsible for compliance with applicable building codes. The Government's review of Contractor's design and construction will include review for code compliance, but does not relieve Contractor of compliance responsibility.

2.6.6 **Fire Protection.** The Contractor is responsible for compliance with applicable fire protection and life safety codes. The Government's review of Contractor's design and construction will include review for compliance with requirements, but does not relieve Contractor of compliance responsibility. Point of contact is Delaware State Fire Marshal.

2.6.7 **Water.** See Part 3 of this Section for additional information.

2.6.8 **Sanitary Sewer.** See Part 3 of this Section for additional information.

2.6.9 **Electric.** See Part 4 of this Section for additional information.

2.6.10 **Telephone.** See Part 4 of this Section for additional information.

2.6.11 **Cable Television.** See Part 4 of this Section for additional information.

2.6.12 **Storm Drainage, and Soil and Water Conservation.** See Part 3 of this Section for additional information.

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PART 3

SITE CIVIL ENGINEERING

3.1 GRADING.

3.1.1 Particulars of grading will vary by project. The three principal project areas are: MC, VC, and Demo (Demolition).

MC: The difference in grade between the finished floor elevation FFE and the surface of the ground immediately adjacent to the building shall be a minimum of 6 inches in 10 feet, except at personnel and overhead doors, sidewalks to the building or along accessible routes.

VC: Existing grades in the vicinity of the project area are approximately four feet below the 100-year floodplain elevation. Accordingly, the proposed finished floor elevation of the structures are proposed to be set one (1) foot higher than the 100-year floodplain elevation of 6. Access to the structure from parking and sidewalks will be by stairs and an elevated wood deck and by ADA-compliant ramping as shown.

MC/VC: Proposed grades shall be appropriate for the intended use. For example, parking shall be less than 4%. ADA-compliant spaces and landing areas shall comply with the provisions of the ADA. Grasses areas shall be graded to drain. Lawn and landscaped areas shall be graded to facilitate maintenance. Maximum slopes shall not exceed 2:1 in accordance with State Law. For areas where grades exceed 2:1, walls shall be used. The Contractor's geotechnical engineer shall identify if steeper grades are necessary based on shrink/swell soil characteristics.

Demolition: For the purposes of demolition, specific grading for the transportation of soil and fill placement have been established for the fitness area.

3.1.2 Design grades to provide required sight lines related to traffic and roadway design.

3.1.3 Design grades to meet accessibility requirements where required.

3.1.4 MC/VC: The Contractor shall be responsible for dewatering necessary for grading and other subsurface works for the construction of the Project. The Contractor is responsible for securing all the required information necessary for the design of the system. If temporary construction dewatering is required due to a high-water table the Contractor shall prepare and present a dewatering plan and apply to DNREC Water Supply Branch for the appropriate dewatering permit. Be advised, permits above certain daily pumping volumes require public notice.

3.1.5 MC/Demo: A balance of the quantity of cut and fill soils which would create a smooth transition of graded areas into the existing natural site is desired. Site specific conditions such as flood and drainage protection, slopes and access reasons may cause unbalanced earthwork operations and are to be identified by the Contractor in the first Site/Utility Design submittal. The project is expected to create excess soils unsuitable

for fill and require structural imported fill. All soil fill removed from the site shall be placed in an approved off-site location in accordance with DNREC requirements.

VC: The project is not expected to create significant excess soil and resulting materials can be incorporated into the LOD and area surrounding the project site.

MC/VC: All soil, debris or other materials removed from the site shall be placed in an approved off-site location in accordance with DNREC requirements.

Demo: soil suitable for transport and filling / compaction can be incorporated into the for the athletic area as shown on the plans.

3.1.6 The plan shall reflect selective site clearing that preserves groups of trees, if required. Extensive site clearing beyond the active construction footprint is not anticipated at this time. Some clearing may be required to place the necessary security fence at the post property line.

3.1.7 Erosion and Sediment Control Facilities shall comply with Federal, State and local regulations.

MC: Infiltrative practices are preferred. Site sediment and stormwater design will be reviewed and approved by DNREC. The project may or may not require a Certified Construction Reviewer (CCR). The Contractor is responsible for compliance with stormwater NPDES Permit, Stormwater Pollution Prevention Plan, and NOI/NOT requirements, and for any associated fees and permits. See Section 01 57 20.00 10 and 01 57 23. Wet ponds shall be in accord with Pond Code 378 as amended for Delaware.

VC: It is intended that this project qualify as a Standard Plan with DNREC. Extensive stormwater management practices should not be necessary for this project.

Demo: the bulk earthwork and demolition activities are sequenced so as to limit the acreage of disturbance.

3.1.8 The Contractor shall obtain and pay fees required for all permits.

3.1.9 The Contractor shall notify utilities and obtain marked utility locations prior to start of construction. Underground utilities have been located to the extent practicable and this information is provided on the site plans. However, this information may not be complete or all-encompassing. "One Call" utility location programs are to be used where available, however the use of private utility locating services may be necessary. The Contractor has the sole responsibility to locate, identify and coordinate utility work. All existing utility services are to remain in-service unless a service outage is needed to conduct work. The planned service outage must be coordinated with the designer and Owner to minimize anticipated downtime.

3.2 GEOTECHNICAL STUDIES

3.2.1 **Subsurface Characterization Report.** It is possible that site specific subsurface conditions encountered by the Contractor will differ from those appended

herein. Therefore, it is the responsibility of the Contractor to establish a meeting with the Contracting Officer subsequent to completion and evaluation of his site specific geotechnical exploration to outline any differences encountered that are not consistent with the information provided herein. Should those differences require changes in the foundation type, pavement and earthwork requirements proposed with the bid that result in more cost, these differences shall be clearly outlined for the meeting.

3.2.2 Contractor's Geotechnical Report: A final geotechnical evaluation report shall be prepared by the Contractor's licensed professional geotechnical engineer and submitted along with the first foundation design submittal.

3.2.3 Soil Compaction and Foundation Excavations.

3.2.3.1 Basic soil compaction requirements are to be given in the Contractor's Geotechnical Report. The Outline Technical Specifications requirements shall be verified or modifications recommended by the Contractor's geotechnical engineer in the report whenever engineering, soils or climatic factors indicate the necessity. Any modifications to the stated compaction requirements shall require approval from the Contracting Officer.

3.2.3.2 Subgrade suitability (by proof rolling operations), fill placement and compaction operations shall be observed and tested on a full time basis by a qualified independent testing agency as directed by the Contractor's licensed professional geotechnical engineer. Field in-place density shall be determined and checked in accordance with the appropriate ASTM methodologies. The rate of in-place density testing shall be specified in the earthwork specifications. Representative Optimum Moisture and Laboratory Maximum Density Tests shall be made for each type of material or source of material. Upon completion of all earthwork, the Contractor's geotechnical engineer shall certify in writing that the fill was placed in accordance with the requirements and provide the backup data including but not limited to: Proctor curves (moisture/density relationship), moisture contents, Atterberg limits, field density checks, sieve analysis, etc. Testing locations and elevations for all results shall be documented so that their position can be substantiated and relocated if necessary.

3.2.3.3 During construction, foundation excavations shall be inspected and approved by the Contractor's licensed professional geotechnical engineer prior to placing concrete.

3.2.4 Capillary Water Barrier. A capillary water barrier is required for all interior slabs on grade, including garages, carports and storage rooms.

3.3 UTILITIES. All projects: See Part 2 and site drawings for additional utility information. All underground lines not remaining in service shall be disconnected at the source and removed in their entirety. If complete removal is not determined to be feasible or disturbs areas outside the project boundary, then it will be acceptable to remove from both the source end and the user connection at least five (5) feet from the connection point or proposed building envelope, whichever is greater. Furthermore, utilities remaining in-place shall not conflict with proposed uses, new utility service and/or project needs. Conflicts of this nature shall be remedied by either relocating

utilities required to remain in service or by removing them to eliminate the conflict. Utilities remaining in-place shall not conflict with proposed uses, new utility service, and/or project needs. All coordination necessary for utility construction, abandonment or relocation with the individual utility providers shall be by the Contractor. Existing utilities to remain shall be protected from any and all damage or interruption of service. In addition, utilities or utility components designated to remain shall be modified or relocated as necessary to protect their function and serviceability and there shall be no interruption of level of service or protection. This includes, but is not limited to existing fire hydrants, valves, sewer manholes, overhead and underground utilities and monitoring wells.

Utilities may need to be relocated to facilitate installation of all project components. This is to be verified by the Contractor.

3.3.1 Gas Distribution System. Natural Gas service is not available at the site and the Site relies on tanked propane. Contractor shall coordinate with the utility provider to determine location, supply and connection needs. Extension or expansion of the existing gas distribution systems at the site shall be in accordance with the service provider, NFPA 54 and State requirements. Gas service work accomplished by the contractor shall utilize specialty subcontractors with the approval of the utility provider. New service tanks may be necessary.

3.3.1.1 Materials. Piping, valves, regulators and vaults shall be that required or utilized by NFPA 54 and State agencies. Contractor to coordinate with the gas provider and State agencies for this information.

3.3.1.2 Testing. Prove that the entire system of gas mains and service lines is gas-tight by an air test, in accordance with ANSI B31.8. The test shall continue for at least 24 hours between initial and final readings of pressure and temperature. Contractor to ensure that this test is performed.

3.3.1.3 Mains and Service Lines. Lines shall not be placed under any buildings. Lines shall be placed with a minimum of 36 inches of earth cover or as directed by the state Fire Marshal, service provider or UFC requirements, whichever is more restrictive shall govern. Protective casings shall be provided to protect lines from superimposed street or heavy traffic loads.

3.3.1.4 Not Used

3.3.2 Water Distribution System. The design of the water distribution system shall be in accordance with the requirements as noted herein and in the American Water Works Association (AWWA) Standards and Manuals of Water Supply Practices. Also, conform to State and Municipal water supply standards including the Delaware State Office of Drinking Water and Artesian Water Company. Looped systems are preferred and may be required by the State Fire Marshal and the UFC. Where standards disagree, the most stringent shall apply. The system shall be installed in accordance with the Purveyor Standards and requirements. The Contractor shall determine the domestic and the fire demands for the facilities and shall verify the design of all components of the domestic and fire protection supply systems. Design of a water

distribution system requires both domestic and fire flow demands be considered concurrently. No building shall be placed over existing water pipes. Specific water system design and installation requirements shall be in accordance with Sussex Shores and State of Delaware Office of Drinking Water requirements.

3.3.2.1 Analysis of Existing System Capacity. Existing flow characteristics shown in Attachment B are for information only. The Contractor shall perform, or have performed by a qualified fire protection designer, a flow test to verify the results noted in this RFP. See Part 13 of this RFP for detailed fire protection requirements.

3.3.2.2 Connections to Water Mains and Building Service Lines. Connection to the existing water mains shall be where shown on drawings. Looped system will be required and separate meters will be required for all new building connections pursuant to the UFC and Sussex Shores requirements.

3.3.2.3 Connections to Water Mains. Design the connections to the water distribution system including the meter assemblies and the necessary backflow-preventing devices. Fire protection system shall be considered as that part of the distribution system supplying fire hydrants, or fire hydrant laterals. Mains that are incorporated into a larger distribution system shall be looped with no dead ends and be of adequate size to satisfy both domestic and fire flow requirements. Minimum main size is 6 inches. Sufficient sectional control valves shall be provided so that no more than two fire hydrants will be out of service in the event of a single break in a water main. The pipe, valves, and all other materials shall meet the requirements of a 150 psi working pressure system or as required by the utility service provider.

3.3.2.4 Building Connections. Contractor shall provide the necessary transition fittings, adaptors, or reducers need between site piping and building piping.

3.3.2.5 Trenches. Water and gas mains shall not to be installed in the same trench. Water mains shall have a minimum earth cover as required by the water distribution utility and State agencies. Where frost penetrates to a depth greater than the minimum above, greater cover will be required. Sufficient cover must also be provided to protect the pipe against structural damage due to superimposed surface loads. Lines installed with less cover than the minimums stated shall be concrete encased with a minimum concrete thickness of 6 inches and insulated to prevent freezing. [Lines crossing below railroad tracks shall be a minimum of 48 inches below grade and shall be sleeved or cased in accordance with the requirements of the applicable criteria in part 2].

3.3.2.6 Fire Hydrants. Hydrants and valves shall conform to AWWA C500. All materials and installation shall be per the State of Delaware Fire Code. Post Indicator valves shall conform to the requirements of NFPA 24. Fire hydrants shall be compatible with those presently in use in the area, with similar pump and hose connections. Hydrants shall be dry barrel type. The maximum amount of flow that can be permitted shall be determined. Fire hydrant spacing shall be no greater than 500 feet apart by paved road. In addition, a hydrant shall be provided so that all parts of the facilities can be reached by hose lines not over 300 feet long. All distances shall be calculated along the closest route that the fire apparatus must travel (i.e., along the curb or access lane). Each hydrant may account for a maximum of 1500 gpm of fire protection regardless of existing pressures or water line capacity. A fire hydrant shall be located within 150 feet

from any fire department connection provided. Hydrant laterals shall be 6 inches minimum size, and shall not exceed 50 feet in length where possible, and shall have an underground shutoff valve. Valve box, at each lateral, shall be located within 10 feet of the hydrant, and shall not be located where obstructed by parked vehicles, shrubbery, etc. Bollards shall be provided where hydrant locations are subject to vehicle damage.

3.3.2.7 Shutoff Valve. Each building shall be provided with a separate service and main shutoff valve, readily accessible to maintenance and emergency personnel. Shutoff valves in walks are prohibited. Valves shall have valve boxes or manholes extending to the surface with the word "water" cast in the lid pattern.

3.3.2.8 Metering. All utilities (including geothermal system) shall have meters provided, meters shall be capable of electronic pulsed output that can be tied into the DEARNG energy management system as well as satisfy utility provider requirements.

3.3.2.9 Materials. Materials for the water distribution system shall be in accordance with the attached water distribution specification in the Outline Technical Specifications. For ductile iron piping systems (except for ductile iron piping under floor in soil) conduct an analysis to determine if cathodic protection and/or bonded or unbonded coatings are required.

3.3.2.10 Field Quality Control for Water Distribution. The Contracting Officer will witness field inspections and field tests specified. The Contractor shall perform field tests. Water needed for field tests will be furnished by the Contractor. Water needed for field tests and its disposal shall be furnished by the Contractor. Do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete. The Contractor shall coordinate with water purveyor for utility inspection and pay associated fees.

3.3.2.11 Existing Monitoring Wells. Existing wells to remain in service for monitoring purposes shall be protected. Existing wells to be abandoned shall follow DNREC requirements. If wells to remain conflict with site construction and cannot be protected, DNREC may require replacement wells located elsewhere. Refer to drawings for well locations. The Contractor is responsible for final disposition of wells.

3.3.3 **Sanitary Sewer System.** The Contractor shall determine the sewage contribution for the facilities and shall verify the design of all components of the sanitary sewer system. The Contractor shall use sewage flow determination methods of the American Society of Civil Engineers, Water Pollution Control Federation method or methods required by the local waste water collection and treatment authority. No buildings shall be placed over existing sanitary sewer mains. All sewer connections, mains, laterals and service design and construction shall be in accordance with Sussex County Public Works and DNREC Surface Water Discharges Section requirements. Adequacy of the existing on site-sewer transmission capacity, including pump station capacity, shall be evaluated by the Contractor from the new facility to the tie-in point to Sussex County sewer connection on Route 1. Deficient sections for transmission shall be remedied by the Contractor including but not limited to upsizing required forcemains or modifications to the on-site pumping system.

- 3.3.3.1 Analysis of Existing System Capacity. The Contractor shall provide design calculations or conforming documentation from the wastewater utility that shows the existing system is capable of conveying and treating the additional flows from this facility.
- 3.3.3.2 Connections to Sewage Collection Mains and Building Service Lines. The Contractor shall connect to the existing sewer system as shown on the plans.
- 3.3.3.3 Building Sewer Laterals and Connections. Laterals and building connections shall be designed and constructed in accordance with State agency and wastewater utility standards. Minimum diameter for laterals shall be 6 inches while maintaining a minimum velocity of 2 feet per second or per Sussex County Public Works requirements.
- 3.3.3.4 Collection Trunks and Laterals. Pipe sizes and slopes shall be calculated using Manning's Formula. Manholes are required at all changes of direction and spaced not more than 300 feet apart. Curved sewers are prohibited except where approved by the municipal sewers utility for large diameter trunks or interceptors. Pipes shall be designed to flow full and maintain a minimum velocity of 2 fps. Minimum size 8 inches.
- 3.3.3.5 Trenches. Sewer and water lines, mains or laterals, shall be placed in separate trenches.
- 3.3.3.6 Minimum Sewer and Water Distribution Pipe Separation Requirements. Parallel water and sewer pipe and crossings between water and sewer pipe shall conform to Paragraph 38.3 of the Recommended Standards for Wastewater Facilities, published by Health Research, Inc. and the Ten States Standard.
- 3.3.3.7 Cover. Sewer lines shall be located at a depth greater than the frost penetration. Coordinate with building connection requirements. To prevent the pipe from being crushed by construction vehicles and the design vehicle, the minimum cover above the top of pipes shall be 30 inches unless pipe sleeve materials are used and/or unless the pipe is concrete encased with a minimum of 6-inch thickness of concrete.
- 3.3.3.8 Sewage Pump Station and Force Main. New Pump stations and force mains shall only be used when absolutely necessary. If required or specified, pump stations and force mains shall conform to Paragraph 40 of the Recommended Standards for Wastewater Facilities, published by Health Research, Inc. and Sussex County and DNREC Requirements.
- 3.3.3.9 Field Quality Control for Sanitary Sewer Distribution System. The Contracting Officer will witness field inspections and field tests specified. The Contractor shall perform field tests. Water needed for field tests and its disposal shall be furnished by the Contractor. For force mains, do not begin testing on any section of a pipeline where concrete thrust blocks have been provided until at least 5 days after placing of the concrete. The Contractor shall coordinate with the sewer utility for utility inspections and pay associated fees.
- 3.3.3.10 Manholes. Manholes shall be located at intersections and changes in alignment or grade for gravity systems. Intermediate manhole maximum spacing shall be 300 feet. Manholes and manhole appurtenances shall be precast concrete. Shape

manhole inverts to the shape of the pipe with cast-in-place concrete after installing pipes. The manhole lid and surface castings per Sussex County Public Works requirements.

3.3.4 Storm Drainage Collection Systems and Grading.

3.3.4.1 Location of Connections to Existing Systems. It is intended that this project will not need to connect to a structural storm management system. If necessary, however, the Contractor shall connect to the existing storm sewer system or drainage conveyance or replace as shown on the plans. Connect to storm sewer drainage conveyance with a manhole or appropriate drainage control structure.

3.3.4.2 Building Connections. If used, connections to building roof or area drain lines shall be designed and constructed in accordance with the International Building Code 2000 or latest edition.

3.3.4.3 Storm Sewer System. The storm sewer system shall be designed for a minimum of a 10-year return frequency or as required pursuant to DNREC and DeIDOT standards and pipes shall be sized for full flow. Water quality management systems shall be per the Energy Independence Security Act of 2007 (EISA) and DNREC requirements, whichever is more stringent. The minimum velocity of flow in conduits during a design storm shall be 3 fps. The pipe capacity shall be determined so that the calculated hydraulic grade line of the storm sewer drainage system(s) shall not exceed the curb flow line grade in pavements and the finished site grades. Overland drainage outlets shall be provided so that on-site stormwater levels at the buildings are a minimum of one foot below the first floor elevation and building openings for the 100-year return frequency. No buildings shall be placed over existing storm sewer pipes. Storm drainage collection, conveyance, water quality, recharge and subsurface design shall be in accordance with the State of Delaware Stormwater Regulations and Design Guidance and Standards applicable at the time of application to DNREC and as applicable during the design, review and construction phases.

3.3.4.4 Manholes. Manholes shall be located at intersections and changes in alignment or grade. Intermediate manhole maximum spacing shall be 250 feet for pipes 36 inches or less in diameter or box drains with the smallest dimension less than 36 inches. Maximum spacing for intermediate manholes on larger pipes and drain boxes shall be 500 feet. Manholes and manhole appurtenances shall be precast concrete. Shape manhole inverts to the shape of the pipe with cast-in-place concrete after installing pipes. The manhole lid shall have a 24-inch minimum opening as measured from the face of the wall or ladder where applicable. Manhole lids shall have "Storm Sewer" cast in the lid pattern.

3.3.4.5 Drainage of Grass Areas. Minimum slopes across grass surfaces shall be one percent. In grass areas, overland sheet flow shall be held to a maximum length of 100 feet or the length that can be shown not to erode the surface vegetation; then, a ditch, a swale or an inlet must be used. Minimum slopes in ditch or swale centerlines shall be governed by the Delaware State Stormwater Regulations. Field inlets and an underground collection system shall drain open areas. Ditch or swale side slopes shall not be steeper than 1V: 3H and maximum swale depth shall be 24 inches. Storm drain pipe, sheet flow surfaces, and swales shall be designed to prevent standing water under

normal conditions. Surface drainage conveyances with parameters greater than outlined here shall be designed as channels, see 3.4.7 below. Minimize the amount of grassed area drained overland across sidewalks, parking areas or roads.

3.3.4.6 Drainage of Roads and Pavements. Provide a positive crown in all streets and roads. Minimum transverse slopes in streets and roads shall 1.5% and the maximum cross slope shall be 2.08%. The preferred roadway cross section is a crowned roadway section with 2.0% transverse cross slopes. Minimum sheet flow slopes across parking area and other paved areas shall be 1.0%. Curbs and gutters shall be installed at a minimum longitudinal slope of 0.30%. Pavement collectors for stormwater shall be by curb inlets and gutters, or drop inlets. Gutter spread (or inlet approach spread) in roads shall be pursuant to DelDOT requirements. The amount of runoff to any one inlet in roads and parking areas shall not exceed the capacity of that inlet. The maximum spread allowable for determining inlet capacity shall equal that allowed for gutter spread in roads. The maximum spread allowable for determining inlet capacity in parking areas shall be two inches , whichever is less. Coordinate drainage at and along public or installation roadways with the Delaware Department of Transportation.

3.3.4.7 Materials. All materials shall be in accordance with the State Department of Transportation (DOT) Specifications and local drainage authority standards. Pipe for culverts and storm drains shall be of reinforced concrete.

3.3.4.8 Field Quality Control for Storm Drainage System. The Contracting Officer will witness field inspections. Testing procedures and requirements shall comply with State DOT and local drainage authority requirements. The Contractor shall coordinate with the local drainage authority for required inspections and pay associated fees.

3.4 DRAINAGE.

3.4.1 Design storm sewer and channel (ditch) conveyance of storm water runoff from areas within the site. Grading should manage site runoff to maintain rate of flow and quantity to pre-construction levels, or reduce site runoff where possible.

3.4.2 Off-site drainage areas that will contribute to the site drainage system shall be confirmed. This drainage shall be diverted around or through the site and outlet downstream of the on-site drainage discharge outlet point. Runoff at each discharge outlet point cannot be greater in the post-construction condition than in the pre-construction condition. Contractor to provide computations necessary to demonstrate compliance with DNREC regulations and requirements.

3.4.3 Site contours and drainage features shall ensure reasonable runoff volumes and travel times into individual catch basins and ditches, etc. Sewers shall be sized and sloped to adequately convey these flows with a minimum velocity of 3 fps.

3.4.4 Comply with state or local setback requirements for wetlands and water resource features.

3.4.5 Federal, State and local regulations regarding the design of stormwater management systems shall be considered the minimum design criteria and should apply. Additionally, minimize the impact of construction activities on drainage and

prevent loss of soils by water and wind erosion. In accordance with the requirements of the Energy Independence and Security Act of 2007, this project shall utilize site planning, design, and construction strategies to maintain or restore the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of storm water runoff flow. Low impact development strategies can be used to meet the requirements of the law. Low impact development (LID) is a storm water management strategy concerned with maintaining or restoring the natural hydrologic functions of a site. UFC 3-210-10, low impact development, provides guidance for the development of LID strategies.

3.4.6 Coordinate and provide free-draining outlets into the storm sewer system for roof drains if hydraulic disconnection is not possible.

3.4.7 Design channel linings for long term stability under design flow conditions. Design energy dissipaters, rip rap scour protection, ditch blocks or weirs and inlets to maintain system in a stable configuration under operating conditions.

3.4.8 The drainage system shall collect and convey design flows to infiltration areas, swales, detention areas, inlets, channels and grates. Provide flow capacity and overflow provision to prevent flooding of buildings and primary roadways.

3.5 ROADWAYS AND PAVEMENTS.

3.5.1 At a minimum, roadways shall be designed to accommodate the turning movements of the local Fire Company ladder truck (AASHTO). The Contractor shall demonstrate, by graphical means, that the site layout geometrics accommodate the design vehicle.

3.5.2 Design traffic control signage and striping to allow for safe on-site traffic control and routing. Traffic control signs and striping shall be reflectorized and meet State Department of Transportation criteria for visibility.

3.5.3 Provide concrete-filled steel pipe bollards to protect any buildings, equipment, transformers, meters, etc. located within 3 feet of roadways, drives, and parking areas. Bollards and 12-inch high curbs are to be used to comply with ATFP requirements. Contractor to prepare a plan layout illustrating proposed compliance with ATFP requirements.

3.5.4 Concrete (rigid) or bituminous (flexible) pavement may be used. Sidewalks, driveway entrances, dumpster pads, and aprons are to be concrete. Pavement materials shall meet the requirements as geotechnical report and the applicable criteria in Part 2.

3.5.5 **Design.** Pavements shall be designed based on the anticipated loading frequency, civilian vehicle types, trash or other service vehicle types as well as emergency vehicles anticipated to arrive at this facility. Contractor shall furnish design basis for pavement design for approval. The resulting pavement sections will be as determined in the Contractor's Geotechnical Report.

3.5.5.1 The Contractor is advised to use caution when using SUPERPAVE to ensure that the SUPERPAVE design technique is correctly applied to the project. This paragraph is presented to warn the DB Contractor of possible inappropriate results when evaluating binder grades for SuperPave designed pavements. It is the Corps' experience that binder grades for parking lots have been improperly chosen resulting in easily rutting unacceptable pavements. The common characteristic was that the State DOT standard specification was used resulting in the usage of a lower grade binder. This is an inappropriate standard since the DOT recommendations are intended for use in pavements with high speed traffic. It is highly recommended that the LTPPBind program be used when determining the proper binder grade with the following standard selections: "Desired Reliability" = 98%; "Traffic Adjustment" = SHRP; "Traffic Speed" = STANDING for parking lots and entrances, and SLOW for other low-traffic roads. Also, see the Outline Technical Specifications.

3.5.5.2 Plans and specifications shall detail all of the specific aggregates proposed in the pavement design per state DOT designations and gradations.

3.6 **CIRCULATION AND PARKING.** The vehicular and pedestrian circulation system shall promote safe, efficient movement of vehicles and pedestrians within the site area. The following criteria shall be considered for designing streets and drives for vehicles and pedestrians:

3.6.1 **Pedestrian Circulation.** Pedestrian circulation should be safe and separate from vehicle circulation to the greatest extent possible. Provide good sidewalk layout to connect all building entrances with parking and site facilities and existing walks. Pedestrian circulation should be based on natural circulation. Design pedestrian concentration areas with adequate paved area. A secure pedestrian connection shall be provided between the new facility main building and the facility entry gateway.

3.6.2 **Vehicular Circulation.** Vehicular circulation layout shall be determined by applying the design vehicle templates to the site design. The passenger car class includes passenger cars and light delivery trucks, such as vans and pick-ups. The passenger car template is equivalent to the non-organizational privately owned vehicle (POV). The truck class template includes single-unit trucks, truck tractor-semitrailer combinations, and trucks or truck tractors with semi-trailers in combination with full trailers. The American Association of State Highway and Transportation Officials (AASHTO) provides templates showing the turning movements for design vehicles. Obtain templates and utilize them during the design of the facility. Provide the vehicle clearances that are required to meet traffic safety for emergency vehicles, service vehicles, and moving vans.

3.6.3 **Vehicular Parking.** Vehicle parking spaces and counts shall be as indicated on plans. POV parking spaces are to be a minimum of 9 ft by 18 ft. Drive aisles shall be in accordance with Sussex County and State Fire Marshal requirements. All handicap POV parking lots shall meet the ADA Accessibility Guidelines for accessible parking spaces. The DEARNG understands that certain areas of the project site may need to be closed for a period of time during construction. Contractor to propose duration of area closures in CPM schedule submitted as part of proposal. Should it be determined that it is necessary by the DEARNG, Contractor shall provide the means for sufficient spaces

to offset the temporary loss of parking (excluded handicapped spaces). These spaces can be moved around during construction.

3.6.4 **Life Safety.** Exit doors which discharge into paved areas providing vehicular access to a building shall be protected to assure that exit door swing cannot be obstructed by vehicles. In such areas, provide curbs, bollards or similar physical barriers to prevent parked or moving vehicles from impeding full swing of exit door and pedestrian route away from the building.

3.7 **PERMITS AND COORDINATION WITH LOCAL AUTHORITIES OR SERVICE PROVIDERS AND PERMITS.**

3.7.1 **Streets, Rights Of Way, and Street Access.**

3.7.1.1 The local roadway authority is: the Delaware Department of Transportation

3.7.1.2 No entrance work is anticipated at this time.

3.7.1.3. Obtain a copy of requirements or guidelines for interior roadway design and construction from the local roadway authority. Meet the requirements and guidelines and obtain permit for access and pay fees for construction.

3.7.2 **Water Supply.**

3.7.2.1 The local water utility is: Sussex Shores.

3.7.2.2 The Contractor shall coordinate as needed with Sussex Shores and the Office of Drinking Water.

3.7.2.3 Obtain a copy of requirement or guidelines for water system construction from the local water utility. Meet the requirements and guidelines and obtain approval for connection and pay fees.

3.7.3 **Wastewater Collection and Treatment (Sanitary Sewer).**

3.7.3.1 The local wastewater and sanitary sewer utility is: Sussex County Public Works.

3.7.3.2 Preliminary coordination with the local wastewater and sanitary sewer utility indicated that the Contractor shall provide the following: Refer to Sussex County Public Works requirements.

3.7.3.3 Obtain a copy of any requirements or guidelines for sanitary sewer system construction from the Local utility. Meet the requirements and guidelines and obtain permit for connection and pay fees.

3.7.4 **Natural Gas**

3.7.4.1 Natural Gas is not available on this site.

3.7.5 **Drainage (Storm Sewer)**

3.7.5.1 The local drainage authority is: DNREC Soil and Watershed Stewardship. The point of contact for related issues is: DNREC.

3.7.5.2 Preliminary coordination with the local drainage authority indicated that the project may qualify as a Standard Plan.

3.7.5.3 Obtain a copy of requirement or guidelines for drainage system construction from the local drainage authority. Meet the requirements and guidelines and obtain permits and pay fees.

3.7.6 **Land Use (Sussex County)**

3.7.6.1 The local land use authority is: Sussex County.

3.7.6.2 Preliminary coordination with the local land use authority indicated that the Contractor shall provide the following: Site Plan

3.7.6.3 Obtain a copy of requirement or guidelines for land development and land use authority. Meet the requirements and guidelines and obtain permits and pay fees.

3.8 **DEMOLITION.**

3.8.1 Materials shall be disposed of off government property in a state permitted landfill. Obtain required demolition permits and disposal permits. Obtain approval of the disposal site from the Contracting Officer. Cap and remove existing connections in accordance with Section 3.3 of this Part.

3.9 **CLEARING AND GRUBBING.**

3.9.1 Clear and grub all trees and vegetation necessary for construction, but save as many trees as practical.

3.10 **EARTHWORK.**

3.10.1 The Contractor is responsible for defining earthwork requirements in the geotechnical report and in the Specifications. This includes provisions for recompaction, replacement, and improvement of on-site soils to bring soil movement parameters to be achieved during construction for settlement, swell, and bearing capacity within accepted standards for building, pavement, and utility construction.

3.10.2 The Contractor shall be responsible for following the Delaware State Stormwater Regulations (DSSR). DNREC has requirements for Responsible Person in Charge for earth-disturbing activities including Certified Construction Reviewer. Plans must be prepared in accordance with the DSSR and the Delaware Erosion Control Handbook (DESCH), current edition. The Contractor shall prepare the requisite documents and plans in accordance with the DSSR and DESCH including, but not

limited to: detailed sequence of construction, erosion control measures, and vegetative and stabilization practices.

3.11 BORROW MATERIAL.

3.11.1 Obtain borrow material required for construction from sources off government property. Borrow materials are to be free of hazardous materials and contaminants, waste and deleterious materials. Provide test results to the Government for a composite sample from each borrow site to verify compliance to these conditions or provide documents demonstrating compliance with State and Installation regulations regarding transport of borrow materials that are free of hazardous materials or contaminants. On site borrow or excess may be used if it meets requirements for which it is to be used.

3.12 OFF-SITE WORK.

3.12.1 The Contractor shall obtain the required approvals, permits and pay associated fees for any work to be accomplished off site as part of this Contract..

3.13 FENCING

3.13.1 New perimeter fencing shall be High Security Fence to match existing. All other security fence shall consist of Chain Link in accordance with UFGS 32 31 13.53. Interior separation fencing is not required to meet the same criteria. Any other interior fencing shall be in accordance with 32 31 13 requirements.

PART 4

SITE ELECTRICAL/COMMUNICATIONS ENGINEERING

4.1 UTILITY POWER.

4.1.1 Coordinate electric power service with Delmarva Power Company and the National Guard. Confirm in writing the service provider's requirements for an underground primary line, pad-mounted transformer, metering, and underground secondary service. The Electrical Engineer shall provide Delmarva Power with load calculations, current characteristic requirements, dimensioned site plan, and additional information as required to properly coordinate and order electric service to the facility. Pay required design and installation fees; initiate application for service; and assist the Government in completing application for service, accepting installation of service, and start-up of service. Coordinate meter location. The Government requires the ability to measure and monitor hourly electricity consumption for the facility. Coordinate with the local electric service provider for metering that provides a digital output.

4.1.1.1 Obtain a copy of any requirements and/or guidelines for electric service installation from Delmarva Power. Provide equipment and work designed to meet the requirements and guidelines.

4.1.1.2 The Contractor shall obtain any available rebates from the utility and credit those rebates to the Government in the bid.

4.1.1.3 Provide grounding electrode system as called out in UFC 3-520-01.

4.1.1.4 The secondary power supply line shall be sized in accordance with the full load rating of the service equipment and to accommodate any future projected demand. Spare secondary ducts shall be provided in accordance with UFC 3-550-01.

4.1.1.5 The Dearing BBTS site is not understood to meet the UFC 3-600-01 definition for reliable power. Therefore, if a fire pump is required, then a diesel fire pump or an electric fire pump with a connection to the standby generator serving the facility shall be provided. The project is programmed to include a standby generator sized to back up the total facility load including an electric fire pump if required. Provide a design in accordance with NFPA 110, Standard for Emergency and Standby Power Systems and ensure that it is located away from areas adverse to noise and fumes, to include fresh air intake louvers.

4.2 EXTERIOR POWER.

4.2.1 Provide new underground service and Transformer for the building and site lighting

4.3 EXTERIOR LIGHTING

4.3.1 Exterior lighting shall comply with state and local codes, IESNA recommendations, and UFC 3-530-01.

4.3.1.1 Exterior lighting (parking lot, street, building, etc) shall be LED. Parking lot and security lighting shall be provided at a minimum maintained horizontal illuminance level of 0.5 foot-candles average and shall have a uniformity ratio, maximum to minimum, of 15:1 or less. All building entrances shall be illuminated to 2 foot-candles average with a uniformity of 2:1 average to minimum horizontal. Provide lighting poles, pole bases, lighting fixtures, under-ground conduits, wirings, and photocell assembly, one per pole or one per fixture, as required. Lighting shall be provided to meet the LEED requirement for light pollution. Wall mounted building lights shall be LED fixtures. Provide ground mounted LED lighting for Project Monument Sign. Lighting control shall consist of dusk to dawn photocell, timer and contactor.

4.4 TELECOMMUNICATIONS SERVICE.

Telecommunications/data service shall be obtained from the existing communications manhole (TBD). Provide a 6-pr multimode fiber, 6-pr single mode fiber, 25-pr CAT-6 copper and 2-spare 4" conduits from manhole CMH-12 to the new Communications Room in the CSMS. Terminate at both ends and provide TVSS protection at the Barracks Communications Room.

4.4.1 The Contractor shall design, furnish, and install all conduit, wiring, outlets, jacks, and associated equipment within the Barracks building. All wire shall be conduit run.

4.5 CABLE TELEVISION (CATV).

4.5.1 Provide CATV service wiring and coordinate with the local CATV service provider. Coordinate point of demarcation to be located in the IT/Telecom Rm.

4.5.1.1 The Contractor shall design, furnish, and install all conduit, wiring, and outlet boxes within the CSMS for cable television. Coordination with local cable TV provider during the design process is required.

PART 5

LANDSCAPE ARCHITECTURE

5.1 QUALITY ASSURANCE.

5.1.1 **Source.** Plant varieties shall be nursery grown or plantation grown stock. They shall be grown under climatic conditions similar to those in the locality of the project.

5.1.2 **Quality.** Well-shaped, vigorous, healthy plants having healthy and well-branched root systems shall be provided. Plants shall be free from disease, harmful insects and insect eggs, sunscald injury, disfigurement, and abrasion. Balled and burlapped and container grown plants shall be in accordance with American Standard for Nursery Stock. Bare root plants are generally not acceptable.

5.2 SOIL TESTING.

5.2.1 **Percolation Test.** Test for percolation shall be done to determine positive drainage of plant pits and beds. All soil and drainage conditions detrimental to the growth of plant material shall be identified and a proposal correcting the conditions shall be submitted.

5.2.2 **Planting Soil & Topsoil Test.** A soil test shall be performed for pH, chemical analysis, and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for the type and variety of plant material specified.

5.3 INSTALLATION.

5.3.1 **Plant Material Installation.** Verify the location of underground utilities. When obstructions below ground or poor drainage affect the planting operation, proposed adjustments to plant location, type of plant, and planting method or drainage correction shall be submitted. The plant material shall be installed during appropriate planting times and conditions. The planting operation shall be performed only during periods when beneficial results can be obtained. When special conditions warrant a variance to the planting operations, proposed planting times should be submitted.

5.3.2 **Maintenance During Planting Operation.** Installed plants shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed and shall continue until the plant establishment period commences.

5.4 ESTABLISHMENT PERIOD.

5.4.1 **Plant and Seed Establishment Period.** When the contractor has completed the planting operation and has notified the Contracting Officer in writing, the date of completion, the plant establishment period for maintaining seeded and planted materials in a healthy growing condition shall commence and shall be in effect for the following 12 months. When the planting or seeding operations extends over more than one season or there is a variance to the planting or seeding times, the establishment periods shall be established for each portion of work completed.

5.4.2 **Maintenance during Establishment Period.** The maintenance of seed and plant material during the 12 month plant establishment period shall include watering, straightening plants, protecting plant areas from erosion, maintaining erosion material, supplementing mulch, maintaining edging of beds, checking for girdling of plants and maintaining plant labels, weeding, removing and replacing unhealthy plants.

5.4.3 **Unhealthy Plant.** A plant shall be considered unhealthy or dead when the main leader has died back, or 25 percent of the crown is dead, or it has been determined that a plant's health is being compromised due to disease or pests. Determine the cause for an unhealthy plant. Unhealthy or dead plants shall be removed immediately and shall be replaced as soon as seasonal conditions permit in accordance with the following warranty paragraph.

5.5 WARRANTY.

5.5.1 **Plant Warranty.** Furnished plant material shall be guaranteed to be in a vigorous growing condition during its individual 12 month plant establishment period. As each unhealthy plant is replaced, the plant establishment and warranty period starts over again for the replaced plant material until the completion of the warranty period. It will be the contractor's responsibility to replace a plant as many times as necessary until the plant completes its 12 month establishment period.

5.6 **LANDSCAPE IRRIGATION.** [The RFP preparer must determine if a permanent automatic underground irrigation system is required by reviewing local and regional codes and regulations, base practices and plant material water demands. If a system is required, insert the requirement. If not required, edit the paragraph to note these are system requirements if a system is provided.] Provide an automatic underground irrigation system complete with piping, encasement for piping, valves, outlets, valve boxes, fittings, sprinklers, drip irrigation specialties, bubblers, quick couplers, rain sensors, moisture sensors and evapotranspiration based controllers for landscaped areas. Provide controller programming, timing schedule, zoning chart and operations and maintenance data.

5.7 TURF and MEADOW GRASSES.

5.7.1 **Seed.** State approved seed of the latest season's crop shall be provided in the original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert

material. Labels shall be in conformance with applicable State seed laws. Seed mixtures shall be proportioned by weight. Weed seed shall not exceed one percent by weight of the total mixture. Seeding shall be installed during appropriate planting times and conditions recommended by the trade for type and variety.

5.7.2 **Sod.** State approved sod shall be provided as classified by applicable State laws. Each individual sod section shall be of a size to permit rolling and lifting without breaking. The sod shall be of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted. If the sod health and survivability has been compromised by drought, parasites, invasive plants, deleterious materials or it's physical structure will inhibit proper installation the sod shall be rejected. Sod shall be machine cut to a uniform thickness of 1 ¼" within a tolerance of ¼" excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch. The limitation of time between harvesting and placing sod shall be 24 hours.

5.7.3 **Temporary Ground Cover.** If there are delays in construction or a quick ground cover is required to prevent erosion, the areas designated for turf or meadow grasses shall be seeded with a temporary seed. When no other turf or meadow grasses have been applied, the quantity of one-half of the required soil amendments shall be applied and the area tilled.

5.7.4 **Turf Establishment.** The turf and meadow grasses shall be installed during appropriate planting times and conditions recommended by the trade for the type and variety of turf specified. The establishment operations shall be performed only during periods when beneficial results can be obtained. Drainage patterns shall be maintained. The turf and meadow grasses shall be installed using the methods recommended by the trade for the type and variety of species specified. Immediately after sodding or seeding, the area shall be protected against traffic or other use by erecting barricades and providing signage as required. When the contractor has completed the seeding or sodding operations and has notified the Contracting Officer in writing, the date of completion, the turf and meadow grass establishment period shall end twelve months after the documented completion of sodding or seeding operations. An unsatisfactory ground cover shall be repaired as soon as sodding or seeding conditions permit. Refer to 5.7.5, 5.7.6 and 5.7.7 for satisfactory ground covers.

5.7.5 **Satisfactory Seeded Turf.** At the end of the establishment period, a satisfactory stand of seeded turf shall be healthy, uniform, close and free of weeds and surface irregularities, with coverage exceeding 95% and bare spots not exceeding 6 by 6 inches.

5.7.6 **Satisfactory Seeded Meadow.** At the end of the establishment period, a satisfactory stand of meadow grasses is defined as coverage exceeding 95% of the established species and bare spots not exceeding 6 by 6 inches.

5.7.7 **Satisfactory Sodded Turf.** At end of the establishment period, a satisfactory stand of sodded turf is defined by a healthy, well-rooted, even-colored, viable turf, free of weeds, open joints, bare areas, and surface irregularities.

5.7.8 **Turf Maintenance during Establishment Period.** (12 months) Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf.

5.7.9 **Meadow Maintenance during Establishment Period.** (12 months) Maintain and establish meadow by watering, weeding, mowing, trimming, replanting, and performing other operations as required to establish a healthy, viable meadow. Roll, regrade, and replant bare or eroded areas and remulch.

5.8 **MISCELLANEOUS.**

5.8.1 **Edger.** Shrub & perennial beds adjacent to turf areas shall include a metal edging system.

5.8.2 **Mulch.** Planting beds & trees shall receive a minimum of 3" organic mulch. Shrub beds are to receive a non-woven weed barrier fabric, perennial beds do not.

5.8.3 **Building Maintenance Strip.** Buildings and accessory units are to receive a minimum 2' wide maintenance strip. The strip shall include mineral mulch, non-woven weed barrier fabric and metal edger.

PART 6

ARCHITECTURAL AND INTERIOR DESIGN

6.1 DESIGN GOAL.

The overall architectural design goal for the BBT Barracks facility is to provide a functional, visually appealing facility that is a source of pride for facility users, and the Installation and the community. The RFP conceptual building drawings present a building design scheme which considers the Army National Guard program and which has been accepted by the Government. This does not preclude the Contractor from making improvements to the design so long as such improvements are consistent with the requirements of the RFP and acceptable to the Government. The building designs are conceptual; the Contractor shall finalize all elements of the design, including exact dimensions. In completing the design, the Contractor will be allowed some latitude in manipulating the plans and elevations to improve functional layout, to accommodate structural, mechanical, electrical and other systems, and to allow flexibility for design/esthetic expression. The spatial relationships and adjacencies must be maintained, unless the Contractor recommends changes to the provided Bridging documents set associated with this RFP, and obtains approval from the Government prior to the bid submission.

Two Design / Planning Concepts

This RFP has two planning concepts for the building design, each of which is a viable solution. Submitters shall establish which concept they are basing their submission on by selecting one of the two options with an "X" in the "Concept Options" section of the Bid form.

For identification reference clarity, these two concepts are titled as follows: **"The Motel Concept"** or **"MC"** and **"The Village Concept"** or **"VC"** respectively. The MC is a two-story single building, with thirty-two private trainee sleep/study Dorm rooms ("SLQ"), along with some common function and service spaces. The VC is six structures with eight SLQ rooms each, along with common spaces similar to the MC. The six structures are paired into three groups, in order for two structures to share a common exterior deck. The location of the VC on the Bethany Post requires that these structures be raised off the ground approximately five feet at the high point, to comply with FEMA flood elevation requirements.

The floor plans across five of the six structures are identical and are mirror each other within the specific grouping. The one structure that varies from the other five is the Handi Cap Accessible unit. ("HC Unit") The HC Unit has essentially the same layout as the other five units, but has HC accommodations, such as a ramp for the exterior desk, HC Bathroom accessories, and HC Kitchen sink. The HC unit also has three additional spaces located on the north end of the building, that are common service functions for all three groupings, including an IT / Data room and two maintenance storage rooms. The supporting drawings, illustrate both concepts. See the corresponding program tables below.

Either of these concepts can employ traditional full on site construction, or manufactured Modular construction. The VC concept in particular was developed to accommodate

modular system construction (see floor plan drawing A-100B). Construction will need to be compliant with the local building codes and US Department of Defense Unified Facilities Criteria (UFC's). Bidders shall include a description of the construction systems with their proposal.

6.1.1 **Site Planning Objectives.**

The site design will follow the two concept options outlined above for the Buildings. Provide a functional layout of building and site elements. The site plan should place emphasis on creating a safe work environment. Arrange vehicular circulation to minimize conflict with pedestrian circulation. Pavement marking and signage shall clearly delineate traffic patterns, even to first time visitors to the site. Integrate sustainable design principles by retaining and using existing topography to advantage; preserve environmentally sensitive areas and reduce overall project impact on the site.

6.1.1.1 Provide a site development plan that incorporates the spatial and functional arrangement of all facility requirements. The plan should ensure an economical, compatible and functional land use development that utilizes the advantages of the site, allows convenient access to the units which the facility supports, and fosters visual order. The site development plan shall show consideration for the site opportunities and constraints, program requirements, and specific site design criteria and guidance provided.

6.1.1.2 See the Civil/Site Planning narrative Part 03 for additional requirements.

6.1.2 **Exterior Design Objectives.**

Design buildings to integrate aesthetically and enhance the visual environment of the installation. Exterior materials, roof forms, and detailing shall comply with the provisions of this RFP, and shall be compatible with the immediate local context. Use durable, low-maintenance materials. Configure building massing and use exterior elements such as entry elements and material detailing to provide human scale, especially at core areas.

6.1.2.1 The Army National Guard has accepted the two conceptual building plans and exterior designs, including the color scheme as discussed herein. Any appreciable change to the building footprint requires Army National Guard acceptance.

6.1.2.2 The exterior materials, colors and aesthetics for both concepts shall be consistent with the materials used with the new Fitness Center building on the Bethany Post: Metal Roofing, Metal siding and decorative CMU.

MC Concept:

- Exterior walls finishes are decorative CMU and metal siding
- Base bid roofing is Standing seam metal and the option is fiberglass shingles.

VC concept:

- Exterior wall finish will be metal siding.
- Base bid roofing is Standing seam metal and the option is fiberglass shingles.

6.1.3 **Interior Design Objectives.**

Arrange spaces in an efficient, functional manner. Provide simple circulation schemes that allow easy wayfinding. Use durable materials and furnishings that can be easily

maintained and replaced. Maximize use of daylighting and operable windows. Verify whether users desire operable windows. Use interior surfaces that are easy to clean and light in color; avoid trendy or bright color schemes. Where feasible, arrange spaces to allow rearrangement of furniture layout. Structure interior spaces to allow maximum flexibility for future modifications.

6.1.3.1 The RFP provides basic finishes and a color palette for most spaces. Contractor's designers are encouraged to develop a more comprehensive finish and color palette for acceptance by the Government, including accent colors and finishes, especially for common-use areas of the building. Such finish and color palette shall include doors, door frames and window frames.

6.1.3.2 Functional space requirements are noted in Part 1 of this Statement of Work. Contractor's designer is to coordinate the layout with the Government. All spaces shall comply with Federal ABA and ADA Accessible Design Guides, and State of Delaware Architectural Accessibility Board Design requirements.

6.1.3.3 Bathrooms:

The Contractor shall develop Restroom layouts in conformance with the requirements of this RFP and the Design Guide, for the acceptance of the Government.

6.1.3.3.1 The floors in the bathroom shall have a 12"x12" slip resistant porcelain tile, and the tub/shower walls shall be 4" x 4" ceramic tile (to ceiling).

Each bathroom is to have a floor mount toilet with full seats and seat covers. vitreous china toilet, and fiberglass tub or shower base with curtain, curtain rod and soap dish. Provide a solid polymer countertop with integral sink with base cabinet having hinged door(s).

6.1.3.3.2 Each room shall include and the following Stainless-steel (SS) accessories, by the Basis of Design manufacturer and product or approved equal:

- Toilet Tissue Dispenser (proprietary) – Bobrick Tissue Dispenser Model B-685, SS, no. 4 finish (satin)
- Mirror – 2'w x 3"h (proprietary) – Bobrick Channel Frame Model B-165 SS.
- Towel Bars – Bobrick B-674 SS Series.
- Clothes Hooks – Bobrick Heavy Duty clothes hook with concealed mounting. Series B-2116.
- Surface-mounted soap dish – Bobrick B-680 Series
- Shower Curtain: Bobrick -Rod – B-6107, with Series 204-1 Shower Curtain Hooks, and Series 204 Opaque, matte white vinyl antibacterial and flame retardant agent Shower Curtain.

- ADA Unit Only: HC grab bars, compliant with ABA/ADA. Bobrick, B-5806 Series. 30"L horizontal, 42"L horizontal, 18"L vertical.

6.1.3.3.3 The plumbing fixture counts shall be based on the following:

- RFP drawing layout

- Army NG Design Guide
- The building code (IBC) minimum requirements.

6.1.3.4 Lounge (MC), Living Room/Dining/Kitchen (VC) & Laundry Room, to have LVT for flooring and walls will be painted GWB. The rooms shall have a window for natural light and exterior views. Minimum ceiling height – 9'-0". One 3' x 4' bulletin board shall be provided.

6.1.3.5 Maintenance Storage (MC), Mechanical, Electrical, and IT spaces in MC to have VCT floor tiles and LVT in VC. Walls will be painted GWB, and minimum ceiling height of 9'-0"

6.1.3.6 The main entrance shall have an interior walk off mat. Interior walls to have 4" vinyl base.

6.1.4 **Material and Product Selection Criteria.** Materials shall meet the requirements of this RFP, which establish a minimum quality level. Higher quality materials will be evaluated more favorably.

6.2 GENERAL ARCHITECTURAL CONSTRUCTION REQUIREMENTS.

6.2.1 The primary Architectural/Structural requirements for the BBTS Barracks Building shall include the following systems:

- Foundations to support building construction
- Superstructure: MC: Steel frame (see Option 1). VC: wood or light gauge steel framing.
- Exterior wall and roof systems to achieve full weather tightness and code compliant R-Value.
- Painted steel and or aluminum frame door systems, for interior-exterior passage in and out of the building for people and vehicles
- Aluminum framed windows for views to the exterior.
- Interior walls to support define and the operational functions
- Interior finishes and millwork to facilitate the operational functions.

6.3 BUILDING REGULATORY REQUIREMENTS.

The Building design shall conform with the following regulatory requirements: (See the Civil narrative Part 3 for additional regulatory requirements).

- **CODE COMPLIANCE:** The drawing submission set shall include a Code Plan that addresses the following requirements: egress capacity and maximum distance, occupancy classification, construction type, allowable area & height, and any fire separation. The design shall be guided by the current version of the adopted International Building Code (2018), and NFPA Life Safety Code 101 (2021). All codes must be verified with the current versions adopted by the State of Delaware and Sussex County.
- **BUILDING PERMIT:** The DB team shall obtain a Building permit from Sussex County.

- NGB & OMB/DFM Approvals: The design documents shall be obtain 60% and 99% design approvals for the design documents from both the National Guard Bureau (NGB), and the State of Delaware Office and Management & Budget/ Dept. of Facilities Management (OMB/DFM).
- For the OMB/DFM 60% submission (and for Permit), State of Delaware Firemarshal approval must be secured for both the site plan and the Building design, and from the State of Delaware Architectural Accessibility board.

6.4 EXTERIOR DESIGN.

6.4.1 **Acceptable Materials and Colors.** The exterior building materials are prescribed below. The intent of design of the exterior elevations for these buildings is that their colors and materials are influenced by the new DEARNG Bethany Beach Training Site Fitness Building, currently under construction. Comply with the materials and color palette outlined in this RFP. Exterior elements of the this project's structures shall comply with the Installation Design Guide (ANG DG 415-5) unless required otherwise by applicable codes or this RFP.

6.4.2 **Exterior Walls.** Exterior Walls: (see Part 1, section 1.10 for Options/Alternates)

6.4.2.1 Exterior walls shall be a composite assembly system as follows:

- Interior finish: Painted 5/8" gyp. board
- Structure:
 - Base Bid: Conventional Steel Post and beam frame with, 6" cold formed metal studs infill.
 - Option 1: 6" cold form structural/bearing metal studs
- Sheathing: 5/8" exterior gyp. board
- Air Barrier: Liquid applied or self adhered
 - R- Value: IECC Table C402.1.3 – Framed walls: R-13 + R-7.5 Ci – Acceptable materials: Poly Iso Rigid board, Spray foam and Mineral Wool batts
- 1 ½" Air Space (MC only)
- Exterior Finish: (See Elevation Drawings):
 - Decorative Ground Face CMU – (3) colors (MC only).
 - Metal Panels with fiberglass standoffs and aluminum "Z" furring.
 - Base Bid: ACM
 - Option 2: Horizontal "V"- Rib exposed

6.4.3 **Roofs.** The roofing system shall have a minimum of Underwriters Laboratory (UL) Class A rating for fire resistance, UL 90 wind resistance rating, and Factory Mutual (FM) I-90 fire and wind resistance rating. The system shall be tested and approved in accordance with FM I-90 UL 580 and local building code requirements. The Roof system assembly shall be a manufacturer's approved complete system and shall include the following:

- Roofing:
 - Base Bid – Standing seam metal roofing
 - Option 3 – Architectural grade fiberglass shingles

performance Level A, Model 2; insulated; top edge closed flush. Frames shall be Level 3, 14 gauge, with continuously welded corners and seamless face joints. Doors and frames shall be constructed of hot dipped zinc coated steel sheet, complying with ASTM A653, Commercial Steel, Type B, minimum A40 coating weight; factory primed. Anchors and accessories shall be zinc coated. Fire-rated openings shall comply with NFPA 80, and the requirements of the labeling authority.

6.4.7.2 Hardware: The following are the minimum hardware requirements:
Design Phase: A meeting to determine the hardware functions of all doors (in the approved floor plan) shall be conducted with the DEARNG project team, the user representatives and Tetra Tech. A follow up meeting shall be conducted prior to ordering the hardware products, to facilitate any desired functional changes.

6.4.7.2.1 All locksets shall be compatible with and use Best Cores.

6.4.7.2.2 The following doors shall be fit out for card readers, All exterior doors, and the corridor entry door for all SLQ Rooms, Mechanical, Electrical and IT rooms. This shall include electric strikes, and or electric locksets/Exit Devices, and concealed conduit to accommodate the electronic security controllers. The Card Readers shall be provided by DEARNG's security contractor.

6.4.7.2.3 Doors shall have a closer, hinges (1 1/2 pair), overhead stops, offset pulls and full weather strip. The Laundry/Vending and Bathrooms shall have Classroom function locksets. The Mechanical, Electrical and Storage rooms shall have Storeroom function locksets. Clothing closets shall have passage locksets. Coordinate appropriate lockable office or other location for access control with Users, and assure space is sufficient to accommodate them.

6.4.7.2.4 Hinges. ANSI/BHMA A156.1; template, full mortise, heavy duty, ball bearing, minimum size 4 1/2 inch x 4 1/2 inch, non-ferrous base metal, non-removable pins.

6.4.7.2.5 Locksets. ANSI/BHMA A156.13; series 1000, Grade 1 mortise locksets, non-ferrous base metal, removable core. Approved manufacturers and product lines: Best 9K Series-Trim 14D, Schlage, ND Series-Trim SPA, Sargent 10 Line-Trim LP

6.4.7.2.6 Closers. ANSI/BHMA A156.4; series C02000, Grade 1, hydraulic, factory-sized, adjustable to meet field conditions. Provide for all exterior doors, all doors opening to corridors, and as otherwise required by codes. At all exterior doors provide overhead holders or closers with hold-open capability. Coordinate additional closer locations with Users.

6.4.7.2.7 Auxiliary Hardware. ANSI/BHMA A156.16. Provide wall or floor stops for all exterior doors that do not have overhead holder/stops. Provide other hardware as necessary for a complete installation.

6.4.7.2.8 Thresholds. ANSI/BHMA A156.21; non-ferrous metal. Provide at all exterior doors.

6.4.7.2.9 Weatherstripping. ANSI/BHMA A156.22. Provide at all exterior doors.

6.4.7.2.10 Kick Plates. ANSI/BHMA A156.6; non-ferrous metal. Provide at all doors with closers.

6.4.8 **Exterior Windows.** Provide aluminum windows complying with American Architectural Manufacturers Association AAMA/NWWDA 101 / I.S. 2. Minimum performance class shall be Heavy Commercial (HC). Minimum wind load, and resulting design pressure and performance grade shall be determined in accordance with the International Building Code (IBC). Provide windows with insulating glass and thermal break necessary to achieve a minimum Condensation Resistance Factor (CRF) of 45. Finish shall be Architectural Class I anodic coating or AAMA 2605 organic coating. SLQs shall have Sliding operable windows, and shall have locks, and fiberglass or aluminum insect screens removable from the inside. Design of glass, glazing, frames, connections and structure shall comply with antiterrorism minimum standards, and other code requirements. Antiterrorism standards are likely to have the most stringent requirements.

6.4.9 **Thermal Insulation.** Provide exterior wall, floor, and roof/ceiling assemblies with thermal transmittance (U-values) required to comply with the IBC energy standard for this building's location. Insulation shall be mechanically or adhesively secured rigid board and shall comply with NFPA minimum flame spread requirements. Loose or blanket insulation shall not be acceptable for this building. The building envelope shall comply with ASHRAE Standard 90.1. Contractor shall verify compliance with minimum zone and building type R-Values for the exterior walls and the roof.

6.5 INTERIOR DESIGN.

6.5.1 **General Guidance.** Interior design guidelines are addressed in the ARNG DG-415. Unless otherwise noted the finishes are established in the DG-415. The preferred or first-listed finishes are the minimum requirement of this RFP. The STC ratings for spaces include sound transmission above space ceiling. Additional project specific requirements are listed below and in the table in Part 1 of this Section 01 02 00.00 48.

6.5.1.1 See drawing A110.1 for the basis of design for the interior finish materials and colors for this building, confirm final selections with owner:

6.5.2 **Floors.** Concrete Slab. Floor finish materials shall be as specified in the Design Guide; where multiple flooring materials are listed in the DG, the first flooring material listed shall be the minimum requirement for this project, unless noted elsewhere in this RFP.

6.5.3 **Ceramic Floor Tile.** Comply with ANSI A 137.1 and the recommendations of Tile Council of America (TCA) Handbook For Ceramic Tile Installation. Provide marble threshold under doors where a ceramic tile floor meets a different floor finish.

6.5.4 **Interior Walls and Partitions.** Painted GWB.

6.5.5 **Light Gauge Metal Support Systems.** Non-load bearing metal studs and furring shall comply with ASTM C 645; stud gauge shall be as required by height and

loading, but shall not be less than 25 gauge. Maximum stud spacing: 16 inches on center. Provide galvanized finish.

6.5.6 **Gypsum Board.** Comply with ASTM C 1396. Minimum panel thickness shall be 5/8 inch. Provide Type X panels in fire-rated assemblies. Provide moisture resistant panels at locations subject to moisture. Provide abuse-resistant panels for corridors and other areas of likely high circulation use. Joint treatment: ASTM C 475. Screws ASTM C 646. Drywall installation: ASTM C 840. (3) coat paint finish.

6.5.7 **Ceramic Wall Tile.** Comply with ANSI A 137.1 and the recommendations of Tile Council of America (TCA) Handbook For Ceramic Tile Installation. Substrate for wall tile shall be cement backer board (gypsum board is not acceptable).

6.5.8 **Ceilings.** Painted GWB. Non-combustible construction is required, even where combustible materials are allowed by code. Provide access panels where required for access to equipment, controls, valves, boxes, etc.

6.5.9 **Interior Doors and Frames.** Provide hollow metal frames, and wood maple veneer solid doors.

6.5.9.1 **Hollow Metal Doors.** Comply with ANSI A250.8/SDI 100. Doors shall be Level 2, physical performance Level B, Model 2; factory primed. Anchors and accessories shall be zinc coated. Frames in masonry shall have bituminous back-coating, plaster guards, and shall be grouted solid.

6.5.9.2 **Hollow Metal Frames.** Comply with ANSI A250.8/SDI 100. Frames shall be Level 2, 16 gauge, with continuously welded corners and seamless face joints; factory primed. Anchors and accessories shall be zinc coated. Frames in masonry shall have bituminous back-coating, plaster guards, and shall be grouted solid.

6.5.9.3 **Fire-rated and Smoke Control Doors and Frames.** Comply with International Building Code (IBC), NFPA 80, and requirements of labeling authority. Doors and frames shall bear labels from IBC approved testing laboratory. Comply with positive pressure testing requirements of IBC.

6.5.10 **Door Finish Hardware.**

6.5.10.1 **Hinges.** ANSI/BHMA A156.1; template, full mortise; heavy duty, ball bearing on doors with closers; standard duty anti-friction bearing on doors without closers. Minimum size: 4 ½" by 4 ½".

6.5.10.2 **Locksets on Interior Doors.** ANSI/BHMA A156.13; series 1000, Grade 1 mortise locksets, non-ferrous base metal, removable core Locks shall be compatible with Best cores.

6.5.10.3 **Closers.** ANSI/BHMA A156.4; series C02000, Grade 1, hydraulic, factory-sized, adjustable to meet field conditions. Provide for all doors opening to corridors and as required by codes.

6.5.10.4 Auxiliary Hardware. ANSI/BHMA A156.16. Provide wall stops for all doors that do not have overhead holder/stops. Provide other hardware as necessary for a complete installation.

6.5.10.5 Kick Plates. ANSI/BHMA A156.6; non-ferrous metal. Provide at all utility rooms.

6.5.10.6 Lockset Functions: Bathrooms shall have "Privacy" locksets. Mechanical Rooms shall have "Storeroom" locksets.

6.5.11 **Casework.**

6.5.11.1 Vanity Countertop at Toilets. Countertops shall be solid surfacing material, with integral coved backsplash and integral bowls. Substrate shall be two layers of 3/4 inch thick exterior grade plywood. Reinforce countertop with concealed steel angles so that top will not deflect more than 1/4 inch when a 250 pound load is applied at mid-span. Comply with AWI Section 400 Custom Grade requirements.

6.5.12 **Interior Signage - NA**

6.5.13 **Fire Extinguishers.** Provide (1) semi-recessed fire extinguisher cabinets in all occupied spaces. Provide surface-mounted fire extinguisher cabinets in storage, mechanical/electrical. Fire Extinguishers shall be provided by the government. Contractor to provide location, size and type for all required extinguishers as part of the design.

6.5.14 **Government Furnished Government Installed Equipment.** The government shall provide all movable furniture.

6.5.15 **Contractor Furnished/Contractor Installed Equipment**

6.15.1 Clothes washer and dryer- Provide (2) for MC and (1) for each VC building. Units shall be front loading commercial 30 LB capacity washer and dryers, by Speed queen or approved equal.

PART 7

STRUCTURAL DESIGN

7.1 **GENERAL REQUIREMENTS.** Project includes the construction of a new two-story Barracks building (approximately 12,430 total SF). See Part 6 – Architectural and Interior Design for a description of the two planning concepts (MC and VC).

The Design-Build Contractor shall engage a licensed professional engineer (PE), with a minimum of 10 years' experience designing similar type structures, who shall be responsible for the design of the completed structural system for the building. The general and specific criteria detailed herein shall be used for structural loading, design and construction of structural systems, including manufacturing, erection, supervision, testing and quality assurance of the completed installation of the building(s). The complete structural system for the building shall include deep/shallow foundations, roof and floor framing, roof and floor diaphragms, lateral load stability, framing and connection of architectural features, and support of mechanical, electrical, plumbing equipment and photovoltaic roof panels. The structural system must be compatible with the intended building functions. Refer to Part 2 for Applicable Criteria.

7.1.1 **Structural Systems.** The structural systems selected shall conform to all Applicable Criteria as well as industry standards and commonly accepted methods of practice. The Government prefers steel, cold-formed metal framing or steel frame with cold-formed metal framing infill construction for the building structures. Alternative roof and wall structural systems of equivalent quality and performance, and which meet the requirements of this RFP, will be considered.

7.1.2 **Structural Engineer.** The structural engineer is responsible for the design of the Barracks Building and all site structures. The structural design of the buildings shall be coordinated with the design of each discipline and shall be in accordance with the current versions of the International Building Code (IBC), the Unified Facilities Criteria, and all applicable local governing codes. Structural calculations shall be checked and initialed by a registered structural engineer other than the original design engineer, prior to submissions.

7.1.3 **Geotechnical Investigation.** The structural engineer shall base foundation designs on the data from the contractor's geotechnical investigation and report, supplemented by the government provided information found in the Appendix appropriate for the structural systems determined and the loads imposed on the foundations.

7.1.4 **Drawings.** Drawings prepared by the Design/Build Contractor shall contain notes required by IBC section 1603.

7.2 **STRUCTURAL WORK.** The structural work consists of, but is not limited to, design and construction of:

7.2.1 Building Foundations. Spread footings, continuous strip (wall) footings, piles, drilled piers or others as recommended by the final Contractor's geotechnical report. Refer to Attachment A for Subsurface Characterization Report, to be used in preparation of D/B bids. Soils improvement, building design and building detailing shall be consistent with maximum allowable settlement criteria of ½" differential settlement and 1" total settlement, unless otherwise accepted by the Government. For the VC, the foundation system is anticipated to extend above grade elevations to comply with FEMA flood elevation requirements. This is assumed to be accomplished by concrete or timber piers..

7.2.2 Slabs On Grade. Building slabs on grade shall be designed and constructed in accordance with UFC Standards and as recommended by the final geotechnical report. Building slabs on grade shall be placed over a polyethylene sheeting vapor retarder with a 10 mil minimum thickness, with corresponding maximum permeance rating of 0.04 perm. Where moisture is a critical issue under the floor covering, a vapor barrier is required to reduce the maximum permeance rating to 0.01 perm. A minimum 6-inch of capillary water barrier shall be provided under vapor retarder/barrier. The maximum size of the barrier aggregate shall be 1 ½ inch and no more than 2 percent by weight shall pass a No.4 sieve.

7.2.2.1 In no case shall a slab on grade be less than 4-inches thick. All slabs-on-grade shall, as a minimum, be reinforced with small deformed reinforcing bars at 12"-16" spacing in lieu of welded wire fabric. Alternatively, the Contractor may demonstrate equivalent protection using macro-fiber reinforcing.

7.2.2.2 Slabs shall be placed in lane fashion. The area bounded by crack control joints shall not exceed 250 square feet and distance between crack control joints shall not exceed 15 feet. Crack control joints may be construction joints, contraction joints, expansion joints, or isolation joints. Reentrant corners in slabs shall be reinforced with two #4 bars, 4 feet long, placed diagonally to the corner. Discontinuous joints shall be reinforced with two #4 bars, 4 feet long, placed opposite the end of the discontinuous joint.

7.2.2.3 The flatness and levelness of floors shall be carefully controlled and the tolerance shall be measured by the F-number system of ACI 117. The Contractor shall furnish an approved floor profilograph or other equipment capable of measuring the floor flatness (FF) number and the floor levelness (FL) number in accordance with ASTM E 1155. The Contractor shall perform the tolerance measurements within 24 hours after final troweling of floor slab while being observed by the Contracting Officer. The tolerances of surfaces beyond the limits of ASTM E 1155 (the areas within 24 inches of embedments and construction joints) shall be acceptable to the Contracting Officer. Tolerances shall meet the following requirements:

Barracks Building Slab-on-Grade: FF 25; FL 20

7.2.3 Load Bearing Walls. Including cold-formed metal framing wall construction acting as primary vertical load carrying members and/or shear walls. Exterior door jambs and headers (if any) shall be built-up cold-formed metal framing sections for increased strength and stiffness.

7.2.4 **Non-Load Bearing Walls.** Including cold-formed metal framing stud wall construction.

7.2.5 **Framing Members.** Including steel framing and steel roof trusses, as well as pressure-treated wood/timber or cold-formed metal framed walls and roof trusses. The Army National Guard prefers that any exterior wall columns be concealed in, or protrude only slightly from, the wall construction. Column locations in all spaces shall be coordinated so they do not interfere with space functionality.

7.2.6 **Horizontal Framing Members.** Including roof decks and diaphragms, roof beams and girders, joists and trusses.

7.2.7 **Connection Details.** All interconnections of structural members including foundations, walls, framing members, slabs, roof deck, etc. The category also includes all fastening requirements of such details, and any special detailing necessary for seismic, wind and/or Anti-Terrorism/Force Protection (AT/FP) resistance.

7.2.8 **Column Bases.** Where possible, all column base plates and anchor bolts shall be completely encased in concrete.

7.2.9 **Non-Structural Connections.** Including attachments for architectural, mechanical and electrical elements to the structural systems. Includes any special detailing for attachments of such items for seismic, wind and/or AT/FP resistance.

7.2.10 **Other Considerations.** Including but not limited to expansion, construction, movement and control joints, changes in floor elevations, and special loads.

7.3 **STRUCTURAL DESIGN CRITERIA.** Structural loads and design, including deflection limitations, shall be in accordance with the codes and other Applicable Criteria listed in Part 2 and all codes referenced therein and as modified below. Structural loads include all dead, live, snow, ice, flood, wind, seismic, earth, AT/FP as applicable.

7.3.1 **Dead Loads.** Dead loads shall be the assemblies self-weight and shall include additional collateral loads.

7.3.2 **Photovoltaic Roof Panels.** Loads associated with photovoltaic roof panels shall be incorporated into the design of the building's structural systems. Final design loads and support of the panels shall be as required by the final product manufacturer's written product data and instructions. It shall be assumed that photovoltaic roof panels will be installed parallel to the roof(s) surface. Minimum dead load: 15 psf.

7.3.3 **Minimum Live Load Requirements.** As a minimum, the structure(s) shall be designed for the minimum uniformly distributed live loads and minimum concentrated live loads provided in Table D-1 of UFC 3-301-01 Structural Engineering.

7.3.4 **Wind Loads.** As a minimum, the structure(s) shall be designed for 125 mph basic wind speed (3-sec peak gust), exposure category D following the criteria in IBC/ASCE 7, in addition to the codes and other Applicable Criteria listed in Part 2. In

addition, structure(s) shall be designed for Hurricane-Prone Region and Wind-Borne Debris Region requirements, where applicable. All parts of the structure shall be designed for the specified wind velocity and shall be connected together to provide an integrated resistance to high wind effects.

7.3.5 **Seismic Loads.** As a minimum, the structures shall be designed using minimum IBC/ASCE 7-related seismic coefficients $S_s = 9.3\% g$ and $S_1 = 3.6\% g$. The anticipated site classification is E and the anticipated Seismic Design Category is B. Both shall be confirmed by the final geotechnical report.

7.3.6 **Snow Loads.** Ground snow load – minimum 20.0 psf. Drifting snow, unbalanced snow and rain-on-snow shall be considered in accordance with the codes and other Applicable Criteria listed in Part 2

7.3.7 **Frost Penetration/Minimum Footing Cover.** Minimum cover for foundations for heated building perimeter and unheated structures shall be as stated in the Unified Facilities Criteria, or thirty inches (30”) minimum, whichever is greater.

7.3.8 **Floor Live Loads.** All other building floor live loads shall be as determined in accordance with the codes and other Applicable Criteria listed in Part 2.

7.3.9 **Importance Factors.** For the purpose of structural calculations, all buildings included in project shall be considered a Risk Category II building, as defined in the International Building Code, with a seismic design importance factor of 1.00; and a snow and ice design importance factor of 1.00.

7.3.10 **Equipment Loads.** Structures shall be designed for the weights, dynamic loads and other effects of mechanical and electrical equipment, and any permanently mounted equipment.

7.4 MATERIALS.

7.4.1 **Concrete.** All exterior concrete slabs on grade, elevated concrete slabs, and concrete foundation walls shall have a minimum compressive strength of 5,000 psi at 28 days (verified by testing). All other concrete shall have a minimum compressive strength of 4,500 psi at 28 days (verified by testing). As a minimum, reinforcing steel shall be ASTM A615, Grade 60. Macro-fiber reinforcing may be used in slabs-on-grade to replace shrinkage reinforcement provided the contractor can provide an acceptable slab finish using the macro-fiber reinforcing.

7.4.2 **Concrete Reinforcing.** As a minimum requirement, all concrete shall be reinforced, at least to minimum ACI 318 requirements for temperature, shrinkage, flexural, and other ACI stipulations. The reinforcing of concrete walls, continuous footings, and tie and bond beams shall be continuous and, therefore typical details showing the arrangement of reinforcing at corners and intersections of these members shall be shown on the drawings.

7.4.3 **Concrete Reinforcement.** All detailing and materials used for concrete reinforcement shall be in accordance with ACI 318, latest edition.

7.4.4 **Steel Embedment.** Steel embedded in concrete for such purposes as exterior railing, handrails, fence, base plates, bollards, anchor bolts, etc. shall be hot-dipped galvanized unless otherwise directed.

7.4.5 **Structural Steel:**

7.4.5.1 **General:** Structural steel shall conform to the American Society of Testing Materials (ASTM) A992 unless a higher strength steel is desired. Steel channels and angles shall be ASTM A572, Grade 50. Steel plate and bar to be ASTM A36. Cold-formed hollow structural sections to be ASTM A500, Grade C. All structural steel shall be prime painted except where steel is to be embedded in concrete, or adjacent to welds, or at slip-critical bolted connections. Exterior exposed steel (i.e. lintels) shall be galvanized.

7.4.5.2 **Shop and Field Connections.** Shop connections for structural steel shall be welded, and generally field connections shall be made with high strength bolts (ASTM A325) in bearing type connections. All connections shall be designed by the structural engineer of record and detailed on the final plans. Connection angles shall be a minimum 5/16-inches thick and bolts shall be a minimum of 3/4-inches in diameter.

7.4.5.2.1 After erection, the field bolt heads and nuts, field welds, and any abrasions in the shop coat shall be cleaned and primed with paint of the same quality as that used for the shop coat.

7.4.6 **Cold-Formed Steel Framing.** All cold-formed steel framing shall be formed from steel that conforms to the requirements of ASTM C955, Grade 33 or higher, having a minimum yield of 33 psi. Minimum uncoated steel thickness (design thickness times 0.95) shall be 20 gage structural (33 mils). All cold-formed steel framing, connectors, etc. shall receive a G60 galvanized coating (minimum).

7.4.7 **Open-web Joists.** Open-web joists shall be anchored to steel supports by bolting or field welding. Provide steel embed plates in concrete or masonry work. Where top chords are extended, provide required section modulus of extensions on the drawings. Joist bridging shall be installed as required for lateral stability of the joists and, at a minimum, in compliance with the recommendations of the Steel Joist Institute. Open-web joists shall be prime painted.

7.4.8 **Braced Frames.** If braced frames are used as all or part of the main lateral force resisting system, the stability of the structural system shall not depend on any single member or connection. Redundancy shall be provided either by using multiple bays of tension only X-bracing members or by using bracing members that are capable of both tension and compression if bracing is placed in a single bay.

7.4.9 **Plant Certification.** The fabricating plant furnishing the structural steel shall be certified under the AISC Certification Program for Conventional Steel Buildings, Category BU. Documentation shall be provided to the Contracting Officer for review and approval.

7.4.10 **Erection Plan.** The erection plan shall be reviewed, stamped and sealed by a structural engineer licensed by the state of Delaware.

7.4.11 **Metal Deck:**

7.4.11.1 **Roof Deck.** Metal roof deck material shall be galvanized steel and have a minimum thickness of 22 gage. The metal roof deck shall be fastened to the structural framing members with adequate fasteners to resist all shear and wind uplift loads.

7.4.11.2 **Deck Properties.** Where metal decks are used, show required section modulus and moment of inertia on drawings.

7.4.12 **Wood.** Pressure-treated wood shall be used for all structural members, including at top of pier support framing and at pier bracing framing.

7.4.13 **Modular Construction.** Modular or fully off-site-built construction for all or part of this/these structures will be acceptable. Construction will need to be compliant with the US Department of Defense Unified Facilities Criteria (UFC's). Bidders shall include a description of the construction systems with their system.

7.5 **SPECIAL REQUIREMENTS.**

7.5.1 **Antiterrorism/Force Protection.** All designs and components of design shall conform to UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings and associated supplemental guidance and instructions listed in Part 2. The horizontal support of door, window and skylight glazing must be designed to resist static pressures corresponding to amplified connection design pressures listed in UFC 4-010-01 and its references, based upon the actual strength of the supplied window and door glazing. Refer to the Protective Design Center (PDC) at <https://pdc.usace.army.mil/> for further guidance and current interpretations or clarifications of these UFC's.

7.5.2 **Dynamic Analysis.** The Contractor may use a dynamic analysis program of their choice; however, one particular program (SBEDS) is frequently used. Accompanying the calculation submittal shall be a brief, but concise, narrative containing the name, version and description of the method of analysis for the dynamic program used. The Contractor may use the SBEDS program (free of charge, once registered) from the Protective Design Center website, <https://pdc.usace.army.mil/>. Registration is required. Dynamic analysis guidance is presented in PDC TR 10-02.

7.5.3 **Suspended Equipment.** Suspended equipment weighing 31 pounds or more shall be mounted and braced to resist applicable forces as described in Standard 19 - Equipment Bracing, paragraph 3-20 of UFC 4-010-01. This standard does not preclude the need to design equipment mountings for forces required by other criteria such as seismic standards.

PART 8

THERMAL DESIGN

8.1 THERMAL CHARACTERISTICS.

8.1.1 Building construction as a minimum shall conform to the requirements of the latest version of ASHRAE 90.1. The R and U values shall be calculated in accordance with ASHRAE methods for required insulation values.

8.2 THERMAL INSULATION AND VAPOR BARRIER.

8.2.1 A vapor barrier shall be provided on the warm-in-winter side of exterior wall and ceiling insulation, except in humid areas as defined below. Vapor barriers shall not be used under insulation installed on top of a ceiling at a ventilated attic. Vapor barriers shall be continuous and the connections at the roof/ceiling-to-wall and wall-to-foundation shall be carefully detailed.

8.3 HUMID AREA DESIGN.

8.3.1 Climates with a minimum of 3000 hours of 67 degree F or higher wet bulb temperature during the warmest six consecutive months, or with a minimum of 1500 hours or more of 73 degrees F or higher wet bulb temperature during the warmest six consecutive months, shall be considered humid areas. Other areas that do not meet the strict definition of a humid area but experience humid conditions on numerous occasions may also be considered by the designer as appropriate for humid area design. An effective infiltration barrier is critical to limiting moisture flow into occupied spaces. In humid areas, interior surfaces of ceilings and exterior walls shall be covered with materials which allow escape of water vapor from inside the walls into the conditioned space to prevent the growth of mold on interior surfaces. The vapor barrier in humid areas shall be located on the outside face of the exterior wall or ceiling insulation.

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PART 9

PLUMBING DESIGN

9.1 DESIGN CRITERIA.

9.1.1 Design and install the plumbing system (labor, material, permits, licenses, etc.). The plumbing system shall be designed, installed, and tested in accordance with all Applicable Criteria located in Part 2 to include UFC 3-420-01, Plumbing Systems.

9.1.2 System design and installation shall conform to the mandatory energy and water conservation criteria in the latest edition of ASHRAE Standard 189.1. All flush fixtures shall be "Water Sense" certified. Lavatory faucets shall deliver a maximum flow rate of 0.5 gallons per minute (gpm). Employ water conservation techniques that exceed LEED Baseline fixture flow requirements by 30% or more.

9.1.3 Water softening systems shall not be required.

9.1.4 Piping systems shall be identified per ANSI requirements. Equipment shall be identified with engraved and laminated plastic nameplates or black lamacoid sheets with white lettering. Valves shall be provided with tags and indexed to a master schedule.

9.1.5 Equipment and materials shall be as specified. Installation shall meet the requirements specified. All materials and equipment shall be the manufacturer's latest design.

9.1.6 The facility will require use of e-Mon d-Mon metering products. The government will provide specifications on the monitoring system requirements. Meters shall also be monitored through the Building Automation System (BAS).

9.1.7 The Contractor shall comply with minimum Antiterrorism/Force Protection Criteria in accordance with UFC 4-010-01 requirements.

9.1.8 Systems requiring seasonal drainage shall not be used, lawn irrigation is not required.

9.1.9 No roof-mounted plumbing equipment is permitted, except for sanitary vents, solar collectors and associated piping and appurtenances.

9.1.10 Equipment layout shall make provisions for manufacturer's recommended clearance and code requirements.

9.2 DESIGN NARRATIVE AND CALCULATIONS.

9.2.1 Provide a design narrative and calculations as indicated in the Army Reserve Design Process and Submittal Requirements.

9.2.2 Piping design shall be based on the Applicable Criteria for domestic water, sanitary waste and vent piping. All water piping shall be sized in accordance with methods outlined in the International Plumbing Code. An isometric diagram of the water system and of the sanitary sewer and vent system shall be included in the design submittal.

9.2.3 Hot water heater sizing shall be based on the methods described in the ASHRAE Application Handbook guidelines for the specific building occupancy and usage. The contractor shall evaluate condensing gas fired storage type water heater for heating potable water for the facility.

9.2.4 The contractor shall evaluate the use of solar hot water heating using LCCA as required by EPAct 2005. This system shall be incorporated if shown to be LCCA effective. A further analysis shall be performed by the contractor to evaluate the use of a gas fired instantaneous heaters sized for 3 SLQs. The most cost effective one or combination of the systems to be evaluated shall be incorporated into the facility design. Sizing of the solar water heating system shall be based on the potable water consumption of the facility plumbing systems.

9.3 PLUMBING FIXTURES AND EQUIPMENT.

9.3.1 High quality plumbing fixtures with fittings and trim as applicable shall be provided in each SLQ. Fixtures shall be water conservation type in accordance with the IPC. Insulate water and waste piping for accessible lavatories. Provide floor mounted flush valve elongated water closets with a closed front seat with cover and vitreous china countertop lavatories. Flush valves shall be manual piston operated equal to Sloan Crown Series. Provide enameled cast iron bathtub assemblies, 60" by 30", for handicap rooms, provide open fiberglass shower assembly with ADA compliant thresholds.

9.3.2 Frost proof wall hydrants shall be located at approximate 150-foot intervals on the building exterior. A boot wash station will be included. Each boot wash facility must include a minimum of two (2) freeze-proof hose bibbs, a drain, removable bar grating, mounted boot brushes and a drying rack/handrail.

9.3.3 There will be a mop sink located in the maintenance storage room. This will have domestic cold and hot water and drain connections.

9.3.4 Domestic Water Heating Systems.

9.3.4.1 High efficiency condensing gas storage type water heaters shall be provided for each floor located in the mechanical room. Other locations can be considered for energy savings or distribution issues, and these locations shall be reviewed during design. Domestic water heating is to be propane (natural gas later) gas-fired and water shall be stored at 140 degrees F. The building hot water supply temperature for the fixtures shall be 110 degrees F provided through a mixing valve assembly. The water heater sizes will be based on ASHRAE guidelines for the specific building occupancy and usage. Water heaters shall comply with the energy conservation requirements of ASHRAE Standard 90.1. Water heaters shall be provided with fully automatic controls with safety relief valves.

9.3.4.2 The domestic hot water system shall be sized to provide adequate hot water for all fixtures that require hot water, including lavatories, sinks, showers, etc.

9.3.4.3 The domestic water system shall be served by a recirculation system to provide hot water at remote fixtures continuously when the building is occupied. Provide scald protection at each fixture or group of fixtures.

9.3.5 **Vibration/Noise Isolation.**

9.3.5.1 Water hammer arrestors shall be used to minimize water system noise. All piping shall be anchored to prevent motion and resulting noise during operation.

9.4 **PIPING SYSTEMS.**

9.4.1 **Domestic Water Piping System.**

9.4.1.1 A separate domestic water service shall be brought into the mechanical rooms of each building. Isolation shutoff valves shall be provided. The buildings shall be metered with the meter located inside the mechanical room of each floor.

9.4.1.2 Provide a reduced pressure zone backflow preventer in each incoming domestic water service. Plumbing piping shall be sized to accommodate flush valve plumbing fixtures. Under slab supply piping shall be limited to the domestic water service entrance only.

9.4.1.3 The domestic water piping shall be extended to fixtures, outlets, and equipment. The domestic hot water and cold water piping shall be arranged and installed to permit draining. The supply piping to each piece of equipment or fixture, except faucets, flush valves, or other control valves which are supplied with integral stops, shall be equipped with an accessible shutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Supply piping to fixtures, faucets, hydrants, shower heads and flushing devices shall be anchored to prevent movement and shall include water hammer arrestors sized and installed per IPC. Insulate all domestic cold water, domestic hot water and recirculating water systems.

9.4.1.4 Provide a line sized isolation valve at each branch connection. Locate the valve as close as possible to the branch takeoff.

9.4.1.5 Access panels/doors shall be provided for valves and appurtenances of the plumbing system located behind hard walls or ceilings.

9.4.2 **Sanitary Drain, Waste, and Vent Piping Systems.**

9.4.2.1 See Part 3 of this section for site utility requirements. Piping system runs within the building are to be kept as short as possible. Metallic vent piping shall be used through the roof from at least 6 inches below the roof to the required point of termination above the roof.

9.4.2.2 All lavatory and sink drains and P-traps shall be coordinated with millwork to isolate drains. The building sanitary sewer shall be designed in accordance with the International Plumbing Code. Coordinate location of floor drains for floor sloping requirements. Provision shall be made to collect condensate from the condensate drains and drain to the storm water system. Provide floor drains in mechanical rooms near each water heater. Also provide floor drains within individual toilet rooms. All floor drains must be automatically primed by single trap primers.

9.4.2.3 Each laundry must include one solid polymer utility sink with gooseneck faucet and a floor drain. Water and sanitary lines will be provided.

9.4.3 **Propane (Natural) Gas Piping System.**

9.4.3.1 Design, furnish, and install propane natural gas piping from new owner leased, contractor installed propane tank to the gas-fired equipment. Provide complete design and layout of piping system coordinated with new utilities. The complete gas piping installation shall conform in all respects to NFPA 54, NFPA 58 and State of Delaware codes.

9.4.3.2 Gas piping shall be sized for a minimum pressure of 2 psig at inlet to the buildings. Gas piping shall be sized in accordance with the Applicable Criteria. Design building gas piping distribution system based on a 2 psig pressure downstream of the gas meter and pressure regulator.

9.4.3.3 Below ground exterior gas piping shall be polyethylene with marker tape. Steel to polyethylene transition fittings shall be used with steel valves. Provide distribution system shutoff valves. Contractor to verify final locations of distribution system shutoff valves with Contracting Officer.

9.4.3.4 A gas meter and pressure regulator shall be provided at the outside wall of the building. The gas meter shall have a maximum pressure drop across the meter of 1/2" W.C. See Part 3 of this section for site utilities and advanced meter requirements.

9.4.3.5 The gas pressure regulator shall be sized to reduce the gas pressure from that in the service line to 2 psig. Gas risers outside of the building shall be anodeless and have a full coating protection using coal tar epoxy and wrapped up to 6 inches above grade.

9.4.3.6 The gas piping from the gas meter to the equipment shall be black steel with fittings of malleable iron. Piping connections to all gas burning equipment shall be made with rigid pipe and fittings. All gas risers shall be anodeless.

9.4.3.7 A ball type gas shutoff valve and coupling shall be provided in an easily accessible place in the gas line to each gas-fired equipment item.

9.4.3.8 A gas pressure regulator shall be provided for each piece of gas-fired equipment to reduce the gas pressure from 2 psig to the pressure required by the gas fired equipment. Vents shall be piped to the outside of the building.

PART 10

ELECTRICAL DESIGN

10.1 DESIGN CRITERIA.

10.1.1 The electrical system shall be designed in compliance with Applicable Criteria located in Part 2 of this section.

10.1.2 **Seismic Protection.** Provide seismic protection for electrical equipment and electrical systems as required for the project seismic zone in accordance with applicable local code and in accordance with UFC 3-310-03A and the IBC.

10.2 DESIGN CALCULATIONS. Provide calculations for the following:

10.2.1 **Interior Lighting.** Provide calculations for each room or area.

10.2.2 **Exterior Lighting.** Provide calculations for all site lighting to include parking areas, walkways, roadways, and security. Exterior lighting shall be designed in accordance with UFC 3-530-01.

10.2.3 **Load Analysis.** Provide load analysis for the building to include connected and estimated demand. Separate loads by categories such as lighting, receptacles, HVAC, special equipment, etc. Provide at least 25% spare spaces and capacity for electrical equipment.

10.2.4 **Fault Analysis.** Provide short circuit calculations for electrical system(s).

10.2.5 **Voltage Drop.** Provide calculations to verify voltage drops. Do not exceed limits as given in the National Electrical Code (NEC) and UFC 3-501-01, whichever is more stringent.

10.2.6 **Coordination.** Provide data to verify proper overcurrent protection and selective overcurrent protection coordination is provided for the equipment system(s).

10.2.7 **Lightning Protection.** A lightning protection system shall be provided if the new facilities are located in an area with a high lightning probability. The engineer of record shall perform a lightning risk assessment in accordance with NFPA 780, Annex L.

10.3 INTERIOR POWER.

10.3.1 The electrical power distribution system shall be designed to meet all requirements of UFC 3-520-01 and NEC (NFPA 70).

10.3.2 Motel Concept (MC)

10.3.2.1 A new 208/120V 3-phase, 4 wire electrical service will be provided to this new MC BBT Barracks facility through a new service transformer located adjacent to the

building. 12KV utility power is available in the facility. The transformer pad, secondary conduit and conductors, meter, and current transformers shall be provided. The transformer, primary service and meter are typically furnished by the utility, however, coordinate with the utility and provide all equipment and connections not furnished by the utility.

10.3.2.2 Village Concept

10.3.2.2.1 A new 120/208V 3-phase, 4 wire electrical service will be provided to this new VC BBT Barracks facility through a new service transformer located adjacent to the town center. 12KV utility power is available in the facility. The transformer pad, secondary conduit and conductors, meter, and current transformers shall be provided. A 120/208V Nema 4X Distribution panel will be installed in the rear of the ADA lodge. The transformer, primary service and meter are typically furnished by the utility, however, coordinate with the utility and provide all equipment and connections not furnished by the utility.

10.3.3 Motel Concept (MC)

10.3.3.1 A new 208/120V service entrance switchboard and all necessary sub-distribution panels in the building shall be provided. Load demand will be performed and panel shall be rated to power to all equipment in the building. Panel will include 15% spare capacity.

10.3.4 Village Concept

10.3.4.1 Each House shall have a new 208/120V service entrance panel. Load demand will be performed and panel shall be rated to power to all equipment in the building. Panel will include 15% spare capacity.

10.3.5 Grounding of the facility shall be provided for each building in accordance with the NEC and applicable UFC's.

10.3.6 A Transient Voltage Surge Suppression System will be provided as a parallel path to ground to limit the magnitude of surge current on the system. TVSS will be wired to the new Service Distribution Panel through a breaker.

10.3.7 The electrical wiring system shall consist of conduit and wire. Conductors shall be copper, and the smallest conduit shall be ¾". All electrical wiring shall be concealed where possible. All branch circuits serving computer equipment or other switch mode power supplies shall have neutral conductors sized at 100 percent of the phase conductors.

10.3.8 New receptacles and equipment connections, as required for building equipment and by UFC standards, shall be provided. Electrical receptacles shall be provided in accordance with the tables provided in the facility-type design guide DG 415-2. In addition provide a minimum of one general purpose 120 volt, 20 ampere duplex receptacle in each room. In rooms where walls exceed 30 feet, provide an additional duplex receptacle for each additional 10 feet of wall or fraction thereof. Receptacle

spacing shall not exceed 10 feet. Receptacles will be provided next to all CATV and Data Jack Locations.

10.3.9 Provide a 120 volt, 20 amp duplex receptacle and data outlet adjacent to each network printer.

10.4 INTERIOR LIGHTING

10.4.1 The lighting system design shall economically provide lighting levels for normal living conditions and effective nighttime vision for security and safety. The lighting system shall be designed in accordance with UFC 3-530-01, IES The Lighting Handbook, 10th Edition and NFPA 70 National Electrical Code. LED lighting shall be used to the maximum extent and in addition meet the requirements for life cycle cost analysis.

10.4.2 **Efficiency.** Interior lighting shall be both efficient and color corrected, Color Rendering Index (CRI) of 80 or better and a standard lighting color of 3500 K required. Minimum efficacy standards for lighting shall be as follows:

10.4.3 LED: 100 lumens/watt.

10.4.4 Batteries for emergency lighting fixtures and battery LED drivers shall have a minimum warranty of five years and a minimum expected battery life of 10 years. Battery fluorescent ballast shall provide a minimum of 1100 lumens continuously for 90 minutes.

10.5 EXTERIOR LIGHTING

10.5.1 The exterior lights shall economically provide lighting levels for effective nighttime vision for security and safety, on the ground based exterior sidewalks adjacent to the building and at all raised walkways, decks, stairs and ramps that access the building's entrances and access door. The lights shall be designed in accordance with UFC 3-530-01, IES The Lighting Handbook, 10th Edition and NFPA 70 National Electrical Code. LED lighting shall be used to the maximum extent and in addition meet the requirements for life cycle cost analysis.

10.5.2 Sidewalks that provide access to the building(s) from the associated parking lots shall be lit with bollard lights.

10.5.3 Provide weather resistant exterior wall mounted light fixtures to illuminate the on grade and raised walkways that provide direct access the unit/building entrances.

10.5.4 All exterior lights shall be controlled by Photocell sensors.

10.6 TELECOMMUNICATIONS.

10.6.1 Furnish and install new Multimode Fiber line from the existing IDF located at the laundry facility (building 162) across the street to new IT room layer 2 switch. Install new fiber line in duct bank.

10.6.2 MC Concept

10.6.2.1 The Contractor shall design, furnish, and install all conduit, wiring, outlets, jacks, and associated equipment within the BBT Barracks facility. Provide backboards, equipment racks, 110 type punch down blocks, 110 type patch panels, conduit, and cable tray system. Size pathway system, racks and equipment for complete utilization of the service entrance cables and all telephone and data outlets, plus room for at least 50% growth. Provide a minimum of two (2) 19 inch x 84 inch, fully enclosed, lockable, equipment rack cabinets.

10.6.3 VC Concept

10.6.3.1 The Contractor shall design, furnish, and install all conduit, wiring, outlets, jacks, and associated equipment within the BBT Barracks facility. Provide backboards, equipment racks, 110 type punch down blocks, 110 type patch panels and conduit. Size pathway system, racks and equipment for complete utilization of the service entrance cables and all telephone and data outlets, plus room for at least 25% growth. Provide a minimum of two (1) 19 inch x 48 inch, fully enclosed, lockable, equipment rack cabinets.

10.6.4 Communications – Data Cabling System.

10.6.5 Provide a Category 6a data cabling system in accordance with the Army Reserve IT Manual.

10.6.6 Provide 8-pin, RJ-45 type, Category 6, data outlets as required by DG 415-2.

10.6.7 The Government will provide Local Area Network and Wide Area Network system design, hardware, software, and interconnections to complete an operational system.

10.6.8 **CATV** – Provide CATV outlets, with 120 volt duplex receptacle mounted adjacent, in each sleeping quarters and lounge, .

10.7 ELECTRONIC SAFETY AND SECURITY

10.7.1 Intrusion Detection System (IDS) – Provide infrastructure, including conduit, boxes and wire for a government provided intrusion detection system. Provide connectivity to the main telephone equipment room and the General Supervisor's Office. Coordinate rough in requirements with the user.

10.7.2 Entry Control System (ECS) – Provide infrastructure, including conduit, boxes and wire for a government provided entry control system to include for all exterior building entry doors, Interior room doors, IT/Telecom spaces and mechanical/electrical spaces. Provide connectivity to the main IT room. Coordinate rough in requirements with the user.

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PART 11

HVAC DESIGN

11.1 DESIGN CRITERIA.

11.1.1 Design and install the HVAC systems (labor, material, permits, licenses, etc.). The HVAC systems shall be designed, installed, and tested in accordance with all Applicable Criteria located in Part 2.

11.1.2 HVAC control schemes and sequences shall as a minimum meet the requirements of ASHRAE Standard 90.1, Energy Standard for Buildings – Except Low-Rise Residential Buildings. Provide system enhancements beyond the minimum requirements of ASHRAE Standard 90.1 as required to meet energy conservation requirements in Section 01 02 00.0048 Part 12 - Energy Conservation.

11.1.3 The Contractor is responsible for obtaining any available rebates from the utility and crediting those rebates to the Government in the bid.

11.1.4 Piping systems shall be identified per ANSI requirements. Equipment shall be identified with engraved and laminated plastic nameplates or black lamicaid sheets with white lettering. VAV units or similar units are to be labeled at their underside to allow identification after installation. Valves shall be provided with tags and indexed to a master schedule.

11.1.5 Heating installations using fuel gas burning systems shall include venting suitable for condensing flue gases required by the application. All heating equipment shall utilize sealed combustion, direct vented, condensing burners where practical.

11.1.6 The design of HVAC systems with respect to noise and vibration control shall be in accordance with ASHRAE HVAC Applications.

11.1.7 Exhaust vents for all buildings shall have low leakage dampers and be located at least 30 feet from outdoor air intakes in accordance with UFC 3-410-01 requirements to prevent short-circuiting of exhaust air.

11.1.8 All materials and equipment shall be the standard cataloged product of manufacturers regularly engaged in production of such materials and equipment and shall be the manufacturer's latest standard design.

11.1.9 The Contractor shall comply with minimum Antiterrorism/Force Protection criteria in accordance with UFC 4-010-01 requirements to include locating outdoor air intakes at least 10 feet above grade with low leakage dampers. Contracting Officer will designate the locations of the emergency air distribution shut-off switches.

11.1.10 Roof-mounted make-up air and exhaust equipment is permitted in areas noted on the drawings. These areas shall be coordinated with the architectural layout to

provide visual separation when viewed from the public street area to the front of the building.

11.1.11 Equipment layout shall make provisions for manufacturer's recommended clearance and code requirements.

11.1.12 Select mechanical equipment utilizing replacement HFC-type refrigerants. Equipment utilizing CFC-type, HCFC-22 and other HCFC-type refrigerants shall not be permitted.

11.1.13 The HVAC systems listed in this part have proven in the past to provide reasonable efficiency (i.e. meet EPCACT 2005) when coupled with minor envelope improvements. To meet increasing energy goals these systems may need to be enhanced (energy recovery, demand controlled ventilation, economizers, more envelope improvements) or substituted with systems such as ground source heat pumps, VRF systems. However, the general zoning capability of the systems listed in this part shall be maintained if a substitute system is proposed. Section 01 0200.0048 Part 12 - Energy Conservation further details the energy requirements of this this project.

11.2 DESIGN CALCULATIONS.

11.2.1 **Load Calculations.** Provide a design narrative and calculations as indicated in the Army Reserve Design Process and Submittal Requirements. Heat gain and loss calculations shall be, at a minimum, in accordance with the current edition of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals and the latest edition of the ASHRAE Cooling and Heating Load Calculation Manual. The load calculations shall be in accordance with ASHRAE Non-residential Cooling and Heating Load Calculations. Calculations shall be performed on a room-by-room basis. Heating load calculations shall not consider lights or internal loads as supplementing the heating system. Clearly describe the features of the systems being used. Demonstrate compliance with ASHRAE 90.1 by completing the proper compliance forms available from ASHRAE. Note that the envelope requirements of ASHRAE 90.1 form the basis for modeling the building. The building envelope for this facility shall meet or exceed the requirements as updated in ASHRAE 189.1 which exceed the requirements of ASHRAE 90.1. Summarize the outdoor and indoor design conditions used. State the design objectives and design assumptions to provide a comfortable building environment within ASHRAE 55 requirements. Outline design decisions made that affect the operation and maintenance of the systems. Provide all calculations used to support equipment selections, including but not limited to items such as; hydronic piping analysis, duct design analysis for air handler selection, air separator selection, utility service piping selection, boiler and chiller loads, etc. Calculations shall be checked for accuracy and initialed or signed by the design professional. The method of zoning the building spaces used for computerized building load calculation input shall be clearly shown as part of the calculations.

11.2.2 The cooling coil load shall be calculated at the cooling outside design condition and the 0.4% Dew Point / Mean Coincident Dry bulb condition

(Dehumidification). The equipment shall be designed for the greater of the two cooling loads.

11.2.3 **Outside Design Conditions.** Obtain outside design conditions for cooling and heating from the ASHRAE Handbook – Fundamentals. The 1% dry bulb temperature with mean coincident wet bulb temperature shall be used for the cooling outside design condition. The 0.4% dew point temperature with the mean coincident dry bulb temperature shall be used for the high wet bulb cooling outside design condition. The 99% dry bulb temperature shall be used for the heating outside design condition.

11.2.4 **Heating and Cooling – Design Conditions:** Refer to Transient Training Officers Quarters Standard Design from the Department of the Army Facilities Standardization Program Design Guide for Specific Space Criteria.

11.2.5 **Occupancy Loads:** The sensible and latent loads for the occupied spaces shall be in accordance with the ASHRAE Handbook – Fundamentals. The number of people shall be determined by using UFC 4-171-05, DG 415-2 and ASHRAE recommendations.

11.2.6 **Lighting Load:** Fixture count and heat release data shall be used to calculate the lighting loads in each space.

11.2.7 **Equipment Loads:** A 1.5 watt per square foot allowance shall be included the spaces. A 200 watt allowance shall be included for each computer workstation.

11.2.8 A direct digital control (DDC) automatic temperature control system shall be provided to control and monitor all HVAC and plumbing systems. The system shall monitor energy usage through electric, water and gas meters. The DDC system shall provide remote monitoring and alarm notification via direct connection to the DEARNG Central BAS system. The system shall meet BacNet protocol requirements.

11.3 HVAC SYSTEMS

11.3.1 MC concept--The individual rooms heating and cooling shall be provided through single zone water source heat pumps. Contractor shall locate the required pumping systems and boilers within the mechanical room. Location of the closed loop evaporative condenser shall be located outside on a concrete pad. Ventilation for units to be supplied through outside air connection using DOAS with a total energy recovery unit (ERV) to the space.

11.3.2 VC concept-- The individual rooms heating and cooling shall be provided through single zone VRF unit. Contractor shall locate the required piping systems and outdoor unit outside on a concrete pad. Ventilation for units to be supplied through outside air connection using DOAS with a total energy recovery unit (ERV) to the space.

11.3.3 Bathrooms shall not be directly cooled. Air shall be transferred from the adjacent rooms into these areas. Exhaust air shall be through the building energy recovery system (LCCA).

11.3.4 IT rooms shall be individually heated and cooled using a split system specially designed for that purpose. The outdoor unit shall be located on the ground on a concrete pad.

11.3.5 **Exhaust Systems.**

11.3.5.1 Each fan and drop shall be sized to exhaust 75 CFM. Makeup air shall be provided by the DOAS air units.

11.3.5.2 A DDC control system shall be provided to control all HVAC systems. The DDC system shall also include and shall monitor energy usage through the electric, water and gas meters.

11.3.5.3 The system installed with this project shall be fully integrated into the existing DDC incorporating all requirements of UFC 3-410-01 BacNet Direct Digital Control for HVAC and Other Local Building Systems, with Change 1.

11.4 **DUCTWORK, PIPING AND ACCESSORIES.**

11.4.1 **Duct System Design.**

11.4.1.1 The ductwork shall be sized using industry standard friction rates and velocities. Duct locations shall be coordinated with all disciplines. Insulate ductwork as required by ASHRAE 90.1. Provide volume control dampers at supply and return branch duct work take-off locations. Balancing shall not be performed at the grilles, registers and diffusers.

11.4.1.2 Flexible duct shall be insulated metallic and shall be limited to 5'-0" spans with no elbows allowed.

11.4.1.3 Provide duct access panels before and after all duct-mounted equipment.

11.4.2 **Fire Dampers and Smoke Dampers.**

11.4.2.1 Fire dampers and smoke dampers shall be fire rated according to the areas being protected. Fire dampers and smoke dampers shall be dynamically rated.

11.4.3 **Hydronic and Refrigerant Piping.**

11.4.3.1 Hydronic piping shall be designed to be efficient, easily hydraulically balanced, and accessible. Pipe size to be within ASHRAE standards. Riser piping located in interior partitions or exterior walls is prohibited. Insulate hydronic and refrigerant piping systems.

11.4.4 Access Panels.

11.4.4.1 Access panels/doors shall be provided for valves and appurtenances of the HVAC system located behind hard walls or ceilings.

11.4.5 Diffusers, Grilles and Registers.

11.4.5.1 Air distribution devices shall be factory-fabricated of corrosion-resistant steel, or aluminum and shall distribute the specified quantity of air evenly over space intended without causing noticeable drafts.

11.5 TESTING, ADJUSTING, AND BALANCING

11.5.1 Testing, adjusting, and balancing shall be provided for HVAC ductwork systems and hydronic heating and cooling systems. Air balancing shall not begin until after building envelope sealing and testing is completed. See the Technical Outline Specifications for additional requirements.

11.6 COMMISSIONING

11.6.1 A commissioning agent is being provided by the DEARNG to perform LEED fundamental and enhanced commissioning. Contractor shall be responsible for supporting the commissioning efforts.

11.7 BUILDING OCCUPANCY FOR ENERGY CALCULATIONS

11.7.1 For bidding purposes the following occupancy shall be used, 90% occupied 24 hours per day. Actual occupancy rates shall be determined during design with coordination with the Users.

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PART 12

ENERGY CONSERVATION

12.1 ENERGY CONSERVATION STRATEGIES.

12.1.1 Design criteria for alternative energy conservation strategies shall be in accordance with Applicable Criteria identified in Part 2.

12.1.2 Design the buildings, including the building envelope, HVAC systems, water heating, power, and lighting systems to achieve an energy consumption that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ASHRAE Standard 90.1 to comply with the Energy Policy Act of 2005 (EPAct 2005).

12.1.3 Examples of life cycle cost effective integrated strategies for energy savings within various climate zones can be found in the ASHRAE publication "Advanced Energy Design Guide" publication includes specific recommendations for envelope components, lighting design and controls, HVAC design and controls, and water heating equipment. The recommendations provide a way, but not the only way, to achieve the desired energy savings.

12.1.4 The Contractor shall purchase Energy Star or Federal Energy Management Program (FEMP) designated products. In the case of an electric motor of 1 to 500 horsepower the Contractor shall select only a premium efficient motor.

12.1.5 If an alternative energy generation method is proposed for use as the project's primary energy source, documentation shall be submitted verifying the system's reliability and the ability to meet the project's peak demand.

12.1.6 The following paragraphs identify additional energy conservation strategies and techniques to consider. The listing is not all inclusive, and the techniques suggested may not be cost-effective for the project.

12.1.6.1 Geothermal heating and cooling systems. Contractor to design as required for site land use, soil and ground water conditions, and ground heat rejection characteristics. Geothermal system shall be sized so that each u-tube is equal to 1-1.5 tons.

12.1.6.2 HVAC system air-to-air heat recovery. Contractor shall include a total energy recovery unit (ERV) for recovery of building exhaust system energy and a geothermal heating cooling system for pre-heating and pre-cooling of HVAC system outdoor air in typical conditioned areas.

12.1.6.3 Glazing and shading of building windows. The contractor shall evaluate the building window systems to optimize the characteristics using LCCA and provide the most cost effective solution.

12.1.6.4 Photovoltaic energy systems, including PV POV lighting. The contractor shall include PV systems.

12.1.6.5 Economizer. Provide air economizer system as required by ASHRAE 90.1 if allowed by UFC 3-410-01.

12.1.6.6 Solar domestic water pre-heating systems. This system shall be required to supply a minimum of 30% of the domestic hot water heating system requirements for the facility unless shown to not be cost effective by LCCA.

PART 13

FIRE PROTECTION

13.1 FIRE PROTECTION ENGINEER

13.1.1 The contractor shall provide the services of a qualified registered fire protection engineer (QFPE). A qualified registered fire protection engineer shall be a registered professional engineer (P.E.) who has passed the fire protection engineering written examination administered by the National Council of Examiners for Engineering and Surveying (NCEES) and has relevant fire protection engineering experience that can be verified with documentation. The fire protection engineer shall be an integral part of the design team and shall be involved in every aspect of the design, construction and testing/commissioning as it relates to fire protection and life safety. This includes, but is not limited to, building code analysis, life safety code analysis, design of automatic fire alarm, detection, and suppression systems, water supply analysis, a multi-discipline review of the entire project, construction inspections and witnessing of fire protection acceptance testing/commissioning.

13.2 DESIGN CRITERIA.

13.2.1 Fire Protection & Life Safety Code Review

13.2.1.1 The QFPE and architectural Designer of Record shall perform and coordinate a fire protection and life safety code review for the project in accordance with UFC 3-600-01. Building code requirements such as construction type, height and area requirements, occupancy classification, etc., shall be in accordance with the IBC. Life safety code requirements such as occupant load, means of egress, interior finish requirements, etc., shall be in accordance with NFPA 101.

13.2.1.2 The code review shall be submitted with each design submittal on a drawing sheet and in the design analysis. The code review shall include requirements for work in new facilities; type of construction; height and area limitations; classification of occupancy; building separation or exposure protection; specific compliance with NFPA codes and the IBC; requirements for fire-rated walls, doors, fire dampers, etc.; interior finish ratings; analysis of automatic suppression systems and protected areas; water supplies; fire alarm/ mass notification system, including connection to the base-wide system; fire detection system; fire extinguishers; and other pertinent fire protection data.

13.2.1.3 Provide life safety floor plans indicating egress travel distances, occupancy hazard areas, rating and locations of fire-resistive assemblies, fire extinguisher locations, exit sign locations, emergency light locations, and other data necessary to exhibit compliance with life safety code requirements.

13.2.1.4 Two acceptable planning concepts have been developed for the Bridging documents. For identification reference clarity, these two concepts are titled as follows: "The Motel Concept" or "MC" and "The Village Concept" or "VC". Please refer to Part 6 of this document titled "Architectural and Interior Design" for details on each concept.

13.2.2 Fire Suppression System

13.2.2.1 A fire hydrant flow test was conducted on April 20, 2022, by Sussex Shores Water Company on the fire hydrant located near the South Gate of the Delaware Army National Guard Camp. The results of the flow test were as follows: 68 psi static pressure, 49 psi residual pressure while flowing 1,000 gpm. The flow test shall be used by the Offerer to bid the fire suppression system. The contractor shall obtain a new hydrant flow test in accordance with NFPA 291 for use as the basis of their design calculations. The hydrant flow test shall be witnessed by the contractor's fire protection engineer.

13.2.2.2 A wet pipe sprinkler system shall be provided throughout. The sprinkler system shall be designed and installed in accordance with UFC 3-600-01 and NFPA 13.

13.2.2.3 (MC only) The sprinkler system shall be supplied by a new fire water service line. The sprinkler riser shall be located in a dedicated room that is directly accessible from the exterior. Provide a post-indicator valve on the incoming fire main in accordance with NFPA 24. A double check backflow preventer and associated test header shall be provided within the riser room. A fire department connection (FDC) shall be provided within 150 feet of a fire hydrant. Provide a Floor Control Valve Assembly (FCVA) equipped with a shutoff valve, test/drain valve, flow switch, and tamper switch for each floor of the facility.

13.2.2.4 (VC only) The sprinkler system for each group of two buildings shall be supplied by a single fire water service line and single sprinkler riser. The single sprinkler riser shall be located in a dedicated room that is directly accessible from the exterior. Provide a post-indicator valve on the incoming fire main in accordance with NFPA 24. A double check backflow preventer and associated test header shall be provided within the riser room. A fire department connection (FDC) shall be provided within 150 feet of a fire hydrant. Provide a Zone Control Valve Assembly (ZCVA) equipped with a shutoff valve, test/drain valve, flow switch, and tamper switch for each building.

13.2.2.5 Design density, design area, and exterior hose stream demand for the sprinkler system shall be in accordance with UFC 3-600-01. The design area reductions in NFPA 13 for quick-response sprinklers are not permitted. Provide hydraulic calculations in the Design Analysis to support the design of the system. All calculations shall include a minimum 10 percent or 5 psi (whichever is larger) safety factor on the system pressure.

13.2.2.6 All aboveground sprinkler piping 2-inches and less in diameter shall be minimum Schedule 40 black steel pipe. All aboveground sprinkler piping larger than 2-inches in diameter shall be minimum Schedule 10 black steel pipe.

13.2.2.7 The anticipated Seismic Design Category for the facility is B and shall be confirmed by the final geotechnical report. Seismic restraint is not required for Seismic Design Category A or B facilities in accordance with UFC 3-600-01.

13.2.2.8 All sprinklers located in finished areas with ceilings shall be recessed or concealed pendant type. Sprinklers located in unfinished rooms with no ceilings shall be upright type. Provide dry heads in areas subject to freezing. Extended coverage sprinklers are not allowed. Minimum sprinkler k-factor shall be in accordance with

UFC 3-600-01. The use of flexible sprinkler hose with fittings intended for direct connection to sprinklers must be approved by the AHJ.

13.2.2.9 An electric driven fire pump and controllers, if necessary to meet the sprinkler system hydraulic demand, shall be provided in accordance with UFC 3-600-01 and NFPA 20.

13.2.2.10 A range top extinguishing system is not required for cooking equipment provided with residential appliances in fully sprinklered Facilities.

13.2.2.11 Prepare and submit sprinkler working (shop) drawings, hydraulic calculations, and product data in accordance with NFPA 13. All submittals must be prepared by or prepared under the immediate supervision of the QFPE.

13.2.2.12 Provide acceptance testing. Provide preliminary testing as required for a complete system and submit the Certificate of Completion, in accordance with NFPA 13. Provide final testing to complete and submit the Inspection and Testing Forms, in accordance with NFPA 13.

13.2.3 Fire Alarm and Mass Notification System

13.2.3.1 An addressable combined Fire Alarm and Mass Notification System (FA/MNS) shall be provided for the facility. The FA/MNS shall be designed and installed in accordance with UFC 3-600-01, UFC 4-010-06, UFC 4-021-01, and NFPA 72.

13.2.3.2 (MC only) Provide a new Fire Alarm/Mass Notification Control Panel (FMCP) with full control, alarm, supervisory, trouble, signal, display, and battery backup features.

13.2.3.3 (VC only) Provide a new Fire Alarm/Mass Notification Control Panel (FMCP) with full control, alarm, supervisory, trouble, signal, display, and battery backup features for each group of two buildings.

13.2.3.4 Provide power to the FMCP from a locking circuit breaker that is painted or integrally colored red and is clearly marked "FIRE ALARM CONTROL PANEL." The system circuits shall be Class B and provided in conduit. Provide battery backup for the FA/MNS under supervisory conditions for 48 hours and all alarm devices for an additional 15 minutes. Remote signaling devices shall include a telephone auto dialer with two dedicated phone lines to communicate with a central station monitoring service. The Government is responsible for contracting for central station monitoring service. Coordinate with the Government's selected vendor and assist the Government with establishing service.

13.2.3.5 Provide addressable alarm initiating devices including double action manual pull stations at all building exits. Break-glass type pull stations are prohibited, including break-glass rod types.

13.2.3.6 Provide a photoelectric smoke detector with a low frequency sounder base in each sleeping room and the shared/common space of a residential suite. Primary and secondary power for the smoke detectors must be provided from the fire alarm control panel. Detectors that are not powered from the fire alarm control panel are not permitted.

Provide a photoelectric smoke detector above the FMCP and above any remote power supplied in accordance with NFPA 72.

13.2.3.7 Provide photoelectric duct smoke detectors in all HVAC main supply ducts when the system is greater than 2,000 CFM in accordance with NFPA 90A. Provide duct smoke detectors to control fire/smoke dampers as required.

13.2.3.8 Provide carbon monoxide detection where combustible fuel burning equipment is provided in accordance with UFC 3-600-01. Carbon monoxide detection must be located in each room or space where the fuel burning appliance(s) are located. Where HVAC equipment utilizes fuel burning equipment, one detector must be located downstream of the fuel burning equipment.

13.2.3.9 Tamper and flow switches shall be provided for the new fire sprinkler system. Provide a weatherproof fire alarm bell above the FDC that shall be activated through the FMCP upon the detection of water flow in the sprinkler system.

13.2.3.10 The notification appliance network consists of speakers, strobes, and visual text signs. Provide audible notification appliances (speakers) throughout the facility, including each sleeping unit, in accordance with NFPA 72. Provide weatherproof speakers on the exterior of the building at each exit in accordance with UFC 4-021-01. Visual notification appliances shall be provided in all normally occupied, public, and common use areas, unoccupied areas greater than 900 square feet in area, and in unoccupied areas where the ambient noise is loud enough to require hearing protection. Visual notification appliances shall conform to the applicable requirements of UL 1971, the Americans with Disabilities Act – Accessibility Guidelines (ADA-AG), NFPA 72, and UFC 4-021-01. The visual notification appliances shall be clear strobes marked “ALERT” for fire alarm and mass notification. The use of “FIRE” is not permitted. Provide text signs over each egress stairwell and over the substantial means of egress from the level of discharge (MC only). Exterior exit doors from a single room do not require a text sign.

13.2.3.11 Prepare and submit FA/MNS working (shop) drawings, battery and voltage drop calculations, and product data in accordance with NFPA 72. All submittals must be prepared by or prepared under the immediate supervision of the QFPE.

13.2.3.12 Provide acceptance testing. Provide preliminary testing as required for a complete system and submit the Certificate of Completion, in accordance with NFPA 72. Provide final testing to complete and submit the Inspection and Testing Forms, in accordance with NFPA 72.

13.3 Codes, Standards and Regulations

The contractor shall use the latest code versions at the time of issuance of the RFP.

UFC 1-200-01, DoD Building Code
UFC 3-600-01, Fire Protection Engineering for Facilities
UFC 4-010-06, Cybersecurity of Facility-Related Systems
UFC 4-021-01, Design and O&M: Mass Notification Systems
UFGS, Unified Facilities Guide Specifications
International Building Code (IBC)
NFPA 1, Fire Code

NFPA 13, Standard for the Installation of Sprinkler Systems
NFPA 24, Standard for the Installation of Private Fire Service Mains and Their
Appurtenances
NFPA 70, National Electric Code
NFPA 72, National Fire Alarm and Signaling Code
NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems
NFPA 101, Life Safety Code
NFPA 291, Recommended Practice for Water Flow Testing and Marking of Hydrants

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PART 14

SUSTAINABLE DESIGN

14.1 **SUSTAINABLE DESIGN GOALS.** The goals for improving the sustainability of facilities include:

14.1.1 LEED Silver rating is required for this project. The contractor shall be responsible for all review fees associated with LEED certification.

14.1.2 The contractor shall provide a plaque from USGBC identifying the facility as LEED certified by USGBC.

14.1.3 Using resources efficiently and minimizing raw material resource consumption, including energy, water, land and materials, both during the construction process and throughout the life of the facility.

14.1.4 Maximizing resource reuse, while maintaining financial stewardship.

14.1.5 Moving away from fossil fuels, and toward renewable energy sources.

14.1.6 Creating a healthy and productive work environment for all who use the facility.

14.1.7 Building facilities of long-term value.

14.1.8 Protecting and, where appropriate, restoring the natural environment.

14.2 **SUSTAINABLE DESIGN MEASURES.** Refer also to requirements in Section 01 33 29 Sustainability reporting. Sustainable design techniques shall be considered as they relate to site and building design, construction, operation and deconstruction. Techniques that conserve energy, improve functionality, and can be justified by life cycle cost analysis as cost-effective are encouraged.

14.2.1 This project shall comply with UFC 1-200-02 High Performance and Sustainable Building Requirements.

14.2.2 Sustainable Sites Credit Alternative transportation - low-emitting and fuel-efficient vehicles. The use of preferred parking is allowable. Contractor needs to provide required signage as part of the design/construction for the project.

14.2.3 Indoor Environmental Quality Credit Thermal Comfort - Verification: The DEARNG will complete a survey associated with this credit. Providing the survey to be filled out is the responsibility of the contractor.

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PART 15

ADDITIONAL REQUIREMENTS

15.1 **BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT.**

Design and construct the building envelope with a continuous air barrier to control air leakage into, or out of, the conditioned space. On the design drawings, clearly identify all air barrier components of each envelope assembly and detail the joints and interconnections between the air barrier components, and detail the penetrations of the air barrier components. On the design drawings, clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness. The designer may omit mechanical rooms which have louvered openings, flues, and vents from the zones to be tested. The designer may also omit shafts which are open to the mechanical room from the zones to be tested. An air barrier between the mechanical room and the remainder of the building is then required, as is an air barrier between the shaft and the remainder of the building.

15.1.1 Provide a continuous plane of air-tightness throughout the building envelope and make flexible and seal all moving joints. Window and door assemblies are components of the air barrier system and shall be connected and sealed to adjacent air barrier membranes. The allowable leakage rates of windows, exterior doors, curtain wall assemblies, skylights, and other such components must be identified in the associated specification sections for these components. Join and seal the air barrier material of each assembly in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of these assemblies and components.

15.1.2 The air barrier materials shall have an air permeance not to exceed 0.004 cfm / sf at 0.3" wg when tested in accordance with ASTM E 2178.

15.1.3 The air barrier shall be sufficiently durable to last the anticipated service life of the assembly.

15.1.4 Provide a design and installation that supports the air barrier so as to withstand the maximum positive and negative air pressure to be placed on the building without displacement, or damage to the air barrier materials, and to transfer the differential air pressure loads to the structure.

15.1.5 Seal all penetrations of the air barrier. If any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are not airtight, make them airtight by sealing the assembly and the interface between the assembly and the air barrier or by extending the air barrier over the assembly. Do not install lighting fixtures with ventilation holes through the air barrier.

15.1.6 Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers such as at elevator shafts.

15.1.7 Ventilation and make-up air intakes, exhausts, atrium smoke exhausts and intakes, and other ventilation opening where leakage can occur during inactive periods shall be fitted with tight sealing dampers that are closed during inactive periods when associated ventilation systems are off.

15.1.8 Compartmentalize spaces under negative pressure such as boiler rooms and provide make-up air for combustion.

15.1.9 Performance Criteria and Substantiation: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the building envelope by the following tests:

15.1.9.1 Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed the leakage rates shown below. The test differential pressure shall be 0.3" w.g. Testing shall be in accordance with ASTM's E 779 (2003) or E- 1827-96 (2002). The Table 1 Recommended Test Envelope Conditions for a Close Envelope Condition in ASTM E1827 shall be followed. Perform positive and negative leakage tests using both pressurization and depressurization. Divide the volume of air leakage in cfm at 0.3" w.g. by the area of the pressure boundary of the building, including roof or ceiling, walls and floor to produce the air leakage rate in cfm/sq.ft. at 0.3" w.g. This area is calculated by totaling the areas of the exterior walls (including walls under ground), the area of the lowest floor (this may be the basement floor), and the area of the roof. Do not test the building until verifying that the continuous air barrier is in place and installed in accordance with the design drawings and the component manufacturer's installation instructions. Repairs to the continuous air barrier, if needed to comply with the required air leakage rate, shall be done in a timely manner. After repairs, testing shall be repeated until the required maximum leakage is achieved.

15.1.9.2 Test the completed building using infrared thermography. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90(R2003). Determine air leakage pathways using ASTM E 1186-03 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified above.

15.1.9.3 Notify the Government at least three working days prior to testing to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.

15.1.9.4 The Designer of Record shall include Specification Section UFGS 07 27 10.00 10 Building Air Barrier System, in the technical specifications for the project and incorporate all the requirements into the design for the construction.

15.2 **WARRANTIES.**

15.2.1 Required warranties are indicated in the Specifications. Contractors are encouraged to offer extended warranties on mechanical equipment and controls, roofing, and other items or systems, either as a part of their proposal (betterment) or an addition to the proposal cost. If Contractor offers as an addition to the proposal cost, such extended warranties will not be a part of the Government's evaluation and selection process.

STATE OF WORK

ATTACHMENTS

ATTACHMENT A

PRELIMINARY SUBSURFACE CHARACTERIZATION

MOTEL CONCEPT

VILLAGE CONCEPT



TETRA TECH

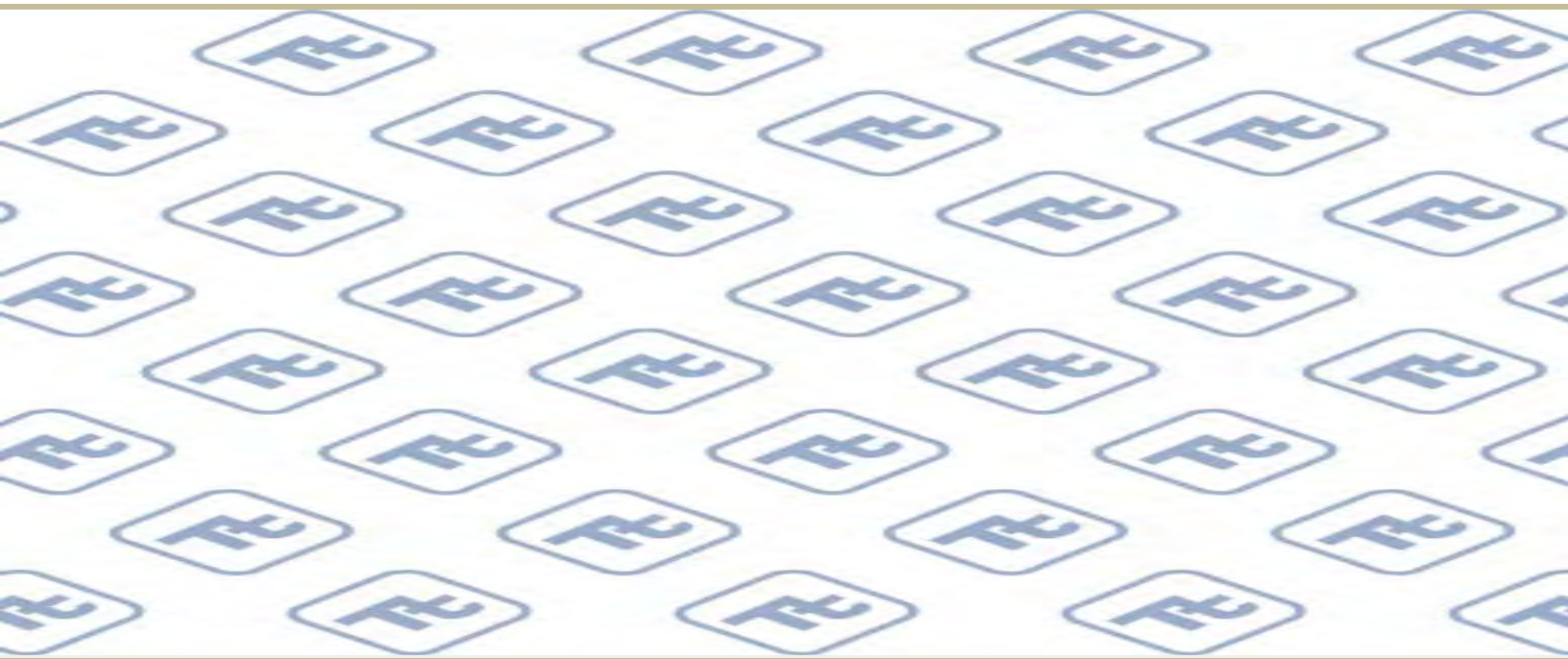


TETRA TECH

Geotechnical Subsurface Investigation Report

PROPOSED BBTS TRANSIENT OFFICER'S TRAINING BARRACKS

Delaware Army National Guard
163 Scannell Boulevard
Bethany Beach, Delaware



Prepared for:

DEARNG/FMO
1 Vavala Way
New Castle, DE 19720

103IG7931

May 2022

Geotechnical Subsurface Investigation Report

Proposed BBTS Transient Officer's Training Barracks

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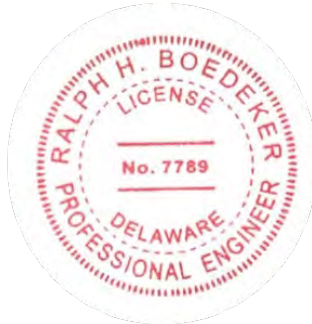
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May 25, 2022

103IG7931

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- Appendix A Site Development Plans and Test Boring Locations
- Appendix B Test Boring Logs
- Appendix C Laboratory Testing Results
- Appendix D Infiltration Testing Logs and Graphs
- Appendix E Pile Design Data and Figures

1.0 INTRODUCTION

This report presents results of a geotechnical subsurface investigation pertaining to the proposed Delaware Army National Guard (DEARNG) Bethany Beach Training Site (BBTS) Transient Training Officer's Barracks (the Site), Bethany Beach, Delaware. Purposes of this study were to investigate subsurface conditions within the Site, formulate foundation design criteria and SWM design criteria for proposed development of the Site, and offer pertinent geotechnical recommendations for construction at the Site.

This geotechnical study evaluated subsurface conditions within the Site, and the report offers recommendations based on an exploration of subsurface soil conditions by means of Standard Penetration Test (SPT) Borings (ASTM International [ASTM] D1586). The scope of this investigation included a test boring program, infiltration testing, laboratory testing of representative soil samples, engineering evaluation of the available data, and preparation of this engineering report. These services proceeded under supervision of a professional geotechnical engineer registered in the State of Delaware.

2.0 DESCRIPTIONS, INVESTIGATIONS, AND SUBSURFACE CONDITIONS

The following sections include a site description and discussions regarding proposed development of the facility, the geotechnical subsurface investigation program, subsurface conditions, and regional geology.

2.1 General Site Description and Proposed Facility Development

The Site is within the DEARNG BBTS facility at 163 Scannell Boulevard, Bethany Beach, Delaware. Proposed location of the training barracks is developed with grass, shrubs, trees, a small shed with chain-link fence, a manhole, monitoring well, and what appears to be a concrete water impoundment structure. The Site is relatively flat at the northern portions of the proposed building area, and includes a soil mound at its southern portion. Proposed development at the Site includes construction of a two-story building, pavements, and stormwater management (SWM) features. Appendix A depicts the proposed development.

The training barracks is to be a slab-on-grade, two-story structure with a finished floor elevation of 7.0 (project datum). The building is to measure approximately 56 x 115 feet in plan view. Existing grades vary across the building area at the Site; based on existing grades and a proposed finished floor elevation of 7.0, net cuts of up to approximately 7 feet (because of soil mound) and net fills of up to approximately 3.5 feet will be required during bulk grading activities.

The project structural engineer indicated that the building likely will be constructed of either load bearing concrete masonry unit (CMU) walls or steel framing with non-load bearing CMU wall infill, with the following estimated design loads (dead load plus live load), which have been assumed for purposes of analysis:

- Maximum column load: 70 kips (steel framing construction)
- Minimum wall loads: 10 kips per lineal foot (CMU load bearing wall construction).

If actual design values vary appreciably from the above values, Tetra Tech should be notified to determine if additional analyses are warranted.

2.2 Geotechnical Subsurface Investigation Program

On March 11, 2022, to collect representative soil samples and identify conditions of subsurface soil and groundwater, eight SPT exploratory soil borings (SB-01 through SB-04 and IT-01 through IT-04) were advanced at the site at approximate locations depicted in Appendix A. Borings SB-01 through SB-04

were advanced within the proposed building area to 20 feet below ground surface (bgs). Borings IT-01 through IT-04 were advanced at proposed SWM features to 10 feet bgs. Because of unsuitable soil conditions encountered within the building area, on May 03, 2022, two additional borings were advanced at the site (SB-05 and SB-06) to 60 feet bgs. These borings were advanced to obtain deeper subsurface soil data for eventual consideration of a deep pile foundation system.

The borings were advanced to collect representative soil samples and identify conditions of subsurface soil and groundwater. Advancements of borings proceeded by use of trailer-mounted drilling rigs. SPT split-spoon samples (ASTM D1586) were collected continuously from each boring to depth of 10 feet, and thereafter at 5-foot intervals. In the SPT procedure, a 2-inch-outside diameter (O.D.) split-barrel sampler is driven into the soil a distance of 18 or 24 inches by a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler from the 6- to 18-inch interval is termed the Standard Penetration Resistance (SPR) N-value. This value can serve as a qualitative indication of in-place relative density of cohesionless (e.g., granular) soils. It is also a secondary indicator of consistency of cohesive soils. Gravel, cobbles, and boulders may induce high blow counts not representative of the soil's relative density/consistency. This indication is qualitative because many factors can significantly affect the SPR value (i.e., drilling crew procedures, drill rigs, and hammer-rod assemblies, etc.).

A Tetra Tech geotechnical staff engineer reviewed performances of the test borings. Test boring logs (Appendix B) include soil and groundwater data obtained from the explorations. Pocket penetrometer field-index testing was conducted on collected cohesive split-spoon soil samples to estimate shear strength characteristics; these test results were recorded in the boring logs. After completion of the test borings, they were backfilled with the auger soil cuttings. Surface elevations at all boring locations were surveyed, except for borings SB-05 and SB-06, surface elevations of which were approximated based on available topographic data.

All soil samples collected during this investigation were reviewed and described visually in Tetra Tech's geotechnical laboratory. Representative soil samples collected from the soil boring program were selected for geotechnical laboratory testing. Thirty-one Water Content Tests (ASTM: D2216) and Percent Finer than a No. 200 Sieve Tests (ASTM: D1140) were performed to assist in determining the general site stratigraphy, and to measure the amount of silt and clay particulate in the soil samples. Three Atterberg Limit Tests (ASTM D4318) were conducted to aid in classification of encountered select cohesive soils at boring locations. Results of the grain-size analysis and Atterberg Limits testing were referenced to determine the Unified Soil Classification System (USCS) designation for the soils

encountered, which provides information regarding soil engineering behavior. A summary of the laboratory testing results appears in Appendix C. Soil samples collected during this investigation will be retained for a period of 2 months, after which they will be discarded unless further instructions are received regarding their disposition.

2.3 Subsurface Conditions

Subsurface conditions throughout the investigation area can be described generally as a series of alluvial deposits varying in thickness, gradation, and density. Subsurface conditions encountered at boring locations are described in detail in the test boring logs (Appendix B). Subsurface conditions between boring locations were interpolated, and may not reflect actual conditions.

Beneath a surficial layer of topsoil, the predominant subsurface conditions within the investigation area can be described generally as a variable colored (brown, gray, or grayish brown) and variable matrix of fine, fine to medium, and fine to coarse sand, with a trace to a little silt (Stratum A on boring logs, USCS: SM, SP-SM, SW-SM, SP, SW, visual). Except at the soil mound on the Site, soils of Stratum A generally have a loose to medium-dense relative density. The mounded soils encountered at SB-03 and SB-04 have a very loose relative density—these soils are likely historically placed fill soils (not virgin soils).

Lenses of a dark gray organic silt (Stratum A1 on the boring logs, USCS: OL) were encountered within the shallower portions of Stratum A, ranging in depth from 2.5 to 11.5 feet bgs. These lenses of organic silt were encountered at each of the boring locations except SB-04 and SB-06. Consistency of the Stratum A1 organic silts is very soft.

A thick lense of gray clay with varying amounts of fine sand was encountered within the deeper advanced borings SB-05 and SB-06 (Stratum A2 on the boring logs, USCS: CL). The clay was encountered at depths ranging from 27 to 36.5 feet bgs at SB-05, and 31.5 to 41.5 feet bgs at SB-06. Consistency of the Stratum A2 clay is very soft.

Apparent groundwater was encountered within each of the soil borings (SBs and ITs), ranging in depth from 2 to 9.5 feet bgs, which corresponds to approximate elevations ranging from 0.5 to 3.4, project datum. Groundwater elevations fluctuate throughout a given year, depending on actual field porosity and variations in seasonal and annual precipitation. Variations in groundwater levels several feet higher or lower than those observed during this evaluation could occur.

2.4 Regional Geology and Groundwater

Generalized Regional Geology

The Site is within the Atlantic Coastal Plain physiographic province. Delaware Geologic Survey (DGS) mapping shows that the Site is underlain by two major geological units, the Omar Formation (Pleistocene Age) and underlying Beaverdam Formation (Miocene to late Pliocene Age). The Omar Formation generally consists of gray calyey-sand to sandy-silt that contains shell fragments. Scattered beds of fine sand and silty fine sand are common. The underlying Beaverdam Formation generally consists of fine to coarse sand with interbeds of fine silty sand and clayey-silt. Depth to bedrock in the general site area is on the order of 2,500 feet below surface grade.

Regional Groundwater

Tetra Tech reviewed the Delaware Geologic Information Resource (DGIR) to reference “normal year” and “wet year” water table mapping in the area of the Site. According to normal year water table mapping, depth to groundwater across the Site typically is less than 3 feet bgs. According to wet year water table mapping, depth to groundwater across the Site is also less than 3 feet bgs.

2.5 Infiltration Testing

Prior to infiltration testing, Tetra Tech provided to the project Civil Engineer for review, preliminary boring logs, including those for borings advanced at IT-01 through IT-04. Infiltrative surfaces have to be at least 2 feet above seasonal high groundwater elevations. Because of shallow groundwater at the Site, the project civil engineer instructed Tetra Tech to conduct infiltration testing near ground surface, below any topsoil or root zones. The purpose of this was to obtain information about infiltration of near-surface soils in the event that construction of designed SWM feature infiltrative surfaces results in elevations of them above current site grades.

On March 22, 2022, near-surface infiltration testing involving single-ring falling head infiltration tests occurred at offsets from boring locations IT-01 through IT-04 (see Appendix A for IT locations). Personnel conducting the infiltration tests used a 12-inch-diameter casing. They sealed the casing by pushing it into the subsurface a minimum 3 inches. During each test, a head of water was established over the testing depth. Testing included a “pre-soak” period. Infiltration testing generally accorded with Delaware Department of Natural Resources and Environmental Control (DNREC) 3.06.2.A-1 “Soil Investigation Procedures for Stormwater BMPs,” and with Appendix 1, “Soil Investigation Procedures for Stormwater Best Management Practices” to the *Delaware BMP Standards & Specifications* (February 2019).

Application of the falling head infiltration testing method accorded with ASTM International (ASTM) D5126. Infiltration testing logs and graphs appear in Appendix D. Laboratory index testing of soils at testing depth occurred for classification purposes, conveyed in Appendix C. Table 1 below summarizes infiltration testing results.

TABLE 1
SUMMARY OF RESULTS FROM INFILTRATION INVESTIGATION AND TESTING

Infiltration Test Location	Existing Surface Elev.	Depth of Off-Set Boring (feet)	Infiltration Test Depth (inches)	Field Infiltration Test Results (inches/hour)
IT-01	3.1	10	12	0.00
IT-02	2.8	10	7	0.30
IT-03	5.6	10	8	60.0
IT-04	5.9	10	14	24.6

Per DNREC regulations, a minimum factor safety of 2.0 should be applied for determination of infiltration design values, and infiltration design values cannot exceed 15 inches per hour.

The low infiltration values encountered at locations IT-01 and IT-02 likely traced to a thin confining lense of silt or organic silt in the subsurface. These near-surface confining levels are anticipated to be thin, and are readily removable to increase infiltration values.

The above-listed infiltration values are based on field data acquired at localized test locations and depths. Variations between test locations should be anticipated. The project civil engineer should determine final project infiltration design values for the various stormwater management features based on final layout and functioning of the features, final depths and site grades, and data provided herein. Design and construction of the SWM faculties should accord with the *Delaware Stormwater BMP Standards & Specifications* (February 2019).

3.0 GEOTECHNICAL EVALUATION AND DESIGN RECOMMENDATIONS

Tetra Tech, Inc. (Tetra Tech) evaluated suitability of subsurface conditions in the investigation area for the proposed barracks building. Tetra Tech considers the organic silts of Stratum A1 unsuitable for support of a conventional shallow foundation system, or for grade support of a heavily loaded floor slab.

The Stratum A1 organic silt has very low shear strength and high compressibility characteristics. Any structural loading of Stratum A1 could cause excessive total and differential settlement of proposed building structural elements, resulting from time-dependent primary consolidation and potentially secondary consolidation (creep). Existing site grades and current proposed design finished floor elevations will require engineered fills of up to 3.5 feet within the building area to achieve finished floor elevation. Consolidation of the Stratum A1 soils also could occur from overburden weight of engineered fill placed at the Site. Placement of shallow foundations and floor slabs over the poor quality Stratum A1 soils could cause excessive and detrimental differential settlement of building structural elements.

Tetra Tech considered removal of the organic soils with replacement by engineered fill. However, because of depths of encounter with organic silt soils, and shallow depths of encounter with groundwater, this alternative was deemed not feasible and/or not cost-effective.

Interim discussions with the project structural engineer resulted in decision to support the structure and floor slabs on a deep pile foundation system. Two pile types were evaluated—auger pressure grouted (APG) piles and timber piles. APG piles are within the industry-termed Auger Cast-in-place (ACIP) pile family. Desired pile structural loads, according to the project structural engineer, are as follows:

- Design axial load for a timber pile: 50 kips
- Design axial load for APG pile: 100 kips.

If actual design values vary appreciably from the above values, the Tetra Tech Geotechnical Department should be notified to determine if additional analyses are warranted.

The following sections discuss design of building foundations and other aspects of the proposed site development that geotechnical conditions would influence. Recommendations regarding general site construction are in Section 4.0.

3.1 Foundation Recommendations

The following sections describe both the APG pile and the timber pile alternatives:

3.1.1 Alternative 1 – Auger Pressure Grouted Piles

APG piles derive their support from a combination of frictional resistance and end bearing. An APG pile's capacity is based on the pile's diameter and embedment length. It is installed by first drilling a borehole to the required depth by use of a hollow-stem, continuous-flight auger. After attainment of the required depth, a high-strength grout is pumped under pressure through the hollow-stem auger to exit through the auger tip. A pre-established amount of grout is pumped before lifting the auger to build up a "grout head" around the outside of the auger. The auger is then withdrawn in a controlled manner as the grout pumping continues, both to maintain the head of grout and to avoid any intrusion of water or soil into the grout column. After completion of grout placement, a piling-reinforcement cage is inserted down into the fresh grout mixture and tied off in position at the surface. Installing APGs would generate auger soil-cutting spoils for either on-site relocation or off-site disposal.

Support for structures on APG piles can come from a concrete mat acting as a pier cap. With use of an APG pile foundation system, loads applied to the piles are transmitted to the soil partially through skin friction that develops on sides of the pile, and partially through end bearing. APG piles have the advantage of providing supporting capacity with a relatively small amount of movement.

Development of recommendations regarding design of the APG pile foundation began with determination of depth of embedment necessary to support the anticipated axial loading. Initial evaluation of both 16- and 18-inch-diameter piles led to selection by the geotechnical engineer of the 18-inch pile based on any potential lateral resistance requirements. Preliminary pile design proceeded by application of methods outlined in FHWA Geotechnical Engineering Circular (GEC) No. 8 – Design and Construction of Continuous Flight Auger Piles (April 2007). Based on depths of embedment required for axial loading and characteristics of existing on-site soils, the approximate maximum ultimate lateral load should not exceed 12 kips.

Tetra Tech recommends the following for design of APG pile foundation systems:

1. Design of APG piles should be based on allowable end bearing and allowable skin friction values specified in Appendix E. To achieve for an 18-inch-diameter pile an allowable axial bearing capacity of 100 kips, the pile should extend to minimum depth of 40 feet below bottom of pile cap

elevation. A factor of safety of 2 was applied to the ultimate axial capacity to obtain the allowable capacity shown on the graph, assuming project specifications will require a pile testing program.

2. Per Table 6.1 of FHWA GEC No. 8, maximum ultimate lateral loads should not exceed 12 kips for an 18-inch-diameter APG pile in soft or loose soil. Lateral deflection should be limited to 0.5 inch. An LPILE analysis should be completed to display deflection, moment, and shear graphs.
3. Total settlement of a pile designed as above is estimated at 0.5 inch or less. Differential settlement is estimated to be less than half total settlement.
4. A minimum spacing requirement between piles should be three diameters from center to center. Closer spacing may require a reduction in axial load capacity. If the pile cap is in firm contact with the ground, no reduction in efficiency is required.
5. Grout cover should be a minimum of 3 inches between the reinforcement and the soil. Grout compressive strength should be an average of 5,000 pounds per square inch (psi) for the 28-day break. Reinforcement cages should be installed within drilled piles within 30 minutes of grout placement.
6. Reinforcing bars should consist of a minimum ASTM A615 Grade 60 steel. Designers should include reinforcement cages that use fewer heavy bars instead of many smaller bars, and ensure that the cages are no longer than the minimum necessary to provide structural capacity and anchorage. Reinforcing cages should be fabricated so that lifting and handling does not cause permanent distortion or racking.
7. Piles undergoing uplift loads should have a minimum of one reinforcing bar centrally located and extending the full length of the pile.
8. Downdrag load is expected, caused by consolidation or deformation of a soft, cohesive soil layer over a stiff layer. Anticipation is for placement of fill on the Site to elevation 7 (project datum). Settlement due to fill placement should be monitored. Installation of piles shall not occur until fill loads have consolidated the underlying in-situ material to reduce downdrag loads.
9. A test pile program should be required in project specifications to demonstrate that the contractor's construction methods, equipment, standards of workmanship, and tolerances will

result in acceptable pile installation and confirm allowable load capacity of the piles. The pile load testing program should accord with ASTM Standards.

3.1.2 Alternative 2 – Timber Piles

Timber piles are usually of round, tapered cross section; most timber piles used in the eastern half of the United States are Southern Pine. ASTM D25, Standard Specification for Round Timber Piles, presents guidelines on the minimum timber pile parameters including dimensions, straightness, and knot sizes. Typical length of a timber pile ranges between 15 and 75 feet for Southern Pines; top (butt) diameter ranges between 12 and 22 inches.. The taper of a timber pile is effective in increasing shaft resistance, from which timber piles obtain their load-carrying capacity through friction.

Applied for preliminary design was the Effective Stress β -Method for mixed soil profiles, as outlined in Section 7.2.1.3.4 of FHWA GEC No. 12 – Design and Construction of Driven Pile Foundations. For final design considerations, timber piles should be sized so that uplift force due to transient loads from wind, snow, ice, seismic, and structural factors does not exceed dead weight of the pile plus frictional resistance between the pile and soil. Additionally, the design must account for uplift forces due to potential frost heave (adfreeze) and downdrag.

Evaluation of the driven timber pile foundations was based on pile dimensions, properties of existing on-site soils, and loading conditions conveyed by the structural engineer. Tetra Tech's recommendations regarding design of the driven timber pile foundation system are as follows:

1. Driven timber piles should be designed based on allowable end bearing and allowable skin friction values specified in Appendix E. To achieve an allowable axial bearing capacity of 25 tons (50 kips), the piles should extend to minimum depth of 40 feet below bottom of pile cap elevation. Minimum pile top (butt) and pile bottom (tip) diameters should be 16 inches and 12 inches, respectively. Tetra Tech applied a factor of safety of 2 to the ultimate axial capacity to obtain the allowable capacity shown on the graph, assuming requirement for a pile testing program in project specifications.
2. A minimum spacing requirement between piles should be three diameters from center to center. Closer spacing may require a reduction in axial load capacity. If the pile cap is in firm contact with the ground, no reduction in efficiency is required.
3. Downdrag load is expected, caused by consolidation or deformation of a soft, cohesive soil layer over a stiff layer. Anticipation is for placement of fill on the Site to elevation 7 (project datum).

Settlement due to fill placement should be monitored. Installation of piles shall not occur until fill loads have consolidated the underlying in-situ material to reduce downdrag loads.

4. A test pile program should be required in project specifications to demonstrate that the contractor's construction methods, equipment, standards of workmanship, and tolerances will result in acceptable pile installation and confirm allowable load capacity of the piles. The pile load testing program should accord with ASTM Standards.

3.2 Seismic Design

Based on subsurface conditions encountered during the test boring program and review of regional geologic maps, Tetra Tech recommends utilization of a site Class E for seismic design purposes. The site class definition is in Section 1613 of the International Building Code.

3.3 Groundwater

Based on measured groundwater depths and proposed building finished floor elevations, encounter with groundwater is possible during construction of pile caps, grade beams, and underground utilities. Apparent groundwater was encountered within each of the soil borings, ranging in depth from 2 to 9.5 feet bgs, corresponding to elevations 0.5 to 3.4, project datum. The awarded contractor should be prepared to conduct dewatering activities if groundwater is encountered within site excavations.

Groundwater elevations fluctuate throughout a given year, depending on actual field porosity and variations in seasonal and annual precipitation. Variations in groundwater levels several feet higher or lower than those observed during this evaluation could occur.

4.0 GENERAL CONSTRUCTION RECOMMENDATIONS

The following sections discuss preparation of the Site, engineered fill, APG and timber piles, and quality control and quality assurance of site work.

4.1 Proofrolling and Site Preparation

At start of construction, all pavements, topsoil, vegetation, roots, structures, etc. should be stripped and entirely removed from all proposed bulk grading areas. Prior to foundation construction and placement of engineered fill in building and pavement bulk grading “fill” areas, the subgrade of fill areas should be proof-rolled with a minimum 15-ton roller in the presence of a qualified soils technician. Proof-rolling will increase density of exposed subgrade areas that will have been loosened or disturbed during stripping and clearing operations. Proof-rolling will also expose potential localized soft and yielding areas, particularly within the historical fill materials (soil mound at site). The exposed surfaces should be compacted to a visually firm and stable condition. Subgrade compaction will facilitate placement and compacting of embankment fill at the required densities. Proof-rolling should also occur at final “cut” or “at grade” areas (building and pavement areas) to ensure a firm and stable subgrade.

Soil subgrade disturbance should be minimized by providing positive surface drainage and limiting construction traffic on exposed subgrade soils. Moreover, excavations for foundation systems (pile caps, and grade beams) should not be left open for long periods of time because precipitation may result in collection of water within the excavation. Provisions for removal of water by drainage or sumping should be established. Subgrade soils disturbed by precipitation and construction traffic should be either (1) scarified, dried, and re-compacted, or (2) undercut and replaced with engineered fill.

4.2 Engineered Fill

Engineered fill required to bring structural building and pavement areas to grade should be free of organic material, topsoil, debris, and gravel greater than 3 inches in largest dimension. Engineered fill should also be used to backfill foundation excavations (e.g., shallow foundations, pile caps, and grade beams) and utility trenches within building and pavement areas.

The granular soils of Stratum A are considered suitable for use as engineered fill. Imported borrow material should meet the USCS classifications of SW, SM, SC, or GW, with no more than 25% passing a No. 200 sieve (ASTM D1140), and a plasticity index (ASTM D4318) not exceeding 6.

Engineered fill material should be placed in horizontal thin lifts with compacted thickness no greater than 8 inches. Engineered fill lifts for hand tampers should not exceed 4 inches. Each thin lift of fill/backfill material placed below structural elements (i.e., foundations and floor slabs) and pavements should be compacted to at least 95% of maximum dry density, as determined by the Standard Proctor Test (ASTM D698).

Moisture contents of placed engineered fill should facilitate compaction (typically at +/- 2-3% of optimum moisture, per ASTM D698). A qualified geotechnical technician should monitor and test placement and compaction of engineered fill on a full-time basis.

American Association of State Highway and Transportation Officials (AASHTO) No. 57 Stone could also be used as backfill within localized undercut zones—placed in maximum 12-inch lifts and compacted by use of a vibratory plate compactor.

4.3 APG Pile Installation (Foundation Alternative 1)

APG piles should have an embedment length of at least 40 feet below bottom of pile cap. Actual bearing elevation for each pile should be determined in the field by a qualified geotechnical technician working under supervision of a geotechnical engineer familiar with the recommendations of this report. During pile construction, after the hollow-stem auger has reached approved elevations and before raising the auger, a minimum theoretical initial grout head of 10 feet should be pumped. Positive rotation of the auger should be maintained at all times during grout placement.

The rate of grout injection and auger withdrawal should always be coordinated to maintain both the minimum grout head and total volume of grout (to be at least 125% of the theoretical volume for each 2-foot pile depth increment). If grout pumping is interrupted for any reason, or a loss of grouting pressure occurs, the pile auger should be lowered at least 5 feet below the level where the interruption or pressure loss occurred, with pumping of grout continuing. After observation of initial grout return, the pile contractor should continue pumping grout while removing the auger until the auger tip reaches the surface. A pile should not be installed within six pile diameters center-to-center of a pile that is filled with grout less than 24 hours old. If the grout level in any completed pile drops during installation of an adjacent pile, the pile should be replaced.

Drilling equipment for APG pile installations should be outfitted with an automated monitoring system to monitor and confirm pertinent installation parameters. Recorded parameters should include time, depth,

most inclination, drilling stem torque, and grout volume versus depth. The automated system should be able to measure and display volume of grout pumped per unit depth increment.

Methods applied and equipment used to install APGs can influence APG pile-bearing capacity, and these vary from contractor to contractor. The piling contractor should be solely responsible for quality control of the work, and should submit an installation work plan and quality control program before initiation of work. Only contractors that can demonstrate experience in installation of APGs for similar projects should be allowed to bid on this project.

A representative of a geotechnical engineer should observe installation of the piles on a full-time basis to check that the appropriate bearing stratum is penetrated and to monitor pile construction procedures.

4.4 Driven Timber Pile Installation (Foundation Alternative 2)

Driven timber piles should have an embedment length of at least 40 feet below bottom of pile cap, and minimum butt and tip diameters of 16 and 12 inches, respectively. The contract pile length should include an additional 2-foot embedment in the footing and a 1-foot allowance for cutoff due to driving damage. Actual bearing elevation for each timber pile should be determined in the field by a qualified geotechnical technician working under supervision of a geotechnical engineer familiar with the recommendations of this report. A pile driving installation record should be documented for each pile installed on the Site.

Lifespans of timber piles vary depending on their environment. Tetra Tech recommends treatment of all timber piles with an oil-borne system (primarily creosote). Treated timber piles can be used above or below water, and can retain function under most types of adverse conditions. Several factors can deteriorate them. Fungi that require moisture, oxygen, and favorable temperatures can decay timber piles—most prevalent in the uppermost 6 feet of soil. If the wood stays very dry, decay will be limited due to lack of moisture. Insects including termites, beetles, and marine borers may affect integrity of a timber pile if not treated properly. Fluctuation of the groundwater surface may subject the embedded pile to repeated cycles of wetting and drying. Timber piles will lose part of their strength if subjected to prolonged high temperatures; therefore, they should not be placed under hot structures such as blast furnaces.

Conventional pile driving equipment and methods can be applied to install timber pile foundations. Internal combustion impact (drop) hammers are the most commonly used devices to drive timber piles. Selection of hammer size affects efficiency of pile installation. Drop hammers can damage the pile head if driving stresses are not controlled by limitation of stroke distance and insertion of a hammer cushion

between the anvil, which sits on the pile head, and ram. For installation of timber piles, the hammer weight should not be less than 3500 pounds, and the drop should not exceed 12 feet.

Tetra Tech recommends that prior to construction, the contractor or contractor's engineer submit a wave equation analysis that determines optimal hammer size, required blow count to obtain the specified capacity, and driving stresses imparted to the pile. Overdriving of timber piles can result in damage to fibers or brooming at the pile head and damage to the pile toe. Overdriving results in degeneration of fibers, which hastens material decay, and subsequently reduces pile strength.

A pile load testing program, in accordance with ASTM Standards, should be implemented to ensure achievement of allowable capacities.

Tetra Tech recommends the following measures before, during, and following drives of timber piles:

Inspect timber piles prior to installation. Reject piles with knot clusters bends, sweeps, bows, or other irregularities. Apply preservative oil to cuts, holes, and abrasions in piles damaged during transportation or storage. Avoid splicing timber piles, particularly if they are expected to carry a tensile load or a lateral load. Best practice is to drive timber piles within 6 months after treatment.

During installation of each pile, an on-site geotechnical technician should complete a pile driving record pertaining to that pile. Use light-weight hammers with appropriate cushions between the hammer and the pile. Place steel bands near the pile head, and a steel shoe on the toe. Ensure that the pile is plumb prior to and during driving operations. Stop driving as soon as the pile has reached practical refusal. If the head of a timber pile starts splitting, and penetration and bearing are satisfactory, stop driving the pile. Do not drive timber piles to cutoff length because hammer impact causes some damage to the top wood fibers even though this may not be visible. Provide for at least 1 foot of cutoff. To protect ends of piles from degradation, treat pile cutoff surfaces in accordance with American Wood Protection Association (AWPA) Standard M-4 (or similar American National Standards Institute [ANSI] Accredited Standards). It is essential to cut piles at the exact elevation level; concave, convex, or inclined heads are not acceptable.

4.5 Excavation Safety

All utility and foundation excavation should accord with Occupational Safety and Health Administration (OSHA) guidelines.

4.6 Site Work Quality Control and Assurance

All site clearing, grading, proofrolling, fill placement, foundation construction, and pile installation should be monitored by a qualified geotechnical technician working under supervision of a geotechnical engineer. Typically, the owner retains the project geotechnical engineer to conduct third-party inspection or construction monitoring services. The technician should observe and document site preparation and proof-rolling, engineered fill construction, foundation subgrades, and foundation construction—and should conduct appropriate field tests, as necessary, to verify that construction proceeds in accordance with applicable plans, specifications, and acceptable construction practice. Conclusions and recommendations in this report are based on the premise of competent field engineering and monitoring during construction.

5.0 REPRESENTATIONS

Preparation of this report accorded with generally accepted engineering principles and practices, and was based on soil and groundwater conditions encountered during the field exploration. No warranty is expressed or implied. Although generalized subsurface conditions have been inferred through interpolation and/or extrapolation of acquired field and laboratory data, actual subsurface conditions between soil boring locations are unknown. As a result, recommendations in this report may require modifications based on subsurface conditions actually encountered during construction. Tetra Tech should be notified if conditions encountered during construction differ from those indicated by test borings, thus possibly requiring re-evaluation of recommendations offered in this report. This report applies solely to size, type, and location of the structure described herein. If changes are proposed, this report will not be considered valid unless and until Tetra Tech has reviewed the changes and accordingly altered and re-approved recommendations of this report.

Construction bidders should thoroughly familiarize themselves with the on-site subsurface soil and groundwater conditions described herein. Tetra Tech recommends provision of this report to bidding contractors so they can develop their own interpretations of the available data. Tetra Tech, DEARNG, and the State of Delaware assume no responsibility for interpretation or deductions by the awarded contractor based on information in this report. Variations in subsurface conditions are expected.

APPENDIX A

Site Development Plans and Test Boring Locations

APPENDIX B

Test Boring Logs

FIELD DESCRIPTION AND LOGGING SYSTEM FOR SOIL EXPLORATION

GRANULAR SOILS

(Sand, Gravel & Combinations)

<u>Density</u>	<u>N (blows)*</u>
Very Loose	5 or less
Loose	6 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	51 or more

Particle Size Identification

Boulders	8 in. diameter or more
Cobbles	3 to 8 in. diameter
Gravel	Coarse (C) 3 in. to ¾ in. sieve
	Fine (F) ¾ in. to No. 4 sieve
Sand	Coarse (C) No. 4 to No. 10 sieve (4.75mm-2.00mm)
	Medium (M) No. 10 to No. 40 sieve (2.00mm – 0.425mm)
	Fine (F) No. 40 to No. 200 sieve (0.425 – 0.074mm)
Silt/Clay	Less Than a No. 200 sieve (<0.074mm)

Relative Proportions

<u>Description Term</u>	<u>Percent</u>
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS

(Silt, Clay & Combinations)

<u>Consistency</u>	<u>N (blows)*</u>
Very Soft	3 or less
Soft	4 to 5
Medium Stiff	6 to 10
Stiff	11 to 15
Very Stiff	16 to 30
Hard	31 or more

Plasticity

<u>Degree of Plasticity</u>	<u>Plasticity Index</u>
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	> 22

ROCK

(Rock Cores)

<u>Rock Quality Designation (RQD), %</u>	<u>Rock Quality Description</u>
0-25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

RQD: Rock Quality Designation

TCR: Total Core Recovery

SCR: Solid Core Recovery

***N - Standard Penetration Resistance.** Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 18 inches into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. The number of hammer blows to drive the sampler through each 6 inch interval is recorded; the number of blows required to drive the sampler through the final 12 inch interval is termed the Standard Penetration Resistance (SPR) N-value. For example, blow counts of 6/8/9 (through three 6-inch intervals) results in an SPR N-value of 17 (8+9).

Groundwater observations were made at the times indicated. Groundwater elevations fluctuate throughout a given year, depending on actual field porosity and variations in seasonal and annual precipitation.



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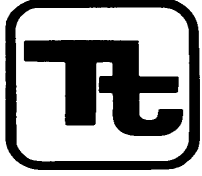
TEST BORING LOG

Project Name:		BBTS TRANSIENT TRAINING BARRACKS			Project No.: 103P8038		
Project Location:		DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE			Page 1 of 1		
Boring No.:		SB-01		Dates(s) Drilled: 03/11/22		Inspector: S. MCCOY	
Surface Elev:		3.5		Drilling Method: SPT - ASTM D1586		Driller: B. WALTERS	
Drilling Contractor:		CGC		Groundwater Depth (ft): 3.0		Total Depth (ft): 20.0	

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.3			APPARENT TOPSOIL (3")						
1	0.0	2.0	0.3			A (SW-SM)	GRAY FINE TO MEDIUM SAND WITH A LITTLE SILT	3	3	6	7	9	
2	2.0	4.0					GRAY FINE TO MEDIUM SAND, TRACE SILT	3	4	4	4	8	
3	4.0	6.0		4.5		A (SM)	GRAY FINE SAND WITH SOME SILT	2	1	WH	1	1	
			4.5	6.3		A1 (OL)	DARK GRAY ORGANIC SILT						
4	6.0	8.0	6.3			A (SW-SM)	GRAY FINE TO MEDIUM SAND, TRACE SILT.	5	4	9	10	13	
5	8.0	10.0					GRAY FINE SAND WITH WITH A LITTLE SILT.	4	6	10	10	16	
6	13.0	15.0				A (SP-SM)	GRAY FINE SAND, TRACE SILT.	4	4	7	8	11	
7	18.0	20.0		20.0			GRAY FINE SAND, TRACE SILT.	4	4	4	11	8	

Notes/Comments:
Pocket Penetrometer Testing

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
N: Number of blows to drive spoon from 6" to 18" interval.



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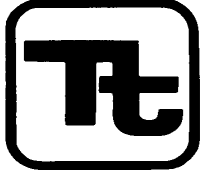
TEST BORING LOG

Project Name:	BBTS TRANSIENT TRAINING BARRACKS	Project No.:	103P8038
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-02	Dates(s) Drilled:	03/11/22
Surface Elev:	4.1	Inspector:	S. MCCOY
Drilling Contractor:	CGC	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	3.0
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N
	From	To	From	To								
			0.0	0.3			APPARENT TOPSOIL (4")					
1	0.0	2.0	0.3			A (SW-SM) BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT.	1	2	1	4	3	
2	2.0	4.0				A (SP) GRAY FINE SAND	1	2	3	5	5	
3	4.0	6.0				A (SM) GRAY FINE TO MEDIUM SAND AND SILT	2	1	1	2	2	
4	6.0	8.0	5.0			A1 (OL) DARK GRAY ORGANIC SILT, SOME FINE SAND (USCS: OL)	WH	WH	WH	2	WH	
5	8.0	10.0	8.7			A (SM) BROWN FINE SAND WITH A LITTLE SILT.	2	6	9	12	15	
6	13.0	15.0				A (SP-SM) GRAY FINE SAND , TRACE SILT	6	8	9	9	17	
7	18.0	20.0		20.0		A (SP-SM) GRAY FINE SAND, TRACE SILT	1	2	5	8	7	

Notes/Comments:
Pocket Penetrometer Testing

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.

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TEST BORING LOG

Project Name:	BBTS TRANSIENT TRAINING BARRACKS	Project No.:	103P8038
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-03	Dates(s) Drilled:	03/11/22
Surface Elev.:	8.3	Inspector:	S. MCCOY
Drilling Contractor:	CGC	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	6.5
		Total Depth (ft):	25.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.3			APPARENT TOPSOIL (3")						
1	0.0	2.0	0.3			A (SM) GRAYISH BROWN FINE TO MEDIUM SAND, LITTLE SILT (PROBABLY FILL SOILS)	1	2	2	2			4
2	2.0	4.0				A (SP) GRAY FINE SAND, TRACE SILT. (PROBABLY FILL SOILS)	2	1	2	2			3
3	4.0	6.0				A (SP) GRAY FINE SAND	6	1	1	1			2
4	6.0	8.0				A (SP) GRAY FINE SAND	4	6	4	2			10
5	8.0	10.0	7.5			A1 (OL) DARK GRAY SILT AND FINE SAND. (USCS: OL)	WH	1	6	3			7
6	13.0	15.0	9.0			A (SP) GRAY FINE SAND	3	5	8	8			13
7	18.0	20.0				A (SW) GRAY FINE TO MEDIUM SAND	3	5	6	6			11
8	23.0	25.0		25.0		A (SW) GRAY FINE TO MEDIUM SAND	4	4	10	9			14
							WET ON SPOON AT 7'.						
							WATER LEVEL THROUGH AUGERS AT 6.5'.						
							CAVED AT 4', DRY.						

Notes/Comments:
Pocket Penetrometer Testing

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



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Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-04	Dates(s) Drilled:	03/11/22
Surface Elev.:	10.7	Inspector:	S. MCCOY
Drilling Contractor:	CGC	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	9.5
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.3			APPARENT TOPSOIL (4")						
1	0.0	2.0	0.3			A (SW-SM)	GRAYISH BROWN FINE TO MEDIUM SAND, TRACE SILT (PROBABLY FILL SOILS)	1	1	1	1		2
2	2.0	4.0				A (SW)	GRAYISH BROWN FINE TO MEDIUM SAND. (PROBABLY FILL SOILS)	1	1	1	1		2
3	4.0	6.0		6.0		A (SW)	GRAYISH BROWN FINE TO MEDIUM SAND (PROBABLY FILL SOILS)	WH	WH	1	1		1
4	6.0	8.0	6.0			A (SW-SM)	GRAYISH BROWN FINE TO MEDIUM SAND, TRACE SILT	1	1	2	1		3
5	8.0	10.0				A (SW-SM)	GRAYISH BROWN FINE TO MEDIUM SAND, TRACE SILT	2	1	2	3		3
6	13.0	15.0				A (SM)	DARK GRAY FINE SAND WITH SOME SILT	4	3	5	4		8
7	18.0	20.0				A (SP)	GRAY FINE SAND	4	7	9	12		16
8	23.0	25.0				A (SP)	GRAY FINE SAND	4	4	7	6		11
9	28.0	30.0		30.0			GRAY FINE SAND	4	3	4	5		7
							WET ON SPOON AT 10'.						
							WATER LEVEL THROUGH AUGERS AT 9.5'.						
							CAVED AT 6', DRY						

Notes/Comments:
Pocket Penetrometer Testing

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



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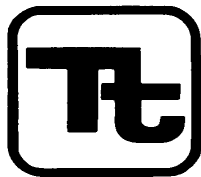
TEST BORING LOG

Project Name:	BBTS TRANSIENT TRAINING BARRACKS	Project No.:	103P8038
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-05	Dates(s) Drilled:	05/03/22
Surface Elev.:	~3.5	Inspector:	S. MCCOY
Drilling Contractor:	CGC	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	3.0
		Total Depth (ft):	60.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.5			APPARENT TOPSOIL (6")						
1	0.0	2.0	0.5	2.5	A (SM)		GRAYISH BROWN FINE TO MEDIUM SAND WITH SOME SILT.	4	5	6	6	11	
2	2.0	4.0	2.5	4.3	A1 (OL)		DARK GRAY ORGANIC SILT AND FINE SAND.	4	2	2	2	4	
3	4.0	6.0	4.3		SP-SM		LIGHT GRAY FINE TO MEDIUM SAND, TRACE SILT.	7	3	6	11	9	
4	6.0	8.0			A (SP)		LIGHT GRAY FINE SAND, TRACE SILT.	10	6	9	7	15	
5	8.0	10.0		9.5	A (SM)		LIGHT GRAY FINE SAND WITH SOME SILT.	2	3	4	1	7	
			9.5	11.5	A1 (OL)		DARK GRAY ORGANIC SILT WITH SOME FINE SAND.						
6	13.0	15.0	11.5				GRAY FINE SAND WITH A LITTLE SILT.	5	6	8	10	14	
					A (SP-SM)								
7	18.0	20.0					GRAY FINE SAND WITH A LITTLE SILT.	4	5	5	9	10	
8	23.0	25.0		27.0	SM		GRAY FINE TO MEDIUM SAND WITH A LITTLE SILT.	3	9	10	12	19	
9	28.0	30.0	27.0				GRAY CLAY AND FINE SAND, TRACE SHELL FRAGMENTS.	1	1	1	1	2	
					A2 (CL)								
10	33.0	35.0					GRAY CLAY WITH A LITTLE FINE SAND.	WH	WH	2	2	2	
				36.5									
11	38.0	40.0	36.5		A (SM)		GRAY FINE SAND AND SILT	3	4	9	12	13	
12	43.0	45.0		43.5			GRAY FINE SAND AND SILT.	2	3	4	5	7	
			43.5										
13	48.0	50.0			A (SW)		LIGHT GRAY FINE TO COARSE SAND, TRACE SILT.	20	27	37	33	64	
14	53.0	55.0					LIGHT GRAY FINE TO COARSE SAND, TRACE SILT.	20	37	50/5"		>50	
15	58.0	60.0		60.0	A (SM)		LIGHT GRAY FINE TO MEDIUM SAND WITH A LITTLE SILT.	16	9	5	11	14	

Notes/Comments: **BEGAN MUD ROTARY AT 25'.**
Pocket Penetrometer Testing
 S10: 0.5 TSF
 S11: 1.75 TSF
 S12: 1.5 TSF
WET ON SPOON AT 3'.
WATER LEVEL THROUGH AUGERS AT 3.5'
WATER LEVEL END OF DRILLING AT 3.5'.

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



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TEST BORING LOG

Project Name:	BBTS TRANSIENT TRAINING BARRACKS	Project No.:	103P8038
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-06	Dates(s) Drilled:	05/03/22
Surface Elev.:	-7.0	Inspector:	S. MCCOY
Drilling Contractor:	CGC	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	6.0
		Total Depth (ft):	60.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.5			APPARENT TOPSOIL (6")						
1	0.0	2.0	0.5			A (SM)	LIGHT BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT. (PROBABLY FILL SOILS)	4	3	1	WH	4	
2	2.0	4.0					LIGHT BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT. (PROBABLY FILL SOILS)	4	1	2	1		3
3	4.0	6.0		5.0		A (SP SM)	GRAYISH BROWN FINE TO MEDIUM SAND, TRACE SILT.	3	WH	1	1	1	
4	6.0	8.0	5.0			A (SM)	GRAY FINE TO MEDIUM SAND WITH SOME SILT.	2	3	8	7	11	
5	8.0	10.0				A (SP)	LIGHT GRAY FINE SAND, TRACE SILT	3	6	7	4	13	
6	13.0	15.0					LIGHT GRAY FINE SAND, TRACE SILT	6	8	10	13	18	
7	18.0	20.0					LIGHT GRAY FINE SAND, TRACE SILT	3	5	8	11	13	
8	23.0	25.0					LIGHT GRAY FINE SAND, TRACE SILT	4	7	11	14	18	
9	28.0	30.0				A (SM)	GRAY FINE SAND AND SILT	2	1	4	3	5	
				31.5		A2 (CL)	GRAY CLAY WITH SOME FINE SAND.	WH	1	1	1	2	
10	33.0	35.0	31.5				GRAY CLAY WITH A LITTLE FINE SAND.	WH	1	1	2	2	
				41.5		A (SM)	GRAY FINE SAND AND SILT.	2	3	5	9	8	
12	43.0	45.0	41.5				GRAY FINE TO MEDIUM SAND WITH SOME SILT	3	10	12	18	22	
13	48.0	50.0				A (SW)	GRAY FINE TO COARSE SAND, TRACE SILT	30	44	50/4"		>50	
14	53.0	55.0					GRAY FINE TO COARSE SAND, TRACE SILT	28	44	50/4"		>50	
15	58.0	60.0											

Notes/Comments: Pocket Penetrometer Testing BEGAN MUD ROTARY AT 25'.
 WET ON SPOON AT 6'.
 WATER LEVEL THROUGH AUGERS AT 6'
 WATER LEVEL END OF DRILLING AT 7'.

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.

APPENDIX C

Laboratory Testing Results

**LABORATORY TESTING SUMMARY
BBTS TRANSIENT TRAINING BARRACKS
DEARNG, BETHANY BEACH, DELAWARE**

SPT Soil Boring No.	Sample No.	Stratum	Depth of Sample (ft.)		Water Content, % (ASTM D2216)	Percent Silts/Clays, % (ASTM D1140)	Atterberg Limits (ASTM D4318)			USCS Classif. (ASTM D2487)
			From	To			Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	
SB-01	2	A	2.0	4.0	19.9	12.5	-	-	-	-
	3	A	4.0	6.0	14.9	24.0	-	-	-	-
	4	A	6.0	8.0	15.6	5.6	-	-	-	-
SB-02	2	A	2.0	4.0	18.4	3.0	-	-	-	-
	3	A	4.0	6.0	14.6	38.1	-	-	-	-
	4	A1	6.0	8.0	28.5	77.4	42	23	19	OL
SB-03	2	A	2.0	4.0	21.1	5.0	-	-	-	-
	3	A	4.0	6.0	3.4	1.8	-	-	-	-
	4	A	6.0	8.0	13.4	1.8	-	-	-	-
	5	A1	8.0	10.0	29.0	63.2	43	24	10	OL
	6	A	13.0	15.0	23.7	1.8	-	-	-	-
SB-04	2	A	2.0	4.0	5.4	1.9	-	-	-	-
	5	A	8.0	10.0	12.2	2.0	-	-	-	-
	6	A	13.0	15.0	21.3	27.9	-	-	-	-
SB-05	9	A2	28.0	30.0	39.1	75.4	-	-	-	-
	10	A2	33.0	35.0	39.2	87.7	42	20	22	CL
	11	A	38.0	40.0	21.2	45.5	-	-	-	-
SB-06	10	A2	33.0	35.0	36.7	78.7	-	-	-	-
	11	A2	38.0	40.0	35.2	87.1	-	-	-	-
	12	A	43.0	45.0	24.6	44.3	-	-	-	-
IT-01	1	A	0.0	2.0	13.2	1.6	-	-	-	-
	2	A	2.0	4.0	9.4	33.7	-	-	-	-
	3	A	4.0	6.0	24.3	10.6	-	-	-	-
IT-02	1	A	0.0	2.0	15.0	7.9	-	-	-	-
	2	A	2.0	4.0	16.5	17.7	-	-	-	-
	3	A	4.0	6.0	21.5	7.3	-	-	-	-
IT-03	1	A	0.0	2.0	13.0	16.9	-	-	-	-
	2	A	2.0	4.0	15.7	11.4	-	-	-	-
	3	A	4.0	6.0	17.8	1.7	-	-	-	-
IT-04	2	A	2.0	4.0	15.5	6.3	-	-	-	-
	3	A	4.0	6.0	21.6	2.7	-	-	-	-

Notes:

- 1) Sample depths based on feet below grade at time of exploration.

UNIFIED SOIL CLASSIFICATION SYSTEM [Casagrande (1948)]

Major Divisions		Group Symbols	Typical Descriptions	Laboratory Classifications			
Coarse Grained Soils (More than half of material is larger than No. 200 sieve)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravel (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting C_u or C_c requirements for GW		
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines			
		Gravel with fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A Line or I_p less than 4	Limits plotting in hatched zone with I_p between 4 and 7 are borderline cases requiring use of dual symbols	
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line with I_p greater than 7		
	Sands (More than half of coarse fraction is smaller than No. 4 Sieve)	Clean sands (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting C_u or C_c requirements for SW		
			SP	Poorly graded sands, gravelly sands, little or no fines			
		Sands with fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures	Atterberg limits below A Line or I_p less than 4	Limits Plotting in hatched zone with I_p between 4 and 7 are borderline cases requiring use of dual symbols	
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above A line with I_p greater than 7		
		Determine Percentage of sand and gravel from grain size curve. Depending on Percentage of fines (fraction smaller than No. 200 sieve), coarse-grained soils are classified as follows: Less than 5 percent GW, GP, SW, SP More than 12 percent GM, GC, SM, SC 5 to 12 percent Borderline cases requiring dual symbols ⁽¹⁾					
		Major Divisions		Group Symbols	Typical Descriptions	For soils plotting nearly on A line use dual symbols i.e., $I_p = 29.5$, $w_L = 60$ gives CH-MH. When w_L is near 50 use CL-CH or ML-MH. Take near as ± 2 percent.	
Fine-grained soils (More than half of material is smaller than No. 200 sieve)	Silt and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity				
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
		OL	Organic silts and organic silty clays of low plasticity				
	Silt and Clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
		CH	Inorganic clays of high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity, organic silts				
	Highly organic soils	Pt	Peat and other highly organic soils				

(1) Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC. well-graded gravel-sand mixture with clay binder.

APPENDIX D

Infiltration Testing Logs and Graphs

**Falling Head
Single Ring Infiltration Test
12 inch Ring**

Project: Tetra Tech-Bethany Beach

3/22/2022

Project No.: 10-22-131

Test Location: IT-1

Weather Sunny, 50

Depth of Ring Embedment: 3 in.

Test Depth: 12"

Tester/ Technician Performing Test: M. Hynes

	Time (t)	Time Elapsed (min)	Hydraulic Head (h) (in)	Change (Δh) (in)	Incremental Inf. Rate (in/hr)
Presoak	12:10	-	12.00	-	-
	1:10	60	12.00	0.00	N/A
Test 1	0	-	6.00	-	-
	15	15	6.00	0.00	0.0
	30	15	6.00	0.00	0.0
	45	15	6.00	0.00	0.0
	60	15	6.00	0.00	0.0
			Test 1	Avg. Inf. Rate (in./hr.):	0.0
Test 2	0	-	6.00	-	-
	15	15	6.00	0.00	0.0
	30	15	6.00	0.00	0.0
	45	15	6.00	0.00	0.0
	60	15	6.00	0.00	0.0
			Test 2	Avg. Inf. Rate (in./hr.):	0.0

**Falling Head
Single Ring Infiltration Test
12 inch Ring**

Project: Tetra Tech-Bethany Beach

3/22/2022

Project No.: 10-22-131

Test Location: IT-2

Weather Sunny, 50

Depth of Ring Embedment: 3 in.

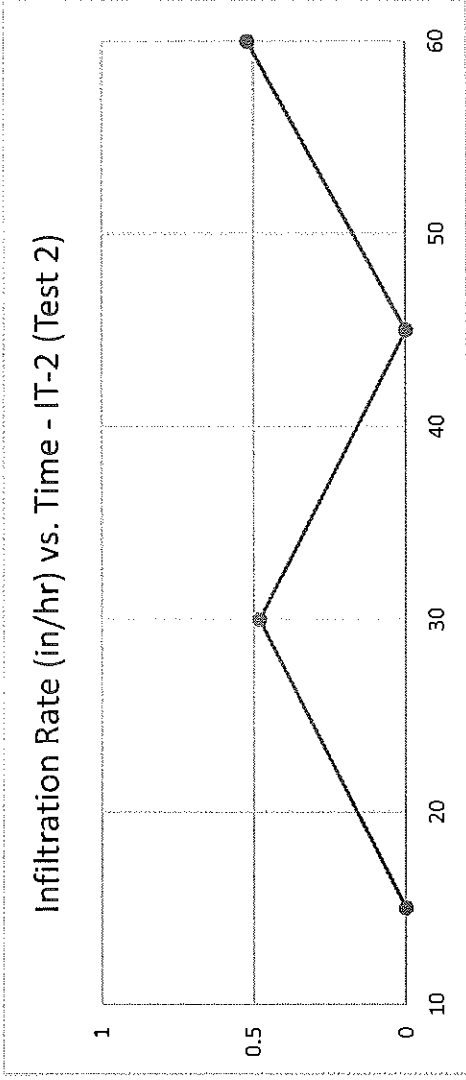
Test Depth: 7.0"

Tester/ Technician Performing Test: M. Hynes

	Time (t)	Time Elapsed (min)	Hydraulic Head (h) (in)	Change (Δh) (in)	Incremental Inf. Rate (in/hr)
Presoak	12:10	-	12.00	-	-
	1:10	60	11.75	0.25	N/A
Test 1	0	-	6.00	-	-
	15	15	6.00	0.00	0.0
	30	15	5.88	0.12	0.5
	45	15	5.88	0.00	0.0
	60	15	5.75	0.13	0.5
			Test 1	Avg. Inf. Rate (in./hr.):	
Test 2	0	-	6.00	-	-
	15	15	6.00	0.00	0.0
	30	15	5.88	0.12	0.5
	45	15	5.88	0.00	0.0
	60	15	5.75	0.13	0.5
			Test 2	Avg. Inf. Rate (in./hr.):	
Test 3	0	-	6.00	-	-
	15	15	6.00	0.00	0.0
	30	15	5.88	0.12	0.5
	45	15	5.88	0.00	0.0
	60	15	5.75	0.13	0.5
			Test 3	Avg. Inf. Rate (in./hr.):	

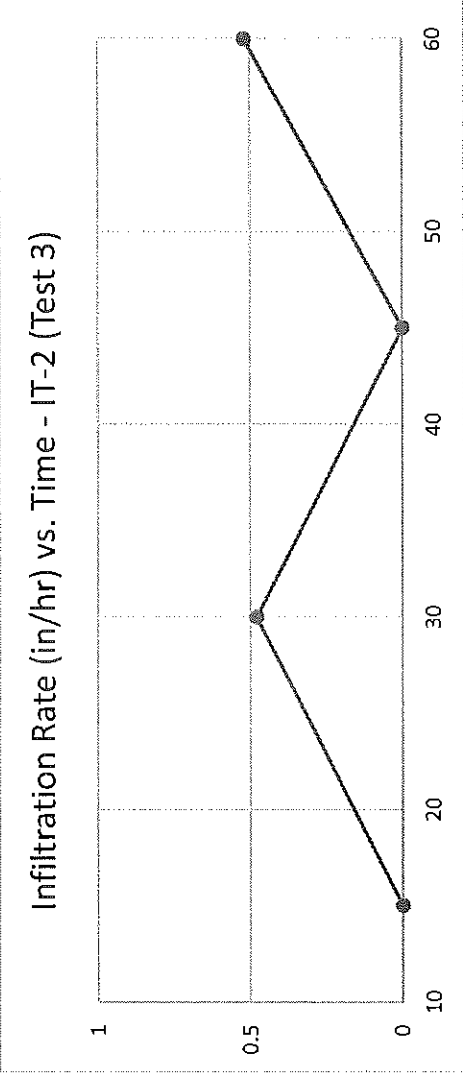
Tetra Tech-Bethany Beach
IT-2 Test 2

Interval #	Interval(min)	Cumulative Time	Rate(in/hr)
1	15	15	0
2	15	30	0.48
3	15	45	0
4	15	60	0.52



IT-2 Test 3

Interval #	Interval(min)	Cumulative Time	Rate(in/hr)
1	15	15	0
2	15	30	0.48
3	15	45	0
4	15	60	0.52



**Falling Head
Single Ring Infiltration Test
12 inch Ring**

Project: Tetra Tech-Bethany Beach

3/22/2022

Project No.: 10-22-131

Test Location: IT-3

Weather Sunny, 55

Depth of Ring Embedment: 3 in.

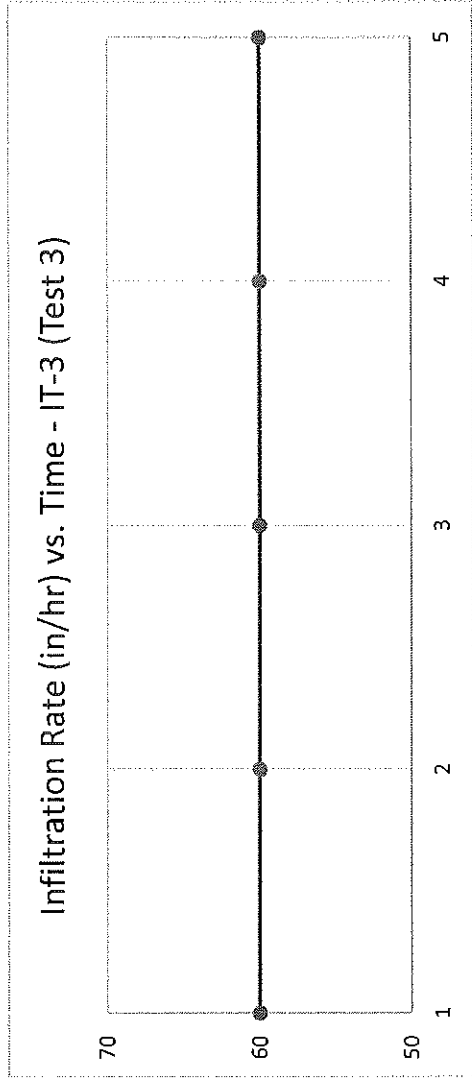
Test Depth: 8"

Tester/ Technician Performing Test: M. Hynes

	Time (t)	Time Elapsed (min)	Hydraulic Head (h) (in)	Change (Δh) (in)	Incremental Inf. Rate (in/hr)
Presoak	9:10	-	12.00	-	-
	9:25	15	0.00	12.00	N/A
Test 1	0	-	6.00	-	-
	1	1	5.00	1.00	60.0
	2	1	4.00	1.00	60.0
	3	1	3.00	1.00	60.0
	4	1	2.00	1.00	60.0
	5	1	1.00	1.00	60.0
	6	1	Dry	-	-
		Test 1	Avg. Inf. Rate (in./hr.):	60.0	
Test 2	0	-	6.00	-	-
	1	1	5.00	1.00	60.0
	2	1	4.00	1.00	60.0
	3	1	3.00	1.00	60.0
	4	1	2.00	1.00	60.0
	5	1	1.00	1.00	60.0
	6	1	Dry	-	-
		Test 2	Avg. Inf. Rate (in./hr.):	60.0	
Test 3	0	-	6.00	-	-
	1	1	5.00	1.00	60.0
	2	1	4.00	1.00	60.0
	3	1	3.00	1.00	60.0
	4	1	2.00	1.00	60.0
	5	1	1.00	1.00	60.0
	6	1	Dry	-	-
		Test 3	Avg. Inf. Rate (in./hr.):	60.0	
Test 4	0	-	6.00	-	-
	1	1	5.00	1.00	60.0
	2	1	4.00	1.00	60.0
	3	1	3.00	1.00	60.0
	4	1	2.00	1.00	60.0
	5	1	1.00	1.00	60.0
	6	1	Dry	-	-
		Test 4	Avg. Inf. Rate (in./hr.):	60.0	

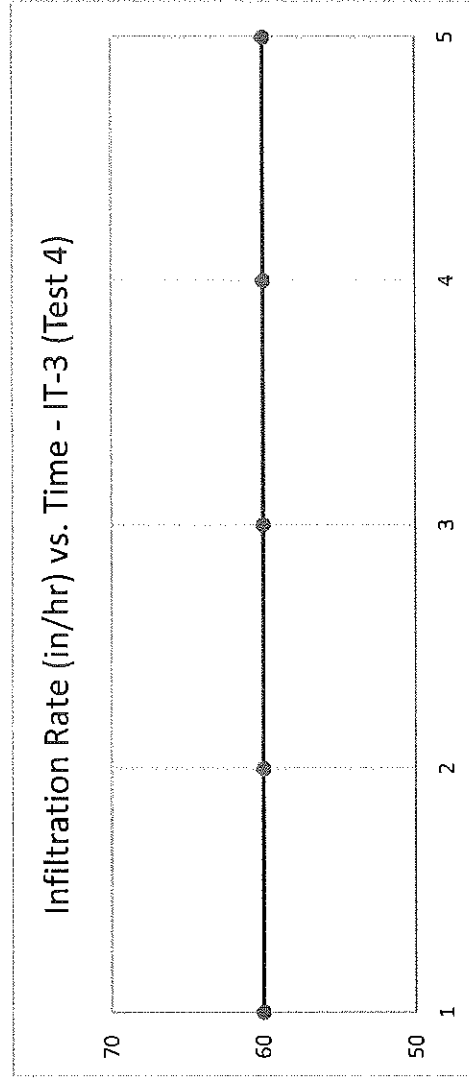
Tetra Tech-Bethany Beach
IT-3 Test 3

Interval #	Interval(min)	Cumulative Time	Rate(in/hr)
1	1	1	60
2	1	2	60
3	1	3	60
4	1	4	60
5	1	5	60



IT-3 Test 4

Interval #	Interval(min)	Cumulative Time	Rate(in/hr)
1	1	1	60
2	1	2	60
3	1	3	60
4	1	4	60
5	1	5	60



**Falling Head
Single Ring Infiltration Test
12 inch Ring**

Project: Tetra Tech-Bethany Beach

3/22/2022

Project No.: 10-22-131

Test Location: IT-4

Weather Sunny, 55

Depth of Ring Embedment: 3 in.

Test Depth: 14"

Tester/ Technician Performing Test: M. Hynes

	Time (t)	Time Elapsed (min)	Hydraulic Head (h) (in)	Change (Δh) (in)	Incremental Inf. Rate (in/hr)
Presoak	9:10	-	12.00	-	-
	9:25	15	0.00	12.00	N/A
Test 1	0	-	6.00	-	-
	1	1	5.00	1.00	60.0
	2	1	4.00	1.00	60.0
	3	1	3.38	0.63	37.5
	4	1	2.63	0.75	45.0
	5	1	2.00	0.63	37.5
	6	1	1.50	0.50	30.0
	7	1	0.88	0.63	37.5
	8	1	0.25	0.63	37.5
	9	1	Dry	-	-
		Test 1	Avg. Inf. Rate (in./hr.):	43.0	
Test 2	0	-	6.00	-	-
	1	1	5.00	1.00	60.0
	2	1	4.38	0.63	37.5
	3	1	3.88	0.50	30.0
	4	1	3.38	0.50	30.0
	5	1	2.88	0.50	30.0
	6	1	2.38	0.50	30.0
	7	1	2.00	0.38	22.5
	8	1	1.50	0.50	30.0
	9	1	1.00	0.50	30.0
	10	1	0.50	0.50	30.0
11	1	Dry	-	-	
		Test 2	Avg. Inf. Rate (in./hr.):	33.0	

**Falling Head
Single Ring Infiltration Test
12 inch Ring**

Project: Tetra Tech-Bethany Beach

3/22/2022

Project No.: 10-22-131

Test Location: IT-4

Weather Sunny, 55

Depth of Ring Embedment: 3 in.

Test Depth: 14"

Tester/ Technician Performing Test: M. Hynes

	Time (t)	Time Elapsed (min)	Hydraulic Head (h) (in)	Change (Δh) (in)	Incremental Inf. Rate (in/hr)
Test 3	0	-	6.00	-	-
	1	1	5.25	0.75	45.0
	2	1	4.50	0.75	45.0
	3	1	3.88	0.63	37.5
	4	1	3.38	0.50	30.0
	5	1	2.88	0.50	30.0
	6	1	2.50	0.38	22.5
	7	1	2.00	0.50	30.0
	8	1	1.63	0.38	22.5
	9	1	1.25	0.38	22.5
	10	1	0.75	0.50	30.0
	11	1	0.38	0.38	22.5
	12	1	0.25	0.13	7.5
	13	1	Dry	-	-
	Test 3		Avg. Inf. Rate (in./hr.):	28.8	
Test 4	0	-	6.00	-	-
	1	1	5.50	0.50	30.0
	2	1	5.00	0.50	30.0
	3	1	4.50	0.50	30.0
	4	1	4.00	0.50	30.0
	5	1	3.63	0.38	22.5
	6	1	3.25	0.38	22.5
	7	1	2.88	0.38	22.5
	8	1	2.50	0.38	22.5
	9	1	2.13	0.38	22.5
	10	1	1.75	0.38	22.5
	11	1	1.38	0.38	22.5
	12	1	1.00	0.38	22.5
	13	1	0.63	0.38	22.5
	14	1	0.25	0.38	22.5
	15	1	Dry	-	-
	Test 4		Avg. Inf. Rate (in./hr.):	24.6	

**Falling Head
Single Ring Infiltration Test
12 inch Ring**

Project: Tetra Tech-Bethany Beach

3/22/2022

Project No.: 10-22-131

Test Location: IT-4

Weather Sunny, 55

Depth of Ring Embedment: 3 in.

Test Depth: 14"

Tester/ Technician Performing Test: M. Hynes

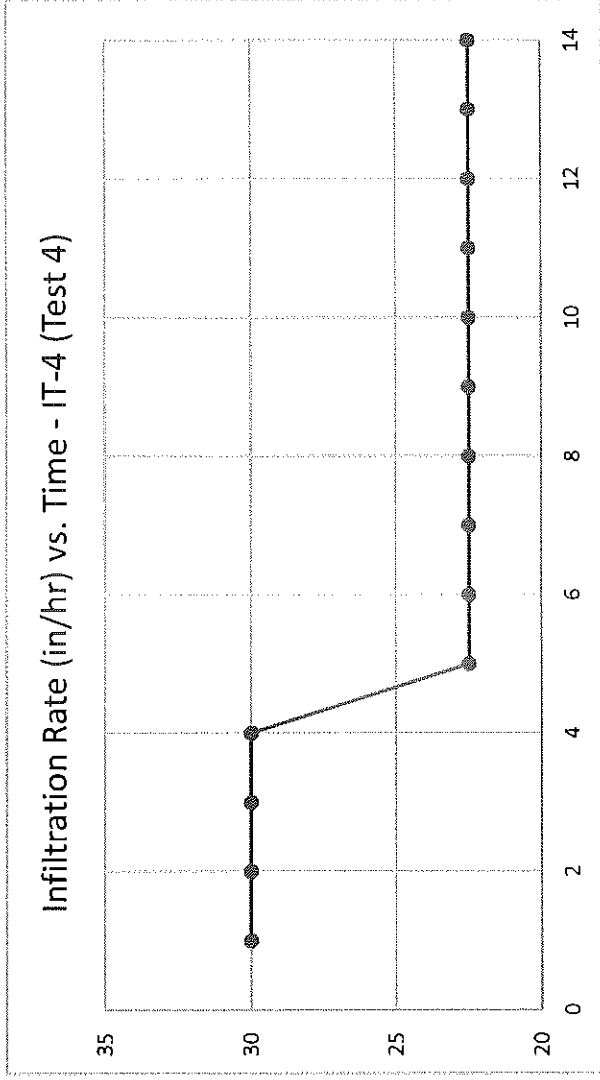
	Time (t)	Time Elapsed (min)	Hydraulic Head (h) (in)	Change (Δh) (in)	Incremental Inf. Rate (in/hr)
Test 5	0	-	6.00	-	-
	1	1	5.50	0.50	30.0
	2	1	5.00	0.50	30.0
	3	1	4.50	0.50	30.0
	4	1	4.00	0.50	30.0
	5	1	3.63	0.38	22.5
	6	1	3.25	0.38	22.5
	7	1	2.88	0.38	22.5
	8	1	2.38	0.50	30.0
	9	1	2.00	0.38	22.5
	10	1	1.63	0.38	22.5
	11	1	1.25	0.38	22.5
	12	1	0.88	0.38	22.5
	13	1	0.50	0.38	22.5
14	1	Dry	-	-	
	Test 5		Avg. Inf. Rate (in./hr.):	25.4	

Tetra Tech-Bethany Beach

IT-4 Test 4

Interval # Interval(min) Cumulative Time Rate(in/hr)

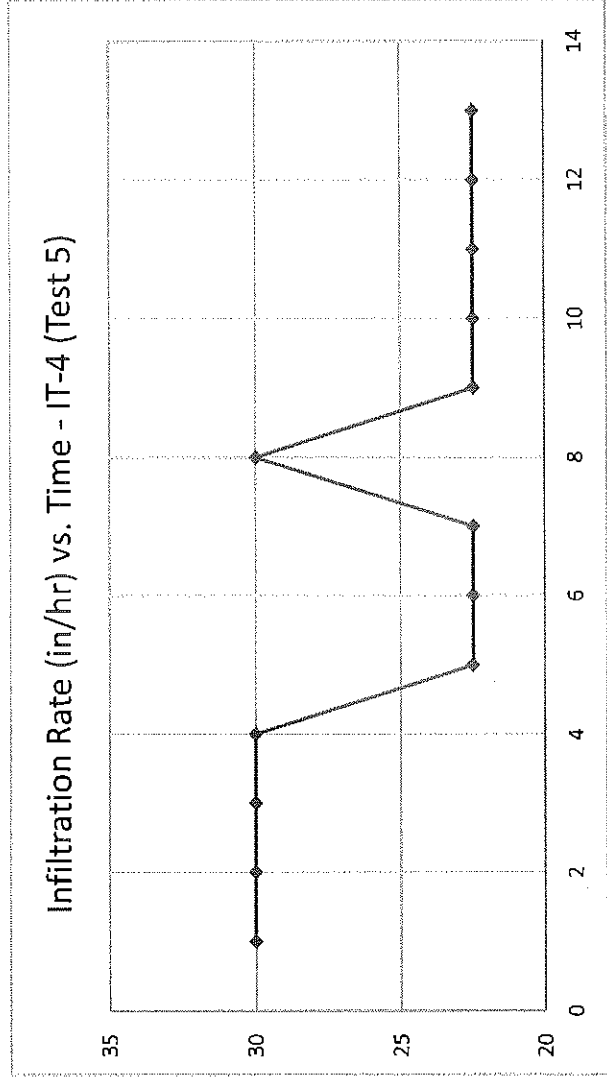
1	1	1	30
2	1	2	30
3	1	3	30
4	1	4	30
5	1	5	22.5
6	1	6	22.5
7	1	7	22.5
8	1	8	22.5
9	1	9	22.5
10	1	10	22.5
11	1	11	22.5
12	1	12	22.5
13	1	13	22.5
14	1	14	22.5



IT-4 Test 5

Interval # Interval(min) Cumulative Time Rate(in/hr)

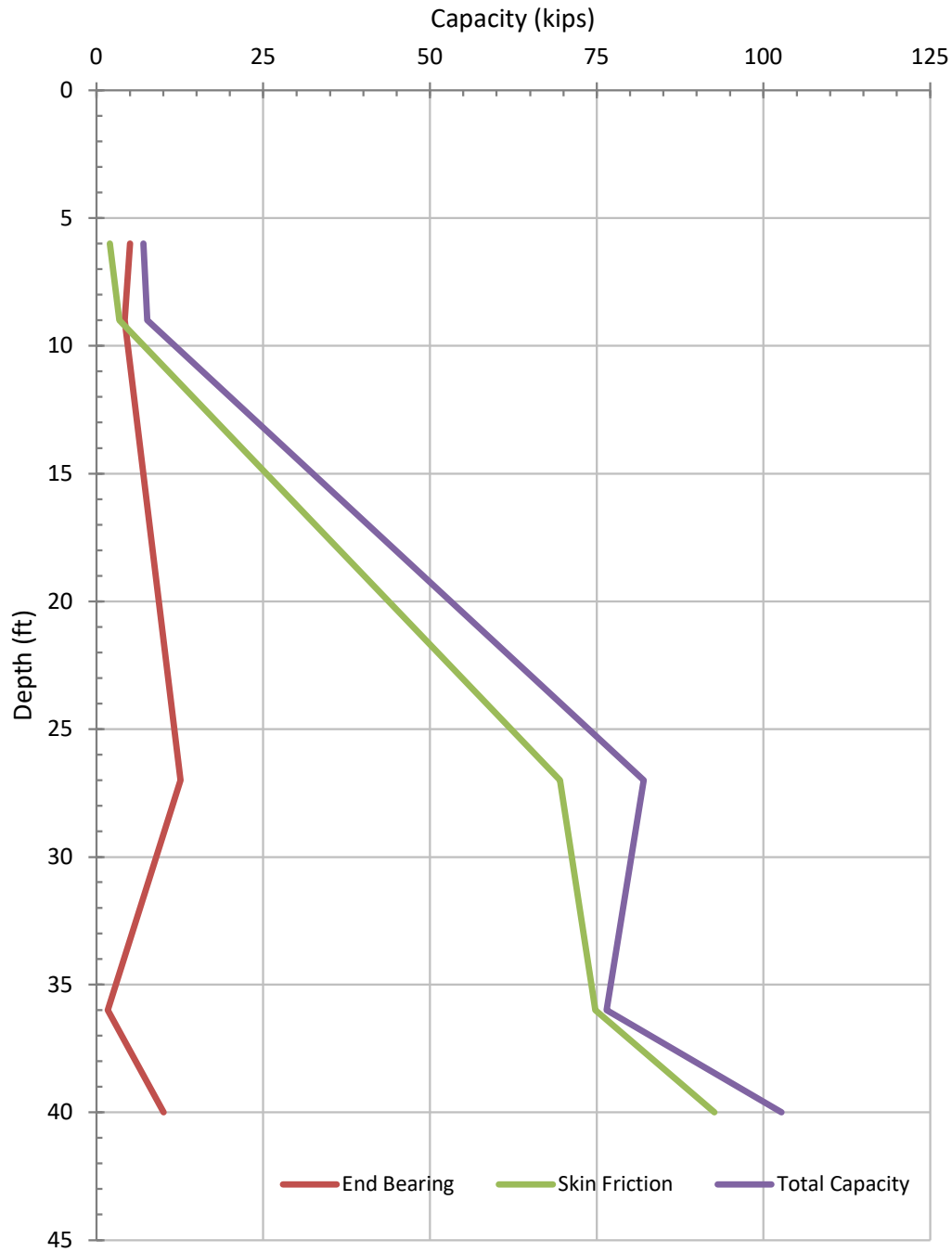
1	1	1	30
2	1	2	30
3	1	3	30
4	1	4	30
5	1	5	22.5
6	1	6	22.5
7	1	7	22.5
8	1	8	30
9	1	9	22.5
10	1	10	22.5
11	1	11	22.5
12	1	12	22.5
13	1	13	22.5



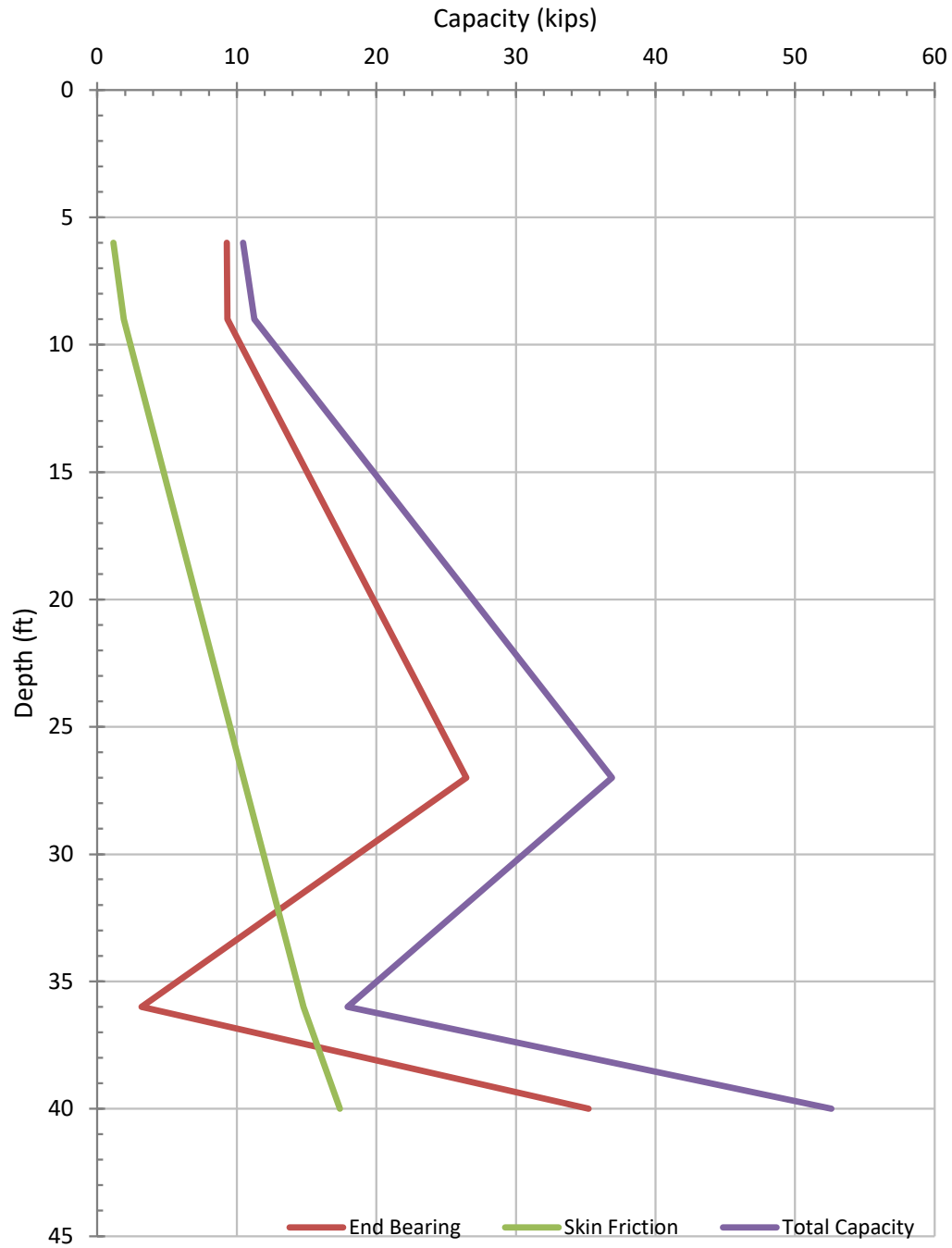
APPENDIX E

Pile Design Data and Figures

16" Auger Cast Pile Allowable Axial Capacity (FS=2)



16" Diameter Timber Pile Allowable Axial Capacity (FS=2)



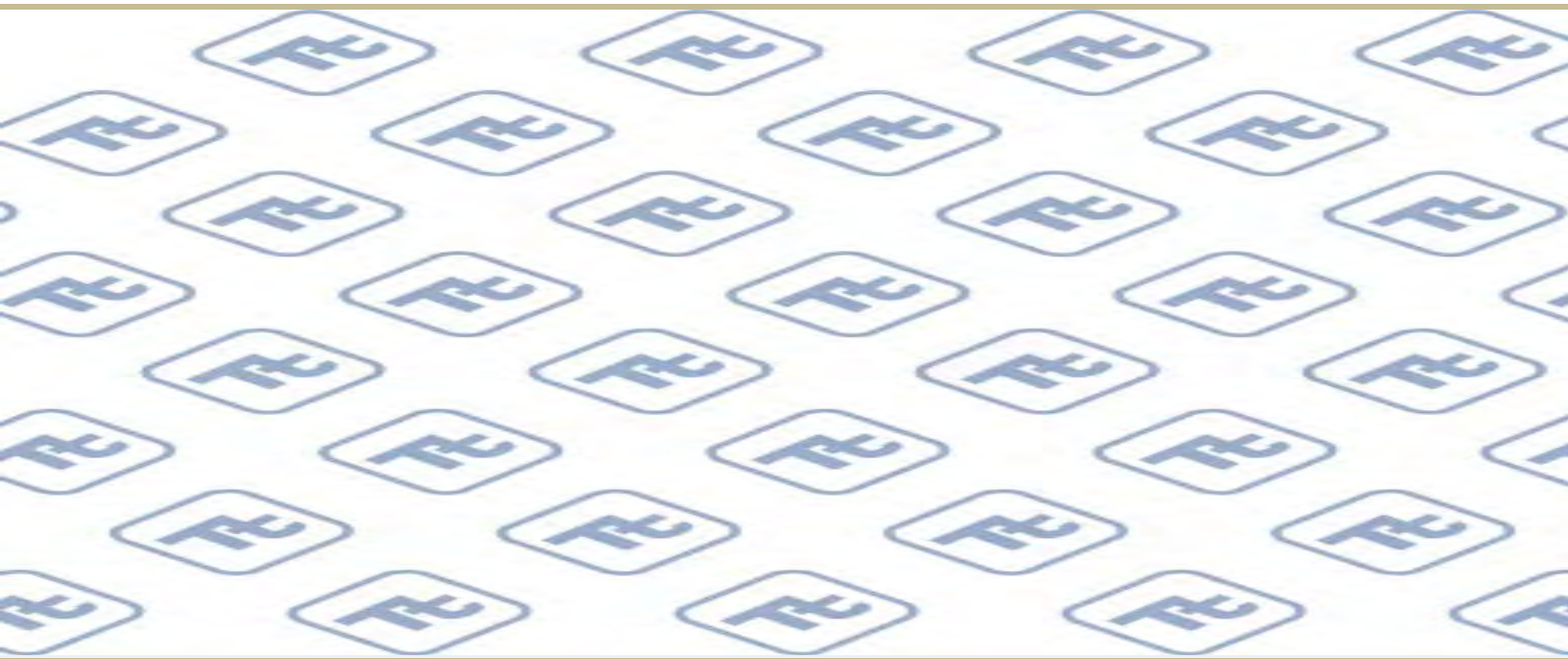


TETRA TECH

Geotechnical Subsurface Investigation Report

POTENTIAL FUTURE TRAINING BARRACK SITES

Delaware Army National Guard
163 Scannell Boulevard
Bethany Beach, Delaware



Prepared for:

DEARNG/FMO
1 Vavala Way
New Castle, DE 19720

103IG8287

June 2022

Geotechnical Subsurface Investigation Report

Potential Future Training Barrack Sites

Delaware Army National Guard
163 Scannell Boulevard
Bethany Beach, Delaware

PRESENTED TO

DEARNG/FMO

1 Vavala Way
New Castle, DE 19720

PRESENTED BY

Tetra Tech, Inc.

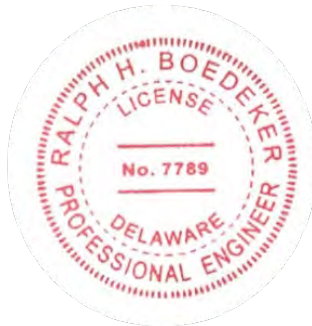
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1.0 INTRODUCTION

This report presents results of a geotechnical subsurface investigation pertaining to two potential future training barrack locations (the Site) at the Bethany Beach Delaware Army National Guard (DEARNG), Bethany Beach, Delaware. Purposes of this study were to investigate subsurface conditions within the Site, formulate foundation design criteria for proposed development of the Site, and offer pertinent geotechnical recommendations for construction at the Site.

This geotechnical study evaluated subsurface conditions within the Site, and the report offers recommendations based on an exploration of subsurface soil conditions by means of Standard Penetration Test (SPT) Borings (ASTM International [ASTM] D1586). The scope of this investigation included a test boring program, laboratory testing of representative soil samples, engineering evaluation of the available data, and preparation of this engineering report. These services proceeded under supervision of a professional geotechnical engineer registered in the State of Delaware.

2.0 DESCRIPTIONS, INVESTIGATIONS, AND SUBSURFACE CONDITIONS

The following sections include a site description and discussions regarding (1) proposed development of the facility, (2) the geotechnical subsurface investigation program, (3) subsurface conditions, and (4) regional geology.

2.1 General Site Description and Proposed Facility Development

The Site is within the DEARNG BBTS facility at 163 Scannell Boulevard, Bethany Beach, Delaware. Proposed locations of potential future training barracks are depicted in Appendix A – Locations A and B. Both locations are relatively flat and developed with lawns and minor landscaping. Three aboveground propane storage tanks (and associated underground utilities) are within the Location B area.

For evaluation purposes, we have assumed that the barrack buildings will be constructed of either load bearing concrete masonry unit (CMU) walls or steel framing with non-load bearing CMU wall infill, with the following estimated design loads (dead load plus live load):

- Maximum column load: 70 kips (steel framing construction)
- Minimum wall loads: 10 kips per lineal foot (CMU load bearing wall construction).

If actual design values vary appreciably from the above values, Tetra Tech should be notified to determine if additional analyses are warranted.

We also have assumed that finished floor elevations of proposed barracks will be at or near existing site grades.

2.2 Geotechnical Subsurface Investigation Program

On May 19, 2022, to collect representative soil samples and identify conditions of subsurface soil and groundwater, three SPT exploratory soil borings were advanced at each of the two barracks locations to 20 feet below ground surface (bgs)—total of six borings (SB-01 through SB-06). Approximate boring locations are depicted in Appendix A. Advancements of borings proceeded by use of trailer-mounted drilling rigs. SPT split-spoon samples (ASTM D1586) were collected continuously from each boring to depth of 10 feet, and thereafter at 5-foot intervals. In the SPT procedure, a 2-inch-outside diameter (O.D.) split-barrel sampler is driven into the soil a distance of 18 or 24 inches by a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler from the 6- to 18-inch interval is termed the Standard Penetration Resistance (SPR) N-value. This value can serve as a qualitative indication of

in-place relative density of cohesionless (e.g., granular) soils. It is also a secondary indicator of consistency of cohesive soils. Gravel, cobbles, and boulders may induce high blow counts not representative of the soil's relative density/consistency. This indication is qualitative because many factors can significantly affect the SPR value (i.e., drilling crew procedures, drill rigs, and hammer-rod assemblies, etc.).

A Tetra Tech geotechnical staff engineer reviewed performances of the test borings. Test boring logs (Appendix B) include soil and groundwater data obtained from the explorations. Pocket penetrometer field-index testing was conducted on collected cohesive split-spoon soil samples to estimate shear strength characteristics; these test results were recorded in the boring logs. After completion of the test borings, they were backfilled with the auger soil cuttings. Topographic information was not available to approximate surface elevations at boring locations.

All soil samples collected during this investigation were reviewed and described visually in Tetra Tech's geotechnical laboratory. Representative soil samples collected from the soil boring program were selected for geotechnical laboratory testing. Twenty Water Content Tests (ASTM: D2216) and Percent Finer than a No. 200 Sieve Tests (ASTM: D1140) were performed to assist in determining the general site stratigraphy, and to measure the amount of silt and clay particulate in the soil samples. One Atterberg Limit Test (ASTM D4318) was conducted to aid in classification of encountered cohesive soils. Results of the grain-size analysis and Atterberg Limits testing were referenced to determine the Unified Soil Classification System (USCS) designation for the soils encountered, which provided information regarding soil engineering behavior. A summary of the laboratory testing results appears in Appendix C. Soil samples collected during this investigation will be retained for a period of 2 months, after which they will be discarded unless further instructions are received regarding their disposition.

2.3 Subsurface Conditions

Subsurface conditions throughout the two investigation areas can be described generally as a series of alluvial deposits varying in thickness, gradation, and density. Subsurface conditions encountered at boring locations are described in detail in the test boring logs (Appendix B). Subsurface conditions between boring locations were interpolated, and may not reflect actual conditions. Generalized descriptions of the various subsurface soil strata encountered at both Locations A and B are as follows:

- Topsoil: A surficial topsoil/root mat layer ranging in thickness from approximately 6 to 8 inches was encountered at boring locations. Thicker and/or thinner layers of topsoil may be encountered at other areas of the properties, away from boring locations.

- Stratum A –Coarse-Grained Soils: Encountered beneath the topsoil at each boring location, Stratum A can be described generally as a brown fine to medium sand, trace fine to coarse gravel, with variable amounts of silt (USCS: SM, visual). Depth to which Stratum A was encountered ranged from 1.8 to 2.0 feet bgs. SPR values within Stratum A ranged from 8 to 27 blows per final foot of spoon penetration, with an average SPR value of 13 blows, indicating a medium dense relative density. Laboratory and field SPR test data indicate that the granular soils of Stratum B have relatively moderate shear strength and low compressibility characteristics.
- Stratum B – Alluvial Coarse-Grained Organic Soils: Underlying Strata A, Stratum B was encountered at each of the boring locations and can be described generally as a dark brown fine to medium sand with some apparent organic silt (USCS: SM, organic, visual). Thickness of Stratum B ranged from 0.5 to 2.5 feet. SPR values within Stratum B ranged from 2 to 10 blows per final foot of spoon penetration, with an average SPR value of 6 blows, indicating a loose relative density. Laboratory and field SPR test data indicate that the granular soils of Stratum B have relatively low shear strength and potentially high compressibility characteristics due to presence of organics.
- Stratum C – Alluvial Coarse-Grained Soils: Underlying Stratum B, Stratum C was encountered at each of the boring locations and can be described generally as a variable matrix of grayish brown to gray, fine to fine to medium sand, with varying amounts of silt and clay (USCS: SP, SP-SM, SM, SC, visual). Each of the borings terminated within Stratum C. SPR values within Stratum C ranged from 3 to 29 blows per final foot of spoon penetration, with an average SPR value of 12 blows, indicating a medium dense relative density. Laboratory and field SPR test data indicate that the granular soils of Stratum B have relatively moderate shear strength and low compressibility characteristics.
- Stratum C1 – Seam of Alluvial Fine-Grained Soils: Stratum C1 is a clay seam encountered within Stratum C at boring location SB-06. The seam can be described generally as a gray silty clay with a trace to a little fine sand (USCS: CL). Thickness of Stratum C1 at SB-06 was approximately 5 feet. The SPR value encountered within the clay was 6 blows per final foot of spoon penetration, indicating a soft to medium stiff consistency.

Apparent groundwater was encountered within each of the soil borings at approximately 2 feet bgs. Groundwater elevations fluctuate throughout a given year, depending on actual field porosity and variations in seasonal and annual precipitation. Variations in groundwater levels several feet higher or lower than those observed during this evaluation could occur.

2.4 Regional Geology and Groundwater

Generalized Regional Geology

The Site is within the Atlantic Coastal Plain physiographic province. Delaware Geologic Survey (DGS) mapping shows that the Site is underlain by two major geological units, the Omar Formation (Pleistocene Age) and underlying Beaverdam Formation (Miocene to late Pliocene Age). The Omar Formation generally consists of gray clayey-sand to sandy-silt that contains shell fragments. Scattered beds of fine sand and silty fine sand are common. The underlying Beaverdam Formation generally consists of fine to coarse sand with interbeds of fine silty sand and clayey-silt. Depth to bedrock in the general site area is on the order of 2,500 feet below surface grade.

Regional Groundwater

Tetra Tech reviewed the Delaware Geologic Information Resource (DGIR) to reference “normal year” and “wet year” water table mapping in the area of the Site. According to normal year water table mapping, depth to groundwater across the Site typically is less than 3 feet bgs. According to wet year water table mapping, depth to groundwater across the Site is also less than 3 feet bgs

3.0 GEOTECHNICAL EVALUATION AND DESIGN RECOMMENDATIONS

Tetra Tech evaluated subsurface conditions at the Site for suitability of the proposed site development. Tetra Tech's opinion is that subsurface conditions at the Site are suitable for placement of the proposed structures on a shallow foundation system and floor slab, within certain limitations. The following sections discuss design of building foundations and other aspects of the proposed site development that would be influenced by geotechnical conditions. Recommendations regarding general site construction are offered in Section 4.0.

3.1 *Shallow Foundation Systems*

The loose and organic soils of Stratum B are considered not suitable for direct support of building foundations. Where encountered, all Stratum B soils lying below proposed footings should be completely removed (undercut)—depth of the undercut should extend through the Stratum B soils to encounter with and verification of a firm and stable subgrade. The undercut should extend a distance of 0.5 x width of footing on each side of the footing for all continuous wall footings, and should extend 1 foot beyond the footing perimeter for shallow spread footings. Backfilling within these excavated dimensions should then occur with compacted American Association of State Highway and Transportation Officials (AASHTO) No. 57 stone (wrapped with a non-woven geotextile fabric [Geotex 601 or equivalent]) for immediate support below the footings. Alternatively, footings can merely extend through the Stratum B soils and rest directly on a verified firm and stable subgrade. Refer to Section 3.4 for discussion regarding encounter with groundwater during foundation construction.

An engineering analysis indicated that design of shallow-spread and continuous foundations for the potential future barracks locations should presume a maximum allowable soil bearing pressure of 2,000 pounds per square foot (psf)—based on (1) information conveyed above, (2) results of field and laboratory testing of soils encountered during this evaluation, and (3) foundation loading information we assumed.

Assuming an allowable bearing capacity of 2,000 psf, we estimate that the maximum total settlement of column spread foundations, and differential settlement between columns, will be less than 1.0 and 0.5 inch, respectively. Assuming an allowable bearing capacity of 2,000 psf, we estimate that maximum total settlement of continuous wall footings will be less than 1.0, and differential settlement of less than 0.5 inch over a distance of 25 feet. Because of the encountered subsurface granular soils and the generally semi-solid condition of subsurface cohesive soils (where present), an estimated 75% of dead-load induced settlement is expected to occur quickly (elastic settlement), and is expected to be “built out”

during construction. Generally, the above magnitudes of total and differential settlement are considered within tolerable limits for the structures planned for the Site. However, the project's structural engineer should verify the settlement tolerance of each proposed building.

The base of exterior footings exposed to freezing conditions should be placed at least 24 inches below final exterior grades. Interior footings in insulated areas should be placed at least 18 inches below the proposed finished floor elevation. Shallow-spread and continuous footings should have minimum widths of 3.0 and 2.0 feet, respectively, regardless of bearing pressure.

Masonry walls should be provided with frequent control joints at architecturally convenient locations, to provide preferred locations for differential settlements.

3.2 *Ground-Supported Floor Slabs*

All ground-supported floor slabs should be designed as free-floating and not connected to other structural elements. The slab may bear on footing projections, but isolation joints should be utilized to accommodate potential differential settlement between the floor slab and adjacent columns or walls. Control joints should also be provided in floor slabs, as required, to provide a preferred location for possible differential slab settlement. All floor slabs should be structurally reinforced to control cracking, more evenly distribute applied loads, and bridge localized zones of lower density material. Tetra Tech also recommends placement of a minimum 4 inches of poorly graded, free draining stone aggregate (e.g., AASHTO No. 57 Stone) under all floor slabs to provide a uniform bearing surface with all-weather support, and to serve as a capillary break. To preclude floor dampness, placement of a minimum 0.01-inch (10-mil) polyethylene membrane or equivalent vapor barrier beneath the floor slab is recommended.

Actual stress distribution and settlement response under the floor slabs will be a function of the structural rigidity of the slab and uniformity of applied loads. To avoid localized cracking of the floor slab, individual equipment, machinery, and tanks should be supported on their own foundations and isolated from the floor slab.

For floor slabs installed as recommended herein, Tetra Tech estimates a modulus of subgrade reaction (Ks) of 150 pounds per cubic inch (pci) for use in concrete slab-on-grade design.

3.3 Seismic Design

Based on subsurface conditions encountered during the test boring program and review of regional geologic maps, Tetra Tech recommends utilization of a site Class E for seismic design purposes. The site class definition is in Section 1613 of the International Building Code.

3.4 Groundwater

Based on measured groundwater depths and assumption that finished floor elevations will be at or near existing site grades, encounter with groundwater is likely during construction of foundations and underground utilities. Apparent groundwater was encountered within each of the soil borings at approximately 2 feet bgs. The awarded contractor should be prepared to conduct dewatering activities if groundwater is encountered within site excavations. The contractor should be prepared to dewater excavations at least 2 feet below anticipated foundation base elevations and/or below potential undercut zones within which removal of unsuitable soils would occur.

Groundwater elevations fluctuate throughout a given year, depending on actual field porosity and variations in seasonal and annual precipitation. Variations in groundwater levels several feet higher or lower than those observed during this evaluation could occur.

3.5 *Underground Utilities*

Any existing underground utilities within the proposed building areas should be relocated outside of the foundation and slab footprint to allow future servicing of those utilities, and to eliminate concern about damage to utilities during construction. Details should appear on the structural drawings and foundation plans to address utilities that cross footing lines, such as stepping the foundation bearing levels below the utilities, or providing lintels or casings for “live” lines. “Dead” utilities should be removed or abandoned in-place by filling the conduit or pipe with grout or flowable fill. However, Tetra Tech recommends removal and replacement of trench backfill even if the pipe remains in-situ because of the unknown quality and density of the utility trench backfill material.

4.0 GENERAL CONSTRUCTION RECOMMENDATIONS

The following sections discuss preparation of the Site, engineered fill, foundation construction, and quality control and quality assurance of site work.

4.1 *Site Preparation*

At start of construction, all pavements, topsoil, vegetation, roots, trees and tree root balls should be entirely removed from all proposed bulk grading areas. Prior to placement of engineered fill in building “fill” areas, the subgrade of fill areas should be proof-rolled with a minimum 15-ton roller in the presence of a qualified soils technician. Proof-rolling will increase density of exposed subgrade areas that will have been loosened or disturbed during stripping and clearing operations. Proof-rolling also will expose potential localized soft and yielding areas. The exposed surfaces should be compacted to a visually firm and stable condition. Subgrade compaction will facilitate placement and compacting of engineered fill at the required densities. Proof-rolling should also occur at final “cut” or “at grade” areas (building and pavement areas) to ensure a firm and stable subgrade. Any localized soft and unstable areas encountered during the proof-rolling program that cannot be adequately stabilized and compacted should be undercut and replaced via procedures discussed in Section 4.2.

Soil subgrade disturbance should be minimized by providing positive surface drainage and limiting construction traffic on exposed subgrade soils. Subgrade soils within proposed building and pavement areas disturbed by precipitation and construction traffic should be either (1) scarified, dried, and re-compacted; or (2) undercut and replaced with engineered fill.

4.2 *Engineered Fill*

Engineered fill required to bring structural building and pavement areas to grade should be free of organic material, topsoil, debris, and gravel exceeding 3 inches in largest dimension. Engineered fill should also be used to backfill foundation excavations and utility trenches within building and pavement areas.

The granular soils of Strata A and C are considered suitable for use as engineered fill. The potentially organic soils of Stratum B are considered not suitable for use as engineered fill. Imported borrow material should meet the USCS classifications of SW, SM, SC, or GW, with no more than 25% passing a No. 200 sieve test (ASTM D1140), and a plasticity index (ASTM D4318) not exceeding 6.

Engineered fill material should be placed in horizontal thin lifts with a compacted thickness no greater than 8 inches. Engineered fill lifts for hand tampers should not exceed 4 inches. Each thin lift of fill/backfill

material placed below structural elements (i.e., foundations and floor slabs) and pavements should be compacted according to the following criteria:

- Within proposed building areas (defined as the area extending at least 3 feet beyond foundation element perimeters) and utility trenches within building areas: compaction should be to at least 95% of maximum dry density, as determined by the Modified Proctor Test (ASTM D1557).
- Within proposed pavement areas and utility trenches within pavement areas: compaction should be to at least 90% of maximum dry density, as determined by the Modified Proctor Test (ASTM D1557).

Engineered fill should be placed at moisture contents that facilitate compaction (typically at +/- 2-3% of optimum moisture, per ASTM D1557). A qualified geotechnical technician should monitor and test placement and compaction of engineered fill.

4.3 Shallow Foundation Construction

All foundations should be placed on dry, non-frozen, firm soil. When excessively soft, wet, or frozen soil is encountered at the foundation base, this material should be undercut to suitable bearing materials. The undercut zone may be replaced in accordance with engineered fill recommendations. AASHTO No. 57 Stone could also be used as backfill within foundation undercut zones—placed in maximum 12-inch lifts and compacted by use of a vibratory plate compactor.

During excavation of foundations, disturbance of subgrade soils is possible; therefore, compaction of the foundation subgrades should occur prior to placement of any reinforcing steel or concrete. Foundation subgrade undercutting will be required at both potential barrack locations to remove unsuitable soils, as described in Section 3.1. All foundation excavations should be reviewed to verify the quality of the bearing material—by a qualified geotechnical technician working under the supervision of a geotechnical engineer familiar with the recommendations of this report. Subgrade review should occur prior to placement of reinforcing steel or concrete, and should verify presence of suitable bearing soils.

All foundation excavations should be protected from ponding water and freezing conditions, and backfilled as soon as practical after placement of the foundation concrete. Backfilling should accord with recommendations regarding engineered fill compaction offered in Section 4.2.

Refer to Section 3.4 for discussion regarding encounter with groundwater during foundation construction.

4.4 Excavation Safety

All utility and foundation excavation should accord with Occupational Safety and Health Administration (OSHA) guidelines.

4.5 Site Work Quality Control and Assurance

All site clearing, grading, proofrolling, fill placement, and foundation construction should be monitored by a qualified geotechnical technician working under supervision of a geotechnical engineer. Typically, the owner retains the project geotechnical engineer to conduct third-party inspection or construction monitoring services. The technician should observe and document site preparation and proof-rolling, engineered fill construction, foundation subgrades, and foundation construction—and should conduct appropriate field tests, as necessary, to verify that construction proceeds in accordance with applicable plans, specifications, and acceptable construction practice. Conclusions and recommendations in this report are based on the premise of competent field engineering and monitoring during construction.

5.0 REPRESENTATIONS

Preparation of this report accorded with generally accepted engineering principles and practices, and was based on soil and groundwater conditions encountered during the field exploration. No warranty is expressed or implied. Although generalized subsurface conditions have been inferred through interpolation and/or extrapolation of acquired field and laboratory data, actual subsurface conditions between soil boring locations are unknown. As a result, recommendations in this report may require modifications based on subsurface conditions actually encountered during construction. Tetra Tech should be notified if conditions encountered during construction differ from those indicated by test borings, thus possibly requiring re-evaluation of recommendations offered in this report. This report applies solely to size, type, and location of the structure described herein. If changes are proposed, this report will not be considered valid unless and until Tetra Tech has reviewed the changes and accordingly altered and re-approved recommendations of this report.

Construction bidders should familiarize themselves thoroughly with on-site subsurface soil and groundwater conditions described herein. Tetra Tech recommends provision of this report to bidding contractors so they can develop their own interpretations of the available data. Tetra Tech, DEARNG, and the State of Delaware assume no responsibility for interpretation or deductions by the awarded contractor based on information in this report. Variations in subsurface conditions are expected.

APPENDIX A

Potential Barrack and Test Boring Locations



SB-02

SB-01

SB-03

SB-04

SB-05

SB-06

B

APPENDIX B

Test Boring Logs

FIELD DESCRIPTION AND LOGGING SYSTEM FOR SOIL EXPLORATION

GRANULAR SOILS

(Sand, Gravel & Combinations)

<u>Density</u>	<u>N (blows)*</u>
Very Loose	5 or less
Loose	6 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	51 or more

Particle Size Identification

Boulders	8 in. diameter or more
Cobbles	3 to 8 in. diameter
Gravel	Coarse (C) 3 in. to ¾ in. sieve
	Fine (F) ¾ in. to No. 4 sieve
Sand	Coarse (C) No. 4 to No. 10 sieve (4.75mm-2.00mm)
	Medium (M) No. 10 to No. 40 sieve (2.00mm – 0.425mm)
	Fine (F) No. 40 to No. 200 sieve (0.425 – 0.074mm)
Silt/Clay	Less Than a No. 200 sieve (<0.074mm)

Relative Proportions

<u>Description Term</u>	<u>Percent</u>
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS

(Silt, Clay & Combinations)

<u>Consistency</u>	<u>N (blows)*</u>
Very Soft	3 or less
Soft	4 to 5
Medium Stiff	6 to 10
Stiff	11 to 15
Very Stiff	16 to 30
Hard	31 or more

Plasticity

<u>Degree of Plasticity</u>	<u>Plasticity Index</u>
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	> 22

ROCK

(Rock Cores)

<u>Rock Quality Designation (RQD), %</u>	<u>Rock Quality Description</u>
0-25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

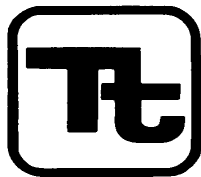
RQD: Rock Quality Designation

TCR: Total Core Recovery

SCR: Solid Core Recovery

***N - Standard Penetration Resistance.** Driving a 2.0" O.D., 1-3/8" I.D. sampler a distance of 18 inches into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. The number of hammer blows to drive the sampler through each 6 inch interval is recorded; the number of blows required to drive the sampler through the final 12 inch interval is termed the Standard Penetration Resistance (SPR) N-value. For example, blow counts of 6/8/9 (through three 6-inch intervals) results in an SPR N-value of 17 (8+9).

Groundwater observations were made at the times indicated. Groundwater elevations fluctuate throughout a given year, depending on actual field porosity and variations in seasonal and annual precipitation.



TETRA TECH

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TEST BORING LOG

Project Name:	POTENTIAL FUTURE BARRACKS (LOCATIONS A & B)	Project No.:	103IG8287
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-01	Dates(s) Drilled:	05/19/22
Surface Elev.:		Inspector:	S. MCCOY
Drilling Contractor:	JD Hynes & Assoc	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	2.3
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.7			APPARENT TOPSOIL (8")						
1	0.0	2.0	0.7			A (SM)	BROWN FINE TO MEDIUM SAND WITH SOME SILT, TRACE FINE TO COARSE GRAVEL. CONTAINS 2" GRAVEL SEAM.	3	12	15	4	27	
2	2.0	4.0	1.8	2.5		B (SM)	DARK BROWN FINE TO MEDIUM SAND WITH SOME ORGANIC SILT.	5	6	4	4	10	
			2.5			C (SP)	GRAYISH BROWN FINE TO MEDIUM SAND.						
3	4.0	6.0				C (SP)	GRAYISH BROWN FINE SAND.	2	2	4	6	6	
4	6.0	8.0				C (SP-SM)	GRAYISH BROWN FINE TO MEDIUM SAND, LITTLE SILT, TRACE FINE GRAVEL.	5	8	11	13	19	
5	8.0	10.0				C (SM)	GRAYISH BROWN FINE SAND, SOME SILT.	5	5	9	11	14	
6	13.0	15.0				C (SM)	GRAYISH BROWN FINE SAND, SOME SILT.	5	6	8	10	14	
7	18.0	20.0		20.0		C (SM)	GRAYISH BROWN FINE SAND, SOME SILT.	2	3	5	7	8	
							WET ON SPOON AT 2.3'.						
							WATER LEVEL THROUGH AUGERS AT 3'.						
							CAVED AT 1.5'.						

Notes/Comments:
Pocket Penetrometer Testing

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



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TEST BORING LOG

Project Name:	POTENTIAL FUTURE BARRACKS (LOCATIONS A & B)	Project No.:	103IG8287
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-02	Dates(s) Drilled:	05/19/22
Surface Elev.:		Inspector:	S. MCCOY
Drilling Contractor:	JD Hynes & Assoc	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	2.0
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.5			APPARENT TOPSOIL (6")						
1	0.0	2.0	0.5			A (SM)	BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT, TRACE FINE TO COARSE GRAVEL.	3	6	6	10	12	
2	2.0	4.0	1.8	2.4		B (SM)	DARK BROWN FINE TO MEDIUM SAND WITH SOME ORGANIC SILT.	3	4	5	6	9	
			2.4			C (SP)	GRAYISH BROWN FINE SAND.						
3	4.0	6.0				C (SP-SM)	GRAYISH BROWN FINE SAND.	6	7	7	8	14	
4	6.0	8.0				C (SP-SM)	GRAYISH BROWN FINE SAND.	5	6	8	6	14	
5	8.0	10.0				C (SM)	GRAYISH BROWN FINE SAND WITH A LITTLE SILT.	2	4	6	12	10	
6	13.0	15.0				C (SM)	GRAYISH BROWN FINE SAND WITH A LITTLE SILT.	5	4	8	8	12	
7	18.0	20.0		20.0		C (SM)	GRAYISH BROWN FINE SAND WITH A LITTLE SILT.	3	12	16	17	28	
							WET ON SPOON AT 2.3'.						
							WATER LEVEL THROUGH AUGERS AT 2'.						
							CAVED AT 1.5'.						

Notes/Comments:
Pocket Penetrometer Testing

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



TETRA TECH

240 Continental Drive, Suite 200
 Newark, Delaware 19713
 302.738.7551
 fax: 302.454.5988

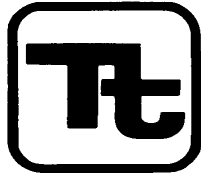
TEST BORING LOG

Project Name:	POTENTIAL FUTURE BARRACKS (LOCATIONS A & B)	Project No.:	103IG8287
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-03	Dates(s) Drilled:	05/19/22
Surface Elev.:		Inspector:	S. MCCOY
Drilling Contractor:	JD Hynes & Assoc	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	2.3
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.7			APPARENT TOPSOIL (8")						
1	0.0	2.0	0.7			A (SM)	BROWN FINE TO COARSE SAND WITH A LITTLE SILT.	4	4	4	8	8	
2	2.0	4.0	1.8	2.5		B (SM)	DARK BROWN FINE TO MEDIUM SAND WITH SOME ORGANIC SILT.	3	3	4	1	7	
			2.5			C (SP)	GRAY FINE SAND.						
3	4.0	6.0				C (SM)	GRAY FINE TO MEDIUM SAND WITH A LITTLE SILT.	2	4	8	7	12	
4	6.0	8.0				C (SC)	GRAYISH BROWN FINE SAND AND SILTY CLAY	4	3	3	4	6	
5	8.0	10.0				C (SM)	GRAYISH BROWN FINE SAND AND SILT.	5	5	8	8	13	
6	13.0	15.0					GRAY FINE SAND WITH A LITTLE SILT.	3	7	8	7	15	
7	18.0	20.0		20.0			GRAY FINE SAND WITH A LITTLE SILT.	3	4	7	4	11	
							WET ON SPOON AT 2.3'.						
							WATER LEVEL THROUGH AUGERS AT 3'.						
							CAVED AT 2.0'.						

Notes/Comments:
Pocket Penetrometer Testing
 S6: 1.75 TSF

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



TETRA TECH

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 Newark, Delaware 19713
 302.738.7551
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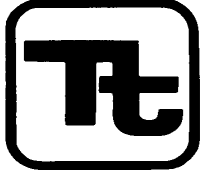
TEST BORING LOG

Project Name:	POTENTIAL FUTURE BARRACKS (LOCATIONS A & B)	Project No.:	103IG8287
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-05	Dates(s) Drilled:	05/19/22
Surface Elev.:		Inspector:	S. MCCOY
Drilling Contractor:	JD Hynes & Assoc	Drilling Method:	SPT - ASTM D1586
		Driller:	B. WALTERS
		Groundwater Depth (ft):	2.3
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.7			APPARENT TOPSOIL (8")						
1	0.0	2.0	0.7			A (SM)	BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT.	3	5	5	2	10	
2	2.0	4.0	2.0			B (SM)	DARK BROWN FINE TO MEDIUM SAND WITH SOME ORGANIC SILT.	2	1	1	1	2	
3	4.0	6.0	4.5			C (SM)	GRAYISH BROWN FINE TO MEDIUM SAND, LITTLE SILT.	1	1	2	6	3	
4	6.0	8.0					GRAYISH BROWN FINE TO MEDIUM SAND, LITTLE SILT.	8	12	17	18	29	
5	8.0	10.0					GRAY FINE SAND AND SILT.	5	4	3	6	7	
6	13.0	15.0					GRAYISH BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT.	1	1	2	2	3	
7	18.0	20.0				C (SP)	GRAY FINE SAND.	3	4	9	9	13	
							WET ON SPOON AT 2.3'.						
							WATER LEVEL THROUGH AUGERS AT 3.5'.						
							CAVED AT 2.0'.						

Notes/Comments:
Pocket Penetrometer Testing
 S6: 1.75 TSF

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.



TETRA TECH

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 Newark, Delaware 19713
 302.738.7551
 fax: 302.454.5988

TEST BORING LOG

Project Name:	POTENTIAL FUTURE BARRACKS (LOCATIONS A & B)	Project No.:	103IG8287
Project Location:	DEARNG, 163 SCANNELL BLVD, BETHANY BEACH, DELAWARE	Page 1 of 1	
Boring No.:	SB-06	Dates(s) Drilled:	05/19/22
Surface Elev.:		Inspector:	S. MCCOY
		Drilling Method:	SPT - ASTM D1586
Drilling Contractor:	JD Hynes & Assoc	Driller:	B. WALTERS
		Groundwater Depth (ft):	2.3
		Total Depth (ft):	20.0

Sample No.	Sample Depth (ft)		Strata Depth (ft)		Recov. (in)	Strata (USCS)	Description of Materials	6" Increment Blows *				N	
	From	To	From	To									
			0.0	0.5			APPARENT TOPSOIL (6")						
1	0.0	2.0	0.5			A (SP-SM) BROWN FINE TO MEDIUM SAND, TRACE SILT.	4	4	5	6	9		
2	2.0	4.0	2.0	2.5		B (SM) DARK BROWN FINE TO MEDIUM SAND WITH SOME ORGANIC SILT.	4	3	2	3	5		
			2.5				GRAYISH BROWN FINE TO MEDIUM SAND WITH SOME SILT.						
3	4.0	6.0				C (SM) GRAYISH BROWN FINE TO MEDIUM SAND AND SILT.	5	4	6	6	10		
4	6.0	8.0				GRAYISH BROWN FINE TO MEDIUM SAND WITH A LITTLE SILT.	6	11	12	10	23		
				8.5									
5	8.0	10.0	8.5			C1 (CL) GRAY SILTY CLAY WITH TRACE TO A LITTLE FINE SAND. (USCS: CL)	2	2	4	5	6		
				13.5									
6	13.0	15.0	13.5			C (SM) GRAY FINE TO MEDIUM SAND WITH SOME SILT.	4	7	10	11	17		
7	18.0	20.0		20.0		GRAY FINE SAND WITH A LITTLE SILT.	3	4	6	8	10		

Notes/Comments:
Pocket Penetrometer Testing
 S5: 1.75 TSF

* Number of blows of 140 lb. Hammer dropped 30 in. required to drive 2 in. split-spoon sampler in 6 in. increments.
 N: Number of blows to drive spoon from 6" to 18" interval.

APPENDIX C

Laboratory Testing Results

**LABORATORY TESTING SUMMARY
POTENTIAL FUTURE BARRACKS (LOCATIONS A and B)
DEARNG, BETHANY BEACH, DELAWARE**

SPT Soil Boring No.	Sample No.	Stratum	Depth of Sample (ft.)		Water Content, % (ASTM D2216)	Percent Silts/Clays, % (ASTM D1140)	Atterberg Limits (ASTM D4318)			USCS Classif. (ASTM D2487)
			From	To			Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	
SB-01	2	C	2.5	4.0	21.1	2.1	-	-	-	-
	3	C	4.0	6.0	20.4	4.8	-	-	-	-
	5	C	8.0	10.0	29.0	34.1	-	-	-	-
SB-02	2	C	2.4	4.0	19.3	1.2	-	-	-	-
	3	C	4.0	6.0	18.5	6.3	-	-	-	-
	5	C	8.0	10.0	25.0	21.8	-	-	-	-
SB-03	2	C	2.5	4.0	19.4	2.3	-	-	-	-
	3	C	4.0	6.0	18.5	16.1	-	-	-	-
	4	C	6.0	8.0	23.1	43.1	-	-	-	-
	5	C	8.0	10.0	27.3	45.7	-	-	-	-
SB-04	2	B	2.0	4.0	20.1	23.1	-	-	-	-
	3	C	4.0	6.0	24.5	30.4	-	-	-	-
	6	C	13.0	15.0	27.7	47.9	-	-	-	-
SB-05	2	B	2.0	4.0	20.2	22.3	-	-	-	-
	3	C	4.0	6.0	21.6	11.9	-	-	-	-
	5	C	8.0	10.0	27.1	48.3	-	-	-	-
SB-06	2	C	2.5	4.0	17.4	24.3	-	-	-	-
	3	C	4.0	6.0	11.5	40.2	-	-	-	-
	5	C1	8.0	10.0	25.2	89.1	48	25	23	CL
	6	C1	13.0	13.5	25.0	90.6	-	-	-	-

Notes:

- 1) Sample depths based on feet below grade at time of exploration.

UNIFIED SOIL CLASSIFICATION SYSTEM [Casagrande (1948)]

Major Divisions		Group Symbols	Typical Descriptions	Laboratory Classifications			
Coarse Grained Soils (More than half of material is larger than No. 200 sieve)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravel (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4: $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting C_u or C_c requirements for GW		
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines			
		Gravel with fines (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A Line or I_p less than 4	Limits plotting in hatched zone with I_p between 4 and 7 are borderline cases requiring use of dual symbols	
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line with I_p greater than 7		
	Sands (More than half of coarse fraction is smaller than No. 4 Sieve)	Clean sands (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6: $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting C_u or C_c requirements for SW		
			SP	Poorly graded sands, gravelly sands, little or no fines			
		Sands with fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures	Atterberg limits below A Line or I_p less than 4	Limits Plotting in hatched zone with I_p between 4 and 7 are borderline cases requiring use of dual symbols	
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above A line with I_p greater than 7		
		Determine Percentage of sand and gravel from grain size curve. Depending on Percentage of fines (fraction smaller than No. 200 sieve), coarse-grained soils are classified as follows: Less than 5 percent GW, GP, SW, SP More than 12 percent GM, GC, SM, SC 5 to 12 percent Borderline cases requiring dual symbols ⁽¹⁾					
		Major Divisions		Group Symbols	Typical Descriptions	For soils plotting nearly on A line use dual symbols i.e., $I_p = 29.5$, $w_L = 60$ gives CH-MH. When w_L is near 50 use CL-CH or ML-MH. Take near as ± 2 percent.	
Fine-grained soils (More than half of material is smaller than No. 200 sieve)	Silt and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity				
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
		OL	Organic silts and organic silty clays of low plasticity				
	Silt and Clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
		CH	Inorganic clays of high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity, organic silts				
	Highly organic soils	Pt	Peat and other highly organic soils				

(1) Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC. well-graded gravel-sand mixture with clay binder.

ATTACHMENT B

FIRE FLOW DATA



TETRA TECH

Berninger, Michael

From: Brad Dorey <BDorey@sussexshoreswater.com>
Sent: Thursday, April 21, 2022 12:44 PM
To: Berninger, Michael
Subject: RE: BBTS TT Officer Barracks Flow Test

Dear Mr. Berninger:

A fire flow test was performed on the fire hydrant located near the South gate of the Delaware Army National Guard Camp on 20 April 2022. The results are as follows:

- Static pressure – 68 psi
- Residual pressure – 49 psi
- Flow – 1000 gpm
- Orifice size – 2-1/2"
- Water main size/type – 6" ductile iron fire hydrant lead off of 8" PVC water main.

If you have any questions or need additional information, please advise.

Brad Dorey
Director of Operations
Sussex Shores Water Company
P. O. Box 170
39602 Waterworks Court
Bethany Beach, DE 19930
302-539-7611
302-539-0216 Fax
302-249-6474 Cell

From: Berninger, Michael <Michael.Berninger@tetrattech.com>
Sent: Wednesday, April 20, 2022 1:19 PM
To: Brad Dorey <BDorey@sussexshoreswater.com>
Subject: RE: BBTS TT Officer Barracks Flow Test

How did the test flow go?

Michael Berninger, AIA | Sr. Project Manager, RA, LEED AP BD+C, DBIA
Direct +1 (302) 283-2210 | Business +1 (302) 738-7551 | Mobile +1 (302) 275-1791 | michael.berninger@tetrattech.com

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From: Brad Dorey <BDorey@sussexshoreswater.com>
Sent: Tuesday, April 5, 2022 9:17 AM
To: Berninger, Michael <Michael.Berninger@tetrattech.com>
Subject: RE: BBTS TT Officer Barracks Flow Test

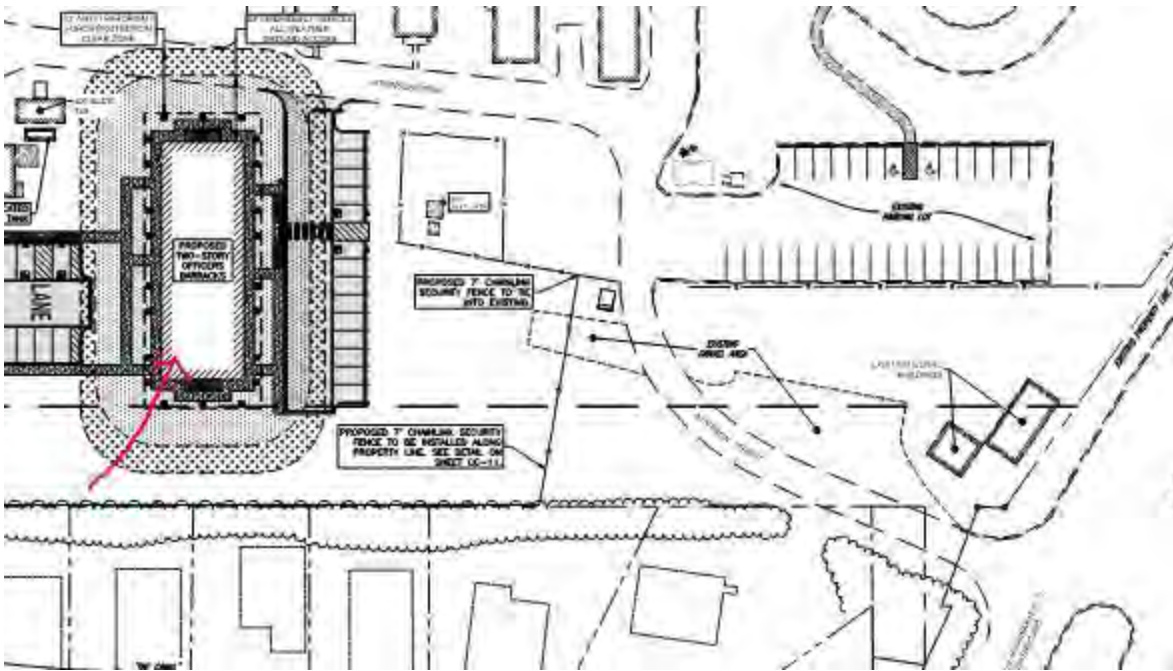
Got it. Thanks.

Brad Dorey
Director of Operations
Sussex Shores Water Company
P. O. Box 170
39602 Waterworks Court
Bethany Beach, DE 19930
302-539-7611
302-539-0216 Fax
302-249-6474 Cell

From: Berninger, Michael <Michael.Berninger@tetrattech.com>
Sent: Tuesday, April 5, 2022 9:13 AM
To: Brad Dorey <BDorey@sussexshoreswater.com>
Cc: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>; Barnett, William J Jr CW2 USARMY (USA) <william.j.barnett2.mil@army.mil>; Hurley, George Donald SFC USARMY NG DEARNG (USA) <george.d.hurley.mil@army.mil>; Longfellow, Rachel E MSG USARMY NG DEARNG (USA) <rachel.e.longfellow.mil@army.mil>; Martin, Nicholas <NMartin@cosentini.com>; Evans, Marc D MAJ USARMY NG DEARNG (USA) <marc.d.evans.mil@army.mil>
Subject: RE: BBTS TT Officer Barracks Flow Test

It was good to talk to you again. Per our discussion, you indicated you would get the flow test done in the next two weeks. Below is some information we are looking for.

Here is where the new building is currently designed to be located at is near the rear (south) gate.



Thanks

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From: Berninger, Michael

Sent: Tuesday, March 8, 2022 9:22 AM

To: 'bdorey@sussexshorewater.com' <bdorey@sussexshorewater.com>

Cc: 'Orndorff, Marc A CIV NG DEARNG (USA)' <marc.a.orndorff.civ@army.mil>; 'Barnett, William J Jr CW2 USARMY (USA)' <william.j.barnett2.mil@army.mil>; 'Hurley, George Donald SFC USARMY NG DEARNG (USA)' <george.d.hurley.mil@army.mil>; 'Longfellow, Rachel E MSG USARMY NG DEARNG (USA)' <rachel.e.longfellow.mil@army.mil>; Martin, Nicholas <NMartin@cosentini.com>; 'Evans, Marc D MAJ USARMY NG DEARNG (USA)' <marc.d.evans.mil@army.mil>

Subject: RE: BBTs TT Officer Barracks Flow Test

Brad, thank you for calling me about the flow test. As you indicated, the weather is not going to cooperate tomorrow because it will rain all day. You said that Sussex Shore Water is looking to flush your system at the beginning of April, and that would be a better time to do the flow test. We are ok with that strategy. Let us pick a today and time the week of 4/11 to set this up. What will work for you?

Thanks

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From: Martin, Nicholas <NMartin@cosentini.com>

Sent: Friday, March 4, 2022 5:49 PM

To: Evans, Marc D MAJ USARMY NG DEARNG (USA) <marc.d.evans.mil@army.mil>; Berninger, Michael <Michael.Berninger@tetrattech.com>

Cc: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>; Barnett, William J Jr CW2 USARMY (USA) <william.j.barnett2.mil@army.mil>; Hurley, George Donald SFC USARMY NG DEARNG (USA) <george.d.hurley.mil@army.mil>; Longfellow, Rachel E MSG USARMY NG DEARNG (USA) <rachel.e.longfellow.mil@army.mil>

Subject: RE: [URL Verdict: Unknown][Non-DoD Source] RE: BBTS TT Officer Barracks Flow Test

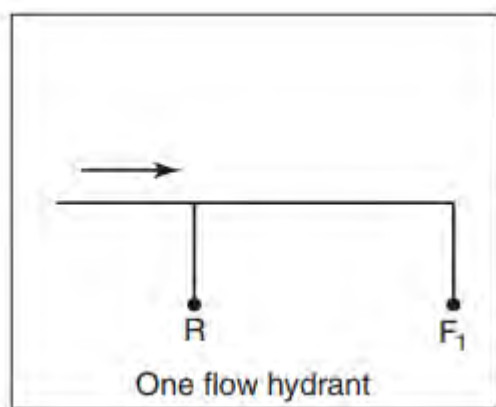
All,

Tetra Tech will have to witness the flow test in accordance with UFC 3-600-01, so Michael and I will coordinate a video call for Wednesday.

Specifics for the test:

The test must comply with NFPA 291 – in measuring the static pressure, residual pressure, and flow, the residual/pressure hydrant must be closest to the proposed facility and the flow hydrant is the first hydrant beyond the pressure hydrant.

From NFPA 291:



R = residual/pressure hydrant (measure static and residual pressure)

F₁ = flow hydrant (measure flow)

In addition, enough water should discharge from the flow hydrant to cause at least a 25% drop in pressure at the residual hydrant. If that can't be achieved, we should aim to flow at least 1,000 gpm.

Let me know if there are any questions.

Thank you,
Nick

Nicholas R. Martin, PE | Fire Protection Engineer
Code and Fire Engineering Group
Main: 617-748-7800 | Direct: 617-748-0040 | Mobile: 781-789-8881
nmartin@cosentini.com
nicholas.martin@tetrattech.com

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From: Evans, Marc D MAJ USARMY NG DEARNG (USA) <marc.d.evans.mil@army.mil>
Sent: Friday, March 4, 2022 4:15 PM
To: Berninger, Michael <Michael.Berninger@tetrattech.com>
Cc: Martin, Nicholas <NMartin@cosentini.com>; Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>; Barnett, William J Jr CW2 USARMY (USA) <william.j.barnett2.mil@army.mil>; Hurley, George Donald SFC USARMY NG DEARNG (USA) <george.d.hurley.mil@army.mil>; Longfellow, Rachel E MSG USARMY NG DEARNG (USA) <rachel.e.longfellow.mil@army.mil>
Subject: RE: [URL Verdict: Unknown][Non-DoD Source] RE: BBTS TT Officer Barracks Flow Test

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Mr. Berninger,

Sussex Shores has our flow test tentatively scheduled for Wednesday 9March at 10 am.
If there are any specifics that I need to identify or spell out for the test, please advise by Monday.

Marc D Evans
MAJ, CM, USA
G3 Training Site Manager
193rd RTI AO
302-326-7911 office
302-290-9055 cell
marc.d.evans.mil@army.mil

From: Berninger, Michael <Michael.Berninger@tetrattech.com>
Sent: Friday, March 4, 2022 2:59 PM
To: Evans, Marc D MAJ USARMY NG DEARNG (USA) <marc.d.evans.mil@army.mil>
Cc: Martin, Nicholas <NMartin@cosentini.com>; Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>
Subject: RE: [URL Verdict: Unknown][Non-DoD Source] RE: BBTS TT Officer Barracks Flow Test

It has to be within a year.

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From: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>
Sent: Friday, March 4, 2022 12:23 PM
To: Evans, Marc D MAJ USARMY NG DEARNG (USA) <marc.d.evans.mil@army.mil>; Berninger, Michael <Michael.Berninger@tetrattech.com>
Cc: Martin, Nicholas <NMartin@cosentini.com>
Subject: RE: [URL Verdict: Unknown][Non-DoD Source] RE: BBTS TT Officer Barracks Flow Test

Marc,

I think a recent test would suffice. That would be great.

Respectfully,

Mr. Marc Orndorff
Design & Project Manager
Delaware Army National Guard
1 Vavala Way
New Castle, DE 19720
EMAIL: marc.a.orndorff.civ@army.mil
(w) 302-326-7132
(c) 302-893-4393

From: Evans, Marc D MAJ USARMY NG DEARNG (USA) <marc.d.evans.mil@army.mil>
Sent: Friday, March 04, 2022 11:33 AM
To: Berninger, Michael <Michael.Berninger@tetrattech.com>
Cc: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>; Martin, Nicholas <NMartin@cosentini.com>
Subject: RE: [URL Verdict: Unknown][Non-DoD Source] RE: BBTS TT Officer Barracks Flow Test

I made contact with Sussex Shores but have to call back after lunch. Does it have to be a new flow test or would documented results from a recent one suffice?

Marc D Evans
MAJ, CM, USA
G3 Training Site Manager
193rd RTI AO
302-326-7911 office
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Cc: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil>; Martin, Nicholas

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We do want as accurate as reading as we can get. Can you look into the water department to see what they can do? I can be there and have a video chat with our fire protection engineer to witness the test.

Thanks

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Cc: Berninger, Michael <Michael.Berninger@tetrattech.com>

Subject: RE: BBTS TT Officer Barracks Flow Test

Marc,

Again, I appreciate the great insight. Please let Michael Berringer know when you are conducting the results, so TetraTech can either be present or coordinate receiving the results of the test. Thank you!

Respectfully,

Mr. Marc Orndorff
Design & Project Manager
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Subject: RE: BBTS TT Officer Barracks Flow Test

I have some contacts that we can reach out to in the morning.

The scenario you described for Aetna stems from them connecting the hydrant to an intake manifold and reporting a low reading on the intake side of the pump. A good indicator but not as precise as a pitot. If you are okay with checking pressures from the gauge on the pump, I can probably get that done a lot quicker.

From: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil < Caution-mailto:marc.a.orndorff.civ@army.mil > >
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Subject: RE: BBTS TT Officer Barracks Flow Test

Marc,

Thanks for the insight. In Newark we have very low water pressure in parts of the town and the fire department is constantly notifying the city of the problem. I thought they did the testing. Anyway, do you have a POC at the water department that could steer us in the right direction?

Respectfully,

Mr. Marc Orndorff
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Subject: RE: BBTS TT Officer Barracks Flow Test

Actually there is no requirement for the fire departments to flow test their hydrants unless they are looking to improve their ISO rating. It's rare for them to even have a pitot gauge to conduct the test and it is more common for them to 'flush' the mains periodically.

The municipal water department is more likely to have the equipment and conduct the test. I would be curious what our flow rates are on BBTS so we could color code the bonnets according to the NFPA system.

Marc

From: Orndorff, Marc A CIV NG DEARNG (USA) <marc.a.orndorff.civ@army.mil < Caution-mailto:marc.a.orndorff.civ@army.mil > >
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Subject: RE: BBTS TT Officer Barracks Flow Test

Thanks Chris,

As far as I know fire departments are required to do flow tests for their jurisdictions periodically to confirm they have sufficient pressure. Usually they will do the test for free if you ask.

Respectfully,

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Delaware Army National Guard
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Subject: RE: BBTS TT Officer Barracks Flow Test

Not that I know about. I do remember Artisan testing the one outside of Duncan when I was building manager at AASF

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Subject: FW: BBTS TT Officer Barracks Flow Test

Gentlemen,

Do any of you know if we flow test our fire hydrants on any kind of regular basis and have we flow tested our fire hydrants at BBTS?

Respectfully,

Mr. Marc Orndorff
Design & Project Manager
Delaware Army National Guard
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New Castle, DE 19720
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Subject: [Non-DoD Source] BBTS TT Officer Barracks Flow Test

Do you have a recent (within the last year) flow test of a hydrant near where we are putting the Barracks?

Thanks

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ATTACHMENT C

ARNG DG 415-4 ARMY NATIONAL GUARD TRAINING SITE FACILITIES DESIGN GUIDE



TETRA TECH

**ARMY NATIONAL GUARD
DG 415-4
TRAINING SITE FACILITIES
DESIGN GUIDE**



**NATIONAL GUARD BUREAU
INSTALLATIONS DIVISION
111 SOUTH GEORGE MASON DRIVE
ARLINGTON, VA 22204-1382**

FOREWORD

This Training Site Facilities Design Guide (DG 415-4) was published by the National Guard Bureau, Army Installation Division (ARNG-ILI). DG 415-4 applies to all projects for new construction (including additions) as well as alterations to and rehabilitation and conversion of existing facilities. It is intended to assist the States, Territories, the District of Columbia and design professionals in gaining an understanding of the functions and the unique environmental considerations to address in the construction documents development. This design guide does not contain criteria but refers readers to sources of criteria in other publications that relate directly to the specific technical design requirements.

This Training Site Facilities Design Guide should be used in conjunction with the General Facilities Information Design Guide (DG 415-5) to develop the final project design.

Distribution is limited. However, authorized users of the NGB Guard Knowledge Online (GKO), can obtain an electronic copy at (gkoportal.ngb.army.mil/sites/ARI_HQ/default.aspx), Design, Guide Library site. All users are encouraged to submit comments and suggestions to improve this document by completing DA Form 2028, "Recommended Changes to Publications and Blank Forms," and sending it directly to:

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Installations Division
ARNG Readiness Center
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Arlington, VA 22204-1382

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CHAPTER 1

GENERAL INFORMATION

1-1 PURPOSE: PERFORMANCE DESIGN GUIDE

This Training Site Facilities Design Guide (DG 415-4) sets forth general functional guidance for the design architect-engineer (A-E) to use in developing the design and construction documents for the Army National Guard (ARNG) training site facilities projects. This design guide is applicable to all construction projects, including new construction, major alterations, rehabilitations and adaptive reuse of existing facilities. All ARNG facilities must be designed and constructed applying the principles and practices of sustainable design and development using U.S. Green Building Council LEED-NC Version 3.0 Green Building Rating System to achieve a “Silver” rating. To aid to the reader in using this design guide, the following are included:

- Appendix A, Unique References, lists reference documents that pertain specifically to this building type; other references cited in this design guide are included in the References in DG 415-5.
- Appendix B, Glossary, defines the acronyms and abbreviations used in this design guide as well as specialized terms that are unique to this design guide.
- Appendix C contains several tables of requirements.
- Appendix D contains the figures that illustrate the explanations in the text.

1-2 FUNCTIONS AND OPERATIONS OF TRAINING SITE FACILITIES

This design guide pertains to the following types of ARNG training site facilities:

- Major training area (MTA) facilities, which provide the land and permanent or semi-permanent facilities (including billeting, dining facilities, ranges, bivouac areas, special training structures, administrative and other logistic buildings, and tank trails) to support ARNG troops during training and/or inactive duty training
- Local training area (LTA) facilities, which provide the land and facilities to support ARNG troops during weekend inactive duty training (IDT) and, in rare cases, two-week annual training (AT)

Standard Design Guidance for Training Ranges (Live Fire) Combined Arms Collective Training Facility, Shoot House, MOUT, Urban Assault Course, ASP and RETS are provided by USACE Huntsville Division Huntsville, AL.

CHAPTER 2

MAJOR TRAINING AREA FACILITIES

2-1 GENERAL INFORMATION

2-1.1 Scope

An MTA generally comprises two operational land areas:

- The cantonment area
- The area for bivouacking, ranges, special training structures, and ammunition storage

These areas are used for the weekend IDT and two-week AT that each soldier (unless exempted) is required to perform.

2-1.2 Standards

Detailed guidance regarding design criteria and construction standards not found in this design guide is available from the State construction and facilities management officer (CFMO) or ARNG-ILI. The authorized space criteria and outside support items for facilities being designed are to be obtained from the approved NGB program documents. The design A-E should be provided with the MTA Master Plan that has been approved by the ARNG Chief and be instructed to follow it during the design process. Any deviations from the Master Plan must be approved by the State Military Department, CFMO.

2-1.3 Sizing

The MTA is sized based on troop usage determined by the State Military Department and ARNG-ILI. Sizing is the basis for determining the number of troop billets authorized. The number of troop billets ranges from the accommodation of a few companies (each consisting of 100 to 200 troops), one or more battalions (each generally 500 or more troops), one or more brigades (each generally three battalions), or a division (three brigades).

2-2 STAFF ORGANIZATION

2-2.1 Battalion, Brigade, Group, or Command Headquarters

(Similar to 2-2.2, Units and Detachments maybe located in several States)

2-2.2 Organizational Responsibilities

Each command headquarters has a commanding officer (CO) with four major administrative staff elements (personnel, intelligence, operations, and logistics). The brigade, group, or command headquarters has one additional major staff element (civil-military operations), for a total of five.

2-2.2.1 Personnel Staff Element

The personnel staff element has the following primary responsibilities:

- Unit strength maintenance
- Personnel service support
- Discipline
- Law and order
- Civilian personnel
- Administrative support for other personnel
- Safety and accident prevention
- Headquarters management

2-2.2.2 **Intelligence Staff Element**

The primary responsibilities of the intelligence staff element are producing intelligence, counterintelligence, and intelligence training.

2-2.2.3 **Operations Staff Element**

The primary responsibilities of the operations staff element are unit operations, organization, and training.

2-2.2.4 **Logistics Staff Element**

The responsibilities of the logistics staff element are supply, transportation, and services.

2-2.2.5 **Civil-Military Operations Staff Element**

The responsibilities of the civil-military operations staff element are civil affairs and civil-military relationships.

2-3 **DESIGN GUIDANCE FOR PROGRAM SPACES – CANTONMENT AREA FACILITIES**

2-3.1 **General Information**

Cantonment area facilities may consist of:

- Open bay barracks
- Private room bachelor officer quarters (BOQ)
- Bachelor enlisted quarters (BEQ)
- Battalion headquarters
- Battalion maintenance shelter

- Battalion supply and ration breakdown
- Company supply and administration
- Dining facilities
- Indoor physical fitness area
- Outdoor running track
- Site headquarters
- Troop issue subsistence activity

(See Figure 1, Battalion Set Site Arrangement, in Appendix D). Adequate power for technology related to communication systems and generator backup equipment should be provided.

Each of these cantonment area facilities may be constructed as a separate building, or several functions may be combined into one building, called a "consolidated facility" (refer to Paragraph 2-3.13, Consolidated Facilities, for more information). Generally, the approved program documents and the Master Plan identify whether separate, consolidated, or both separate and consolidated facilities are to be designed for an MTA.

2-3.2 Barracks, Toilets, and Laundry

The barracks may be an open-bay sleeping area for enlisted personnel (staff sergeant [E6] and below), with consolidated toilets, or it may consist of four-person modules with toilets and showers. A laundry may also be included. The barracks may be designed as a separate building or consolidated in one building that includes billeting, dining, and company supply and administration.

Barracks are to be sized for the number of personnel and number of buildings stated in the approved program documents and the Master Plan. The barracks size is generally in personnel increments of 40 (40, 80, 120, 160, etc.).

2-3.2.1 Barracks

The approved program documents should indicate whether the facility is a separate or consolidated building. The program documents also show the net floor area for billeting, laundry (when authorized), and the toilets. Generally, the minimum plumbing fixtures should be as stated in the plumbing code. *Barracks for Training Sites should be based on the Operational Readiness Training Center (ORTC) standard design. See Figure 2, Barracks Partial Plan (ORTC) in Appendix D.*

2-3.2.2 Toilets

Figure 3, BOQ/BEQ Partial Plan, in Appendix D is one example of a separate building layout for an open bay barracks, with a toilet area, for 40 to 160 persons.

2-3.2.3 Laundry

A laundry area, if authorized in the approved program documents, may be added to the barracks. The laundry is generally in a central location adjacent to the toilet room and mechanical room area to reduce utility runs. See Figure 3.

2-3.3 Bachelor Officer and Enlisted Quarters

The BOQ and BEQ are billeting facilities comprising semi-private and private rooms with semi-private and private toilets. The BOQ and BEQ must be sized for the number of personnel, the functional areas, and the number of buildings as stated in the approved program documents and the Master Plan. The number of rooms in a single building varies; the minimum is approximately 15 rooms. These facilities may be separate buildings and not consolidated with any other functional area such as barracks, dining, headquarters, and company supply and administration. See Figure 3.

The building generally includes the sleeping areas; laundry (if authorized); toilets; and a small mechanical, electrical, and custodial room. A laundry area, if shown in the approved program documents, may be located in each separate BOQ or BEQ building and be designed to the authorized net floor areas. If the design capacity, type of functional areas, and number of buildings are not clearly stated in the approved program documents, the State Military Department, CFMO will provide specific guidance.

2-3.4 Battalion Headquarters Buildings

Generally, the commanding officer, executive officer, personnel, intelligence, and operations staff officer functions are located in the battalion headquarters buildings. The logistics staff officer functions are located in the battalion supply and ration breakdown building. All the staff officers, including the logistics officers, are located in the brigade, group, or command headquarters buildings.

2-3.5 Battalion Maintenance Shelter

The maintenance shelter is used to provide organizational maintenance on military equipment (such as tanks, trucks, personnel carriers, and compressors) and is normally located within the battalion motor pool. It does not require any special installed equipment to help in the performance of the maintenance mission because all necessary equipment is portable or movable and brought in by the maintenance personnel. The remainder of this shelter is normally enclosed on three sides unless the approved program documents justify heating, in which case four sides with vehicle doors are required. *(Address water and compressed air needed.)*

2-3.5.1 Dimensional Layout

There should be two maintenance Work Bays, with no columns between them. This provides clear floor area which allows space for the repair and maintenance of a large piece of military equipment. Some space should be used for an office and a toilet. The clear height should be 15 ft for the Work Bay area and 10 ft for the support area.

2-3.5.2 Doors and Windows

If the maintenance shelter is enclosed on three sides, only one door may be installed; if it is enclosed on four sides, two personnel doors should be adequate. A shelter

enclosed on four sides may have four insulated vehicle doors 14 ft by 16 ft wide or two insulated vehicle doors 14 ft by 20 ft wide to provide pull-through capability and to allow better air circulation during mild and hot weather. Windows may be authorized, and vehicle doors may include window lights.

2-3.5.3 Floor Construction

The floor of the maintenance shelter should be a slab on grade of concrete in accordance with the recommendations in DG 415-5, Chapter 6, Common Architecture and Engineering Technical Guidelines.

2-3.5.4 Building Systems

If heating is authorized for the maintenance shelter, unit heaters or infrared heaters should be provided, with adequate insulation, supported by heat transmission factor calculations. Ventilation should be provided by two general area exhaust fans at the high point of the roof and two wall exhaust fans located approximately 12 in. above the floor.

If heating is not authorized, no insulation or ventilation is necessary (even on the underside of the roof) because one side of the shelter normally does not have a wall. This provides adequate air circulation to eliminate any serious condensation problems and engine exhaust accumulation.

2-3.5.5 Pre-Engineered Metal Shelter

A pre-engineered metal shelter may be used if economically feasible and sufficiently durable for the intended use. The roof and wall panels should be cold-formed steel sheets. The exterior finish should be a system that provides the appropriate life expectancy. Roof and wall panels may be aluminum with a factory-applied coating. Roof panels may contain some translucent panels, provided those panels can be substituted for metal panels without the need for special design and construction. A 20-year warranty should be obtained for the roof.

2-3.6 Battalion Supply and Ration Breakdown Building

The supply and ration breakdown building contains supply storage, a supply office, a small miscellaneous storage area, a ration breakdown area, and toilets. The supply storage area is used to store supplies needed to support the troops, separate like items, and distribute nonperishable (non-food) items. The ration breakdown functional area is used to store food supplies, separate them into like items, and distribute the supplies needed for preparing meals in the dining facilities for the troops. Industrial-grade open shelving attached to the floor may be included in the design supported by Federal construction funds. The surface area of the shelving should be equal to or less than the net floor area of the ration breakdown or supply storage area. The structural clear height should be approximately 10 ft.

2-3.7 Supply and Administration

The supply and administration facility may be for a single company (unit) or it may be for two companies (units). The supply functions consist of storing and distributing nonperishable supply items required for the troops to perform their training missions. The administrative functions are some of the same functions as addressed in Paragraph

2-2.1, Battalion Brigade, Group, or Command Headquarters, except at a lower echelon. The supply and administration facility is often constructed in a consolidated building that also includes the billeting for enlisted personnel, and/or a dining facility for all personnel.

2-3.8 Dining Facilities

The Dining Hall (Mess) facilities are located near troop billets and company supply and administration facilities. The enlisted personnel barracks, company supply and administration, and/or dining facilities may be combined into one consolidated facility; however, the dining facilities discussed here are intended to be located in an independent building. For specific design guidance on stand-alone buildings refer to UFC 4-722-01 Dining Facilities

2-3.8.1 Size of Facility

The design options for dining facilities include three basic standard sizes: 200 person, 400 person and 800 person facilities. The facility size indicates the population to be served; it does not imply that this number of persons is seated simultaneously. Reference NG PAM 415-12 Chapter 5, for the facility space allowances.

2-3.8.2 Standard Drawings and Equipment Schedules

Standard drawings and kitchen equipment schedules can be obtained through the following:

U.S. Army Quartermaster Center and School
Attn: ATSM-CES-OE, 1201 22nd Street, Bldg. P-5000
Fort Lee, VA 23801-1601
Commercial (804) 734-3450
DSN: 687-3354

Dimensions and equipment authorizations vary depending on the number of personnel to be supported by the facility. The kitchen equipment schedules indicate which pieces of equipment are to be included in the design as contractor furnished and contractor installed and which equipment is to be government furnished and contractor installed. In all cases, the design is to include all necessary utility connections. See Figures 1 and 2, Kitchen Equipment Layouts in DG 415-5.

2-3.9 Indoor Physical Fitness Area

The net floor area authorized for the indoor physical fitness area should be obtained from the approved program documents. The net floor space authorized may be partitioned to provide three separate functional areas:

- An exercise room, which may be an unobstructed floor area for exercising
- A weight room with exercise machines and space for free-weight exercises
- An office and storage room which provides space for keeping exercise records, supplies for programs and first aid, sign-out equipment, and a work station for the person in charge

The planned usage of the three separate areas may vary depending on the availability of exercise equipment, the equipment selected, the clearances between equipment, and the size of each exercise station. Refer to DG 415-5, Chapter 5, Common Functional Planning and Building Design Guidelines, for more general considerations in the design of this space.

2-3.10 **Outdoor Running Track**

An outdoor running track of at least ½-mile distance should be provided in addition to the indoor physical fitness area. Lighting for night running should be provided, along with a parking facility.

2-3.11 **Site Headquarters**

The site headquarters facility, when authorized, is for a battalion-sized MTA or larger if NGB has authorized a full-time operating staff. The functions of the full-time operating staff are as follows:

- Program and maintain all buildings, ranges, and real estate.
- Issue billeting, supplies, materials, and food items.
- Purchase and contract for services, supplies, materials, and food items.
- Provide accounting and financial services for the overall operation of the MTA in support of the troop training mission.

The site headquarters may be included within another training site building or may be a separate building. The actual total net floor area (including circulation; toilets; and the mechanical, electrical, and custodial room), plus the size and type of individual functional areas, should be obtained from the approved program documents and should be consistent with the Master Plan.

2-3.12 **Troop Issue Subsistence Activity**

The TISA facility stocks all perishable and nonperishable items needed to supply the dining facilities or field kitchens operated at an MTA. The TISA facility has the capability to store refrigerated, non-refrigerated, and frozen food and grocery items. A TISA is authorized only at locations where commercial supplies are not available within a reasonable distance. If a TISA is to be designed, the State CFMO may contact ARNG-ILI to obtain the necessary design guidance. If a TISA is authorized, a battalion supply and ration breakdown building is not necessary because supplies are drawn directly from the TISA.

2-3.13 **Consolidated Facilities**

The authorized supply and administration, dining facility, barracks, laundry, and toilet areas may be consolidated into a single building. The approved program documents and the Master Plan should be used to determine the facilities, net floor area, and circulation patterns that may be included in the single consolidated building.

2-3.14 Simulation Facility

These buildings or rooms are used for instructions and training purposes and permanent storage of simulation devices. The simulation devices maybe motion or non-motion based to train crews on various weapon systems. The design team must consult the simulation device for specific environmental and utilities requirements.

2-3.15 Aviation Facilities

Refer to the DG 415-3, Aviation Facilities Design Guide, for guidance related to the design of aviation facilities.

CHAPTER 3

LOCAL TRAINING AREAS

3-1 GENERAL DESCRIPTION

3-1.1 Scope

The type of construction for an LTA facility should be consistent with training in a field environment. Construction may be temporary or semi-permanent, as shown in the approved program documents and the Master Plan. An LTA may comprise two operational land areas:

- The cantonment area
- The location of the bivouac areas, ranges, and special training structures

3-1.2 Standards

The design A-E should be provided with the LTA Master Plan that has been approved by the Chief, Army National Guard, with any deviations approved by the State Military Department, CFMO. Detailed guidance regarding technical criteria and construction standards is available from the State CFMO or ARNG-ILI. The authorized space requirements and outside support items for facilities being designed are to be obtained from the approved program documents.

3-2 LTA SUPPORT FACILITIES

The following paragraphs discuss many of the items needed to support an LTA. Some LTAs may have existing facilities that can be converted or rehabilitated and operated at equal or less cost than constructing new facilities. (This should be addressed in the approved program documents)

3-2.1 Tent Floors

Concrete or wooden tent floors can be used for general-purpose medium or large tents. The concrete floor should generally be 4 in. thick. Wooden floors may be constructed from 1-in. or 2-in.-thick treated lumber, depending on the distance between unsupported floor members. If electric power and potable water are within or near the area of the tent floor construction, the items in the following table are authorized.

LTA Support Facilities

Use	Hose Bibb	110-Volt Duplex Outlet
Squad Tent (billeting)	One	One
Mess Tent	Two	One plus (one for every two pieces of electrical equipment)
Company Supply & Administration	None	Two
Headquarters (battalion or higher)	None	One plus (one for every two pieces of electrical equipment)

3-2.2 Field Kitchens

When the approved program documents authorize temporary or semi-permanent construction, the field kitchens are to consist of a 4-in.-thick concrete floor (of the same construction as for similar tent floors), a lightweight shingled or metal roof, 4-ft-high concrete block or wood siding with screens above, and wood shutters to cover the screens to secure the building when not in use.

3-2.3 Dining (Mess) Shelter

When the approved program documents authorize temporary or semi-permanent construction, the mess shelters are to consist of a 4-in.-thick concrete floor, a lightweight shingled or metal roof, and no sides. Walls that are 4 ft high and constructed of concrete block or wood siding and screens are authorized.

3-2.4 Latrine

Latrine construction should consist of a concrete floor; a lightweight shingled or metal roof structure; and sides of wood, metal, or concrete block. Ventilation openings should be screened and shuttered. No windows are authorized. Unless an existing sanitary system is available at the site, concrete holding tanks or pits should be provided according to applicable Federal, State, and local environmental laws and regulations. Other types of construction may be considered, provided that the life cycle cost analysis is equal to or less than that of this latrine design.

3-2.5 Roads and Parking

The detailed information for the design of roads and parking can be found in the paragraphs addressing military and privately owned vehicle parking in DG 415-5, Chapter 6. The table below shows the allowable number of parking spaces and associated paved areas for administrative and training functions.

Military Vehicle Parking Requirements

Type of Facility	Parking Spaces	Paved Area (yd ²)
Headquarters (Brigade, Group, Command)	12	288
Headquarters (Battalion)	8	192
Battalion Supply and Ration Breakdown	8	192
Company Supply & Administration		
(2 Unit)	8	192
(1 Unit)	4	96
Dining Facilities		
200 Person	4	96
400 Person	6	144
800 Person	8	192

CHAPTER 4

EDUCATIONAL FACILITIES

4-1 GENERAL DESCRIPTION

This chapter contains functional design guidance for ARNG educational facilities, including all schools, regional training institutes, State military education facilities, and their supporting requirements. Figure 4 illustrates the basic site arrangement of a regional training institute.

4-2 SCHOOLS

4-2.1 General Description

Refer to USACE-Norfolk District; TRADOC Standard Design; General Instruction Building (GIB) and UFC 4-171-02A Design Guide: U.S. Army Service Schools.

4-3 DESIGN GUIDANCE FOR PROGRAM SPACES

4-3.1 Administration Spaces

4-3.1.1 General Administration Offices

The general administrative office area may have several individual offices, but the major portion should be an open bay office area in which modular or conventional furniture may be installed.

4-3.1.2 Supply and Publication Storage

These storage spaces may include an amount of shelving surface equal to the net floor area of the storage room(s). The shelving should be made of wood or metal and attached to the floor.

4-3.2 Material Reproduction and Mail Center

The reproduction and mail center should have an electrical outlet for each piece of reproduction equipment. The design may also include a commercially fabricated built-in mail and distribution system.

4-3.2.1 Toilets/Showers/Lockers

Refer to DG 415-5, Chapter 5, for design guidance related to toilet and shower areas. The locker room is intended for storage of individual equipment. The total authorization of the size, type, and number of lockers for each educational facility is identified by the State CFMO or obtained from the approved program documents.

4-3.3 Educational Spaces

4-3.3.1 Classrooms

The classrooms are used for the officers' candidate school and for teaching the basic non-commissioned officers' development course, the platoon leadership development course, advance courses, military occupation specialty qualifications (MOSQ) courses, and other, miscellaneous courses. Larger classrooms (900 ft² and over) may be

subdivided by using acoustically insulated accordion or folding partitions. Sound deadening to attain a sound transmission coefficient (STC) of 40 or better should be provided at the movable partition location to allow the subdivided areas to operate without disturbing each other. The larger classrooms may have two fixed speaker's platforms (one for each subdivided area). In addition, the following should be provided:

- Lighting controls at a point convenient to the speaker or instructor as well as at the door for all classrooms
- Chalkboards or marker boards (up to 64 ft² for classrooms 900 ft² and larger and 32 ft² for all other classrooms) with map rails
- Generally, one 110-volt electrical duplex outlet on each of three walls and two on the wall at the front of the room for classrooms smaller than 900 ft²
- Generally, two 110-volt duplex electrical outlets on each of three walls and two to four on the wall and platform at the front of the room for classrooms 900 ft² and larger (If the larger classroom is subdivided with a movable partition, each subdivided area should have one-half the total number of electrical outlets in the classroom.)
- (Optional) A 110-volt duplex overhead outlet if an overhead mounted projector is anticipated
- A map rail system consisting of separate sections of approximately 8 linear ft (LF) for rooms smaller than 900 ft² and 16 LF for rooms 900 ft² and larger

4-3.3.2 Instructions Preparation and Counseling

This office area is used by the class instructors to prepare class plans and schedules, analyze student assignments, and counsel students. The office area should typically be one large space with pre-wired work stations. Generally, an instructor's work station requires approximately 60 ft², which includes a desk or work station, two chairs (one for the instructor and one for the student being counseled), and circulation space. No chalkboards should be planned for this area. One 110-volt duplex electrical outlet per instructor is authorized.

4-3.3.3 Multi-Purpose Training Area

This area, to be used for a variety of training purposes, should be one large room with a level floor. This large room may be subdivided, when required, using an accordion or folding partition. Sound-deadening material to attain an STC of 40 may be provided for the movable partition to allow the subdivided areas to operate without disturbing each other. Lighting controls should be installed at entrances to the area or to the subdivided area. A maximum of three 32-ft² chalkboards or marker boards with map rails may be provided. Generally, one 110-volt duplex electrical outlet may be authorized for each 12 ft of the perimeter wall. However, this is only to determine the total number of outlets; the outlets may be located where required for teaching or training purposes.

4-3.3.4 Auditorium

The floor of the auditorium may be sloped approximately 1 ft in 12 ft from the speaker's platform. The speakers' platform area should have approximately four 110-volt duplex outlets (strategically placed), lighting controls, and a 10-ft by 8-ft ceiling-mounted pull-down projection screen. The side and back walls may have a maximum of three 110-volt duplex electrical outlets per wall. A speaker system with a microphone, amplifier, speaker(s), and cable may be provided. Fixed seats may be authorized. To allow flexibility in the use this area for other functions, the design A-E, user, and State CFMO may consider a level floor with no fixed seating. The ceiling height should be 9 ft, or the height to the underside of the exposed structure should be 10 ft at the lowest point.

4-3.3.5 Library

The library may be located as a part of, near, or adjacent to the learning center. Industrial steel or wood shelving that is 8 ft high, attached to the floor, and equal to the library net floor area may be provided. Space should be allocated for a small desk for the librarian, a standard-size two-drawer filing cabinet, and one or two small-sized reference tables (approximately 3 ft by 5 ft) with chairs. These items (the desk, filing cabinet, tables, and chairs) are not to be purchased with Federal construction funds. Four 110-volt duplex electrical outlets, located for easy access, are authorized. A telephone outlet is also authorized.

4-3.3.6 Learning Center

The learning center should be located adjacent to, or be combined with, the library. This space may be equipped with individual study carrels that are pre-wired and installed. It should have built-in steel or wood shelving and/or racks (limited to the longest wall from the floor to a height of 8 ft) and electrical outlets to accommodate AV equipment in the study carrels. For the purpose of locating outlets and allocating floor space, the carrels can be assumed to be 4 ft by 2 ft 6 in.

4-3.3.6 Distance Learning Center

The distance learning center provides space for delivery of remote training and educational resources. It requires accommodation of voice and data links.

4-3.3.7 Training Device/Simulation Center

The space and electrical service requirements should be coordinated with the equipment being supplied.

4-3.3.8 Training Aid and Audio/Visual Storage Room(s)

The training aid and AV storage room(s) should be adjacent to and preferably have direct access to the learning center or classrooms. These room(s) should be designed to maximize wall space for book storage. One full wall of built-in steel or wood shelving and/or racks should be provided for each room. Shelving in the AV storage area should be 36 in deep, with a 20-in. vertical clearance, to accommodate relatively bulky equipment.

4-3.3.10 Test Control Storage

4-3.3.11 Break Area

Refer to DG 415-5, Chapter 5.

4-3.3.12 Physical Fitness Area

The physical fitness area should have a net floor area of approximately 1,000 ft². The authorized floor space may be partitioned off to provide three separate functional areas:

- An exercise room, which may be just an unobstructed floor area for exercising
- A weight room for exercise machines and free-weight exercises
- An office and storage room, which has space for keeping exercise records, programs, first aid supplies, and equipment signout forms and which has a work station for the person in charge

These separate functional areas may vary depending on the availability of exercise equipment, equipment selected, clearances between equipment, and size of each exercise station. A starting point for sizing the three areas could be 200 ft² for the office and storage room, 400 ft² for the weight room, and 400 ft² for the exercise room. The three areas may vary from these sizes, depending on the actual planned usage, but the total net floor area is to be held to the authorized amount within the flexibility rule. Refer to DG 415-5, Chapter 5, for more information.

4-3.4 Additional Spaces

4-3.4.1 Toilets (Male and Female)

Refer to DG 415-5, Chapter 5.

4-3.4.2 Outside Support Items

The design guidance for privately owned vehicle and military vehicle parking, sidewalks, access roads, and fine grading and seeding is included in DG 415-5, Chapter 6.

4-3.5 Dining Area and Kitchen

Dining facilities should be located near troop billeting or in the same building.

4-3.5.1 Size of Dining Facility

Three different capacity levels are considered, depending on the size of the dining facility:

- 200 persons
- 400 persons
- 800 persons

The size of the facility indicates the population to be served; it does not imply that this number of persons is seated simultaneously. See Figure 1 and 2 Kitchen Equipment Layouts in DG 415-5.

4-3.5.2 Drawings and Kitchen Equipment Schedules

Standard drawings and kitchen equipment schedules are referenced in Design Guide (DG) 415-5, General Facilities Information Appendix D. The Proponent for the Standard Kitchen Equipment and Layout is as follows:

U.S. Army Quartermaster Center and School
Attn: ATSM-CES-OE, 1201 22nd Street, Bldg. P-5000
Fort Lee, VA 23801-1601
Commercial (804) 734-3450
DSN: 687-3354

Dimensions and equipment authorizations vary depending on the number of persons to be supported by the facility.

4-3.6 Facility Maintenance and Custodial Area

Refer to DG 415-5, Chapter 5.

4-3.7 Mechanical, Electrical, and Telecommunication Room(s)

Refer to DG 415-5, Chapter 5.

4-3.8 Billeting

The student billets; toilets; laundry room; and mechanical, electrical, and custodial room should follow the design guidance for the BOQ and BEQ provided in Paragraph 2-3.3.

CHAPTER 5
UNIQUE ARCHITECTURAL AND ENGINEERING
TECHNICAL REQUIREMENTS

<u>Device Type</u>	<u>Acronyms</u>
EST (10 Lane)	Engagement Skills Trainers
Beam Hit (LMTS)	Laser Marksmanship Training Systems
FSCATT (HCT)	Fire Support Combined Arms Tactical Trainer
DSTATS	Digital Systems Test and Training System
Janus	No acronym. It is the name of a systems that trains warfighter exercises
AFIST	Abrams- Full Crew Interactive Simulation Trainer
AFIST XXI	Abrams- Full Crew Interactive Simulation Trainer 21
MCOFT	Mobile- Conduct of Fire Trainer
UCOFT	Unit- Conduct of Fire Trainer
Mobile SIMNET	Mobile Simulations Network
Fixed SIMNET	Fixed Simulations Network
TADSS	Training Aids Devices Simulations Systems
FATS	Fire Arms Training System
B-FIST	Bradley- Full Crew Interactive Simulation Trainer
TFT	Tabletop Full
VDGT	Virtual Door Gunner Trainer
M-CCTT	Mobile-Close Combat Tactical Trainer
VCOT	Virtual Convoy Operations Trainer

<u>Minimum Space Required</u>	<u>Power Required</u>	<u>Grounding</u>	<u>Climate Control</u>	<u>Lighting</u>
40 x 40	110	Yes	Yes	Variable
None	110	No	No	No
18 x 30 x 18	220, 3 Phase	Yes	No	No
None	110	No	Yes (P/C)	No
None	110	No	Yes (P/C)	Yes
16 Work Stations	110	No	Yes (P/C)	Yes
35 x 35 x 16 (Req. Tank)	220	Yes	Yes (P/C)	Yes
35 x 35 x 16 (Req. Tank)	110	No	Yes (P/C)	Yes
Concrete Pad 45 x 12	440	Yes	No	Yes
Concrete Pad 45 x 12	440	Yes	No	Yes
Parking Area 100 x 40	15KW Generator	Yes	No	Yes
50 x 60 x 10	220	Yes	Yes (P/C)	Yes

CHAPTER 6

UNIQUE SUBMISSION REQUIREMENTS

INFORMATION PAPER

Purpose: To provide supplemental information to States, ARNG-ILI Facility Management Engineers, and ARNG-TRS, on Army National Guard Range planning, design, and construction.

1 General Discussion:

Planning, designing, and constructing an automated Army standard range generally follows the planning, design, and construction procedures outlined in NG Pam 415-5. However, there are some additional considerations and actions that are required for execution of a range project.

ARNG Ranges are included in the Army Master Range Program (AMRP). The AMRP is developed by the Department of the Army Deputy Chief of Staff for Operations (specifically DAMO-TRS) in coordination with the ATSC, Corps of Engineers, NGB, and the States (for ARNG Ranges). There are two additional, external organizations with whom the State will need to coordinate during design and construction. These organizations are:

- i. The Corps of Engineers Huntsville Division (the Mandatory Center of Expertise (MCX)) for range projects
- ii. The Army Training Support Center (ATSC) which is the Army's RTLP Program Coordinator for the Army Range Program.

2 Program Proponents are:

a. The ATSC Serves as the functional proponent for TC 25-1, Training Land and TC 5-8, Training Ranges, and related automated systems. They determine range and training land requirements resulting from changes to doctrine, force structure, and weapon system acquisition in coordination with HQDA (DAMO-TR). They provide assistance to NGB and the States for range issues. They develop and maintain the data base of record for the Army Master Range Plan (AMRP). They assist DA DCSOPS in developing estimated OPA funding (targets and instrumentation) requirements to procure instrumentation in MDEP program years. They consolidate MACOM submissions and provide RTLP targetry and device requirements to AMC for procurement and distribution for newly constructed ranges. They coordinate targetry installation and range construction completion schedules with the RTLP MCX and the AMC commodity manager. They participate in meetings and review designs for range projects to ensure training standards and requirements are satisfactorily met ICW the RTLP MCX. They schedule and conduct Construction Compliance Inspections (CCI) and the Targetry Interface Inspections (TII), and coordinate facility acceptance for range projects. Finally, they recommend stop work on design and construction activities to DA DCSOPS when appropriate.

b The Corps of Engineers MCX provides planning, programming, design and construction assistance for National Guard range projects. During the design, they can provide a contracting mechanism for design services. During range design, HQDA requires that they review every range for compliance with HQDA range standards. They coordinate with ATSC for the CCI's and TII's for ranges during construction.

Without appropriate coordination with these two above organizations, the Army can, and will likely, withhold centrally funded targetry. So, it is absolutely essential that every MCNG range project be reviewed and coordinated with these two organizations. Oversight of this coordination is a shared responsibility between the ARNG-ILI FME's and the ARNGTRS POC's. The discussion below will provide recommendations for this involvement.

3 Detailed Discussion: The following is a chronological list of actions and considerations that must occur for ARNG ranges in the Army Master Range Program.

a. Environmental. (Ref: 415-5, 5-1). Per 415-5, the environmental process should begin as early as practical. Range construction generally encompasses considerable earth disturbance (particularly those on land not previously used as a range). As such ranges often require at least an Environmental Assessment. The State should complete the ARNG Environmental Checklist and pay particular attention to those sections that pertain to earth disturbance as these areas may well adversely affect the environment. States should ensure that Environmental personnel assisting with the NEPA evaluation are aware of land disturbance and potential lead-related issues.

The TC 25-8, Appendix D contains a diagram of each range, from which the States can derive an estimate of the disturbance areas for various common ranges. This information includes only the target area. The actual amount of disturbance for specific range may be slightly higher than these amounts. In addition to the NEPA documentation required, there may be other permits (i.e., air, water, etc...) required by the jurisdiction in which the range will be constructed. It is always a good idea for States to have their environmental personnel create or review an environmental section in the specifications to ensure that all required actions are completed by the construction contractor.

b. Completion of DD Forms 1390/1391. (Ref: 415-5, 6-1 and 6-2). Automated Army standard ranges and Military Operations on Urban Terrain Ranges that are programmed through the AMRP require programming document review by the MCX and the ATSC. Usually, ARNG-TRS will accomplish this review in conjunction with their preparation for the RTLP Prioritization Board in October of each year. Therefore, there is no requirement for ARNG-ILI to send these programming documents to these two organizations. The NGB proponent for ranges is ARNG-TRS. Therefore, ARNG-ILI need only send the range programming documents to ARNG-TRS for validation and to NGB-ILE for information. ARNG-TR will validate the DD Forms 1390/1 and will provide comments regarding the range to ARNG-ILI.

Generally range DD Forms 1390/1 do not contain appropriately developed SDZ's. However, if they do, ARNG-ILI can send these along with the DD Forms 1390/1391 to

ARNG-TRS and they will staff the SDZ with ARNG-AV. DD Forms 1390/1391 for Army Standard Ranges that require targetry must have a detailed list of targetry elements in paragraph 12 b of the DD Form 1391c. ARNG-TRS will validate the targetry equipment via their reviews through ATSC and MCX. In addition to the targetry, there are a number of other elements that are slightly different for a range. Examples of range DD Forms 1390/1391 can be obtained from ARNG-ILI, ARNG-TRS or can be obtained from postings on GKO website in the Installations Division, DD Forms 1390/91 repository.

c. Project Planning Document Charrette (PPDC). Project Planning Document Charrettes (PPDC) are HIGHLY encouraged on range projects. At these meetings, all the stakeholders provide input, and changes to designs of targetry that are pending publication; these will certainly save on changes in design and construction change orders. Normally, if a good PPDC is completed, the project is at a point where the Conceptual Design is easily approved.

d.. Surface Danger Zones (SDZ). An SDZ is the ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems to include ammunition, explosives, and demolition explosives. In very simple terms, it is the volume in which a fired round will be statistically contained. The diagram of this area must accurately depict this space and must show that the projectiles, fragments, debris and components will not impact an inhabited area or proceed past the installation boundaries. Instructions for the construction of an SDZ are contained in DA Pam 385-63 and in NG Pam 415-5, 6-5, h. If the State has a baffled range, the state shall comply with NG Pam 415-5, 6-5, h (4) and use Picatinny Arsenal to conduct a ricochet analysis. Range Control personnel on the training center are ordinarily very skilled at generating SDZ's. GIS is a tremendous asset when generating these SDZ. Programs such as ARC Map are very useful for the generation of SDZ's. SDZ review can be conducted as early as during the DD Forms 1390/1391 submittal. Or, the SDZ can be submitted with the Preliminary design. If the designer generates the SDZ, the state should verify that that the SDZ is correctly constructed prior to sending the design to the NGB for review. The State (or designer) should develop the SDZ at no less than a 1:50,000 scale and submit a copy of this SDZ to ARNG-C (to their FME) for review and verification by ARNG-AV. Once ARNG-AV verifies the SDZ, they will send a memo to this effect to ARNG-ILI-C. The State should receive a copy of this verification and place it in the project file. SDZ for MOUT facilities and Gunnery Ranges are inherently complex. So States may want to schedule a time with ARNG-AV to review these SDZ's to make sure they are correct. A state should not proceed beyond 35% design without an SDZ approval (at least a preliminary approval).

e . Contracting for A/E Services. One option for A/E services is to contract through the Corps of Engineers, Huntsville Division. At an average management cost of less than 2%, the MCX will manage the design contract. The MCX has a multiple Task Order Contract with four design firms. You look at information from the four firms, select a firm, and the COE does the rest of the contracting piece. One advantage to this method is the ease of obligation of your funding (as simple MIPR is all that is required.) Please note that this may not be a viable method for ranges to be constructed on state

land if your Attorney General will not allow you to use Federal Contracting procedures

f . Design. All range designs must be reviewed by the MCX and the ATSC. To ensure that the States comply with this requirement, the FME's need to ensure that States send a copy of each design to ARNG-ILI, ARNG-TR (with a copy of the SDZ for ARNG-AV), ATSC, and the MCX. When ARNG-ILI receives the submittal, they will e-mail ARNG-TR, ATSC, and the MCX to establish a suspense date for their comments.

ARNG-ILI should require a copy of MCX and ATSC comments or a memorandum indicating that there are no comments from each of these organizations. To ensure that Designers are completely aware of their requirements to provide these copies and so that the time required for these reviews is incorporated into the design schedule, the following information are recommended to be included in each design contract for a range. The designer will be required to become familiar with the design requirements for the range they are designing. This includes, but it not limited to information from the Corps of Engineers (Huntsville Division) website, the Training Range project checklists for the inspections to be conducted during construction, and other information provided by the National Guard Bureau or the State regarding range design and construction.

The A/E will be required to submit additional copies of project designs throughout the design review process. These additional copies are for the organizations listed in "paragraph g" of this document, National Guard Installations Division, National Guard Bureau Training Division, and the National Guard Bureau Aviation Safety Office. (The state should determine whether the designer will send these design documents directly to these organizations or whether the designer will provide these submittals to the State to send. If the State determines that the A/E will send them directly, then the A/E will need to provide transmittal correspondence to all affected parties that indicate to whom they sent the review sets.).

The review process by these organizations will have about a 3 to 4 weeks duration. This period for design review will need to be incorporated into the design timeline for each design phase of the project in addition to review times already required by the State and the ARNG-ILI. Additionally, the cost to produce (and send (if indicated) these copies should be included in the design contract. If the designer is being retained to perform Title II, Type C Services, then they will be required to attend the Preconstruction Meeting, the Construction Compliance Review (normally about 4 hours), and the Target Interface Inspection (normally 6 - hours for a small arms range and 2 - 3 days for large range (such as a Multipurpose Training Range (Gunnery)). The current web references for range design is:

- (1) MCX Huntsville Corps of Engineers RTLP site has standard designs, 1390/91 examples and project management information posted at <http://www.hnd.usace.army.mil/rdg/InterTemplate.aspx>

The most critical part of the design process is the electrical and data interfaces that must be provided for the targetry to work and report back to the range computer properly. These documents have now been incorporated into the standard design package at the MCX website above.

g. Design Review mailing list. States will need to send the project design at the Conceptual 10% (planning), 35% (preliminary); 65% (preliminary) and 95% (pre-final); BFI (100 %) to each of the following organizations (in the format(s) as noted. The current mailing list is shown at the end of this chapter. The MCX has the lead at coordinating comments in Dr. Checks, and clearing all comments at the completion of the 95% review.

U.S. Army Training Support Center (ATSC)
ATTN: ATSC (RTLTP Team)
Building 1745, Jackson and 6th Streets
Fort Eustis, VA 23604
Telephone: 757-878-2320

Submittals: 1 Hard Copy & 1 CD for all reviews at 35% and 95%; BFI (100 %)

U.S. Army Engineering and Support Center, Huntsville (HNC)
ATTN: CEHNC-IS-TP
4820 University Square
Huntsville, AL 35816-1822
Telephone: 256-895-1528

Submittals: 3 Hard Copies & 1 CD for all reviews at 35 and 95%; BFI (100 %)

ARNG-TRS Ico (GWA)
91 Branscomb Road,
Suite 10 Green Cove Springs, FL 32043
Telephone: 904.589.9779

Submittals: 1 CD only. (For emergency distributions or to review other designs, an FTP site has been established)

(Small Arms Ranges Only)
Tank Automotive & Armament Command (TAACOM)
ATTN: AMSTA-LC-CTR
Building 104
Rock Island, IL 61299-7630
Telephone: 309-782-2428

Submittals: 2 Hard Copies & 1 CD for all small arms range reviews at 35 and 95%; BFI (100 %)

Instrumented (Digital-Armor) Ranges:

Program Manager - Training Devices (PM TRADE)
12350 Research Parkway
Orlando, FL 32826
Telephone: 407-384-3833

Submittals: 2 Hard Copies & 1 CD for all instrumented range reviews at 35, 65, and 95%; BFI (100 %)

Instrumented and Urban Operations Ranges Only:

U.S. Army Training Support Center (ATSC)
ATTN: Instrumented Ranges
Building 1745, Jackson and 6th Streets
Fort Eustis, Va 23604
Tel No. 757-878-2320

Submittals: 1 Hard Copy & 1CD for all reviews at 35 and 95%; BFI (100 %)

Urban Operations Ranges Only:
Program Manager - Training Devices (PM TRADE)
ATTN: SFAE-PEOSTRI-PMTRADE-DT
12350 Research Parkway
Orlando, FL 32826
Telephone: 407-384-3870

Submittals: 2 Hard Copies & 1 CD for all urban ops range reviews at 35 and 95%; BFI (100 %).

h. Construction. During the construction of a range there are three important meetings (two of which are required) that involve the State, NGB, MCX and ATSC. Failure by the State to conduct the required meetings can result in ATSC recommending that targetry not be installed at the affected range.

The first meeting is a “**Preconstruction Meeting**” that ensures that the contractor understands how critical the targetry interface items are. Although probably required by the contracting method used to construct the range, it is not required for attendance by ATSC and the MCX. Although a coordinated meeting is optional, it is highly desirable, especially for large and complicated ranges. This meeting sets the tone for contractor compliance with the construction contract, particularly strict adherence to the Target Interface Items and supporting elements. It is an excellent opportunity to expose the contractor to the range construction and targetry installation process. It aids tremendously in partnering through construction and target installation. The preconstruction meeting may be conducted on site (preferred), or at an alternate location. It can be conducted in coordination with the normal project preconstruction meeting.

The second meeting is a “**Construction Compliance Inspection**”. This required inspection is conducted when certain critical interface items are complete. These items include one target emplacement for each type of targetry (i.e. Stationary Infantry, Moving Infantry, etc...), and the network interfaces at the tower or range operations center. These inspections generally take about one day and must be conducted on site. The Corps of Engineers has generated a complete list of requirements for this inspection, and it is included in the standard design package referenced above. These

final inspections are a Target Interface Inspection (TII). This inspection is conducted when all targetry interface items are complete. These inspections generally take at least a day. It is not uncommon for them to take more than a day for complex ranges. The Corps of Engineers has generated a complete list of requirements for this inspection. To ensure that the contractor is aware of range-unique requirements and has accounted for their conduct in their bid, the following language should be added as a special provision to the construction contract.

“This project will result in the construction of a weapons range. When it is complete, centrally funded and acquired targetry will be installed on this range. To accommodate this installation of targetry, there are certain requirements during the construction of this range. The Contractor will be required to participate in a preconstruction meeting for this facility”

. A portion of this meeting will address the target interface requirements included in the construction contract. Two Army Agencies will attend this meeting and will emphasize the critical nature of the target interface items. If there is any discrepancy between information provided by either of these two agencies and the project contractual documents, the issue will be referred to the Contracting Officer for resolution. Generally about 1/3 of the way through the construction, the contractor will have completed at least one target emplacement of each type (i.e., one Stationary Infantry Target, Moving Infantry Target, etc...) and the tower interface. Once these items are within about 3 to 4 weeks of completion, the State will notify the National Guard Bureau to schedule a Construction Compliance Inspection. The focus of this inspection is to make sure that the items constructed thus far are in compliance with the Target Interface requirements. Again if there is any discrepancy between information provided by either of these two agencies and the project contractual documents, the issue will be referred to the Contracting Officer for resolution. When the project is about 4 weeks from completion of all of the Target Interface items (i.e. all the target emplacements, all target related electrical requirements in the tower), the State will notify the National Guard Bureau to schedule a Target Interface Inspection.

The focus of this inspection is to make sure that all of the Target Interface items are complete. There will probably be two additional agencies at this inspection. The first agency is the government agency that acts as the contracting agent for the targetry. The other agency will be the targetry installer. As with the other two meetings, if there is any discrepancy between information provided by either of these two agencies and the project contractual documents, the issue will be referred to the Contracting Officer for resolution. “ For current submittal (as of 05/27/2011) see Point of Contact below and the Matrix on Page 27.

i. Points of Contact:

- (1) National Guard Bureau.
 - (a) ARNG-TRS: – Training considerations – 904-589-9779
 - (b) ARNG-ILI-C (State POC): – 720-250-1361
 - (c) ARNG-AVS:– Range Safety POC – 703-607-7121
 - (d) ARNG-ILE: – 703-607-7969

- (2) Corps of Engineers (MCX)
U.S. Army Engineering and Support Center, Huntsville (HNC)
ATTN: CEHNC-IS-TP (POC's as below)
4820 University Square
Huntsville, AL 35816-1822
- (a) Program manager –, 256-895-1535
(b) Lead Engineer -, 256-895-1662
(c) Project Manager –256-895-1534
(d) Project manager –256-895-1528
- (3) Army Training Support Center, Building 1721, Ft Eustis, VA 23604
- U.S. Army Training Support Center (ATSC)
ATTN: ATSC (RTLTP Team)
Building 1745, Jackson and 6th Streets
Fort Eustis, VA 23604
Telephone: 757-878-2320

RANGE SUBMITTAL MATRIX

	PLANNING			DESIGN			BID FINAL SUBMITTAL
	PP/DC SUBMITTAL	CONCEPT SUBMITTAL	PRELIMINARY SUBMITTAL	PRE-FINAL SUBMITTAL	DESIGN	BID FINAL SUBMITTAL	
US ARMY TRAINING SUPPORT CENTER (ATSC) ATTN: (TOM-L) BOB SAUNDERS, TRADOC CAPABILITY MANAGER-LIVE BLD 2787 HARRISON LOOP JOINT BASE LANGLEY-EUSTIS, VA 23604 757-878-2320	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
US ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE (HNC) ATTN: CEHNC-IS-TP MAJ MARNIE SMEENK 4820 UNIVERSITY SQUARE HUNTSVILLE, AL 35816-1822 256-895-1716	0	3	3	3	3	3	3
	1	3	3	3	3	3	3
	0	3	3	3	3	3	3
	0	1	1	1	1	1	1
	1	1	1	1	1	1	1
THE ARMY NATIONAL GUARD READINESS CENTER ATTN: NGB-TRS-S MAJ GENE YORK 111 SOUTH GEORGE MASON DRIVE ARLINGTON, VA 22204 703-607-9792	0	0	0	0	0	0	0
	1	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	1	1	1	1	1	1
	1	1	1	1	1	1	1
GOLDEN, WEISE AND ASSOCIATES, LLC ATTN: CLIFF WEISE 91 BRANSCOMB ROAD, STE 10 GREEN COVE SPRINGS, FL 32043 904-588-9779	0	0	0	0	0	0	0
	1	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	1	1	1	1	1	1
	1	1	1	1	1	1	1
US ARMY TACOM-LCMC ATTN: AMSTA-LCW-SMT KEVIN COLLINS 6601 E. ELEVEN MILE ROAD MAIL STOP 326 WARREN, MI 48397-5000 586-282-8297	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	0	0	0	0	0	0
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
ARDEC (TACOM) - ROCK ISLAND ARSENAL ATTN: JOSEPH RAMBOUSEK RDAR-EI-S-OM, BLDG 62, 2ND, SE ROCK ISLAND, IL 61299-7300 309-782-0625	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
PROGRAM MANAGER - TRAINING DEVICES (PM TRADE) ATTN: TIM WARD 12350 RESEARCH PARKWAY ORLANDO, FL 32826 407-384-3588	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
PROGRAM MANAGER - TRAINING DEVICES (PM TRADE) ATTN: JEANETTE PEREZ 12350 RESEARCH PARKWAY ORLANDO, FL 32826 407-384-5143	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1
	0	1	1	1	1	1	1

CHAPTER 7

UNIQUE DESIGN REVIEW DIRECTIVES REQUIREMENTS

TADDS Facility Power and Space Requirements

Abrams – Full-crew Interactive Simulation Trainer (A-FIST)	Area	20' W x 40' L x 16' H environmentally-controlled area (800 sq ft)
	Power	One 110 volt, 20 amp circuit and one 220 volt, 20 amp circuit
Full-crew Interactive Simulation Trainer - Bradley (FIST-B)	Area	20' W x 40' L x 16' H environmentally-controlled area (800 sq ft)
	Power	One 110 volt, 20 amp circuit and one 220 volt, 20 amp circuit
Engagement Skills Trainer 2000 (EST2000)	Area	Minimum: 30' W x 45' L x 10' H room (1,350 sq ft) Optional: 35' W x 45' L x 10' H room (1,575 sq ft)
	Power	Three 110 volt, 15 amp circuits
Distance Learning Classroom	Area	20' x 22' room – minimum (440 sq ft) 25' x 35' room – optional (875 sq ft)
	Power	Three 110 volt, 20 amp circuits (min) Ten 110 volt, 20 amp circuits (max)
	Commo	Minimum: Two telephone lines (min) Optional: Two telephone lines, one ISDN line, and one T-1 line
		IAW MMS-600 Site Planning and Preparation Guide (241SF + # workstations * 44 SF ea = Authorized SF)
Guard Unit Armory	Area	8' x 8' area (64 sq ft)

Device Full-crew Interactive Simulation Trainer (GUARDFIST II)	Power	One 110 volt, 15 amp circuit
Guard Unit Armory Device Full-crew Interactive Simulation Trainer (GUARDFIST IIA)	Area	Minimum: 25' W x 45' L x 13' H tiered room (1,125 sq ft) Optional: 30' W x 50' L x 13' H tiered room (1,500 sq ft)
	Power	One 1-phase 220 volt, 30 amp circuit
Fire Support Combined Arms Tactical Trainer (FSCATT)	Howitzer Crew Trainer (HCT)	
	Area	33' x 35' and 16' high if indoors (1,155 sq ft) 50 yards LOS for aiming circle
	Power	One 3-phase, 220 volt, 100 amp circuit
	Howitzer Strap on Trainer (HSOT)	
	Area	Outdoor/Indoor area to support Howitzer 50 yards LOS for aiming circle
	Power	Vehicle supplied
	Instructor/Operator Station	
	Area	10' x 10' environmentally-controlled area
	Power	One 110 volt, 15 amp circuit
	Mobile - Close Combat Tactical Trainer (M-CCTT)	Area
Power		Trainer supplied
Conduct of Fire Trainer (COFT)	Area	Unit-COFT- 25' W x 34' L x 6" concrete pad
		Mobile-COFT- 30' W x 60' L x 6" concrete

		pad
	Power	One 3-phase 408 volt power supply
ARPA Reconfigurable Simulation Initiative (ARSI)	Area	24' W x 16' L x 10' H room per platoon (1,856 sq ft)
	Power	Twenty-eight 110 volt, 20 amp circuits and eight 220 volt, 30 amp circuits
JANUS	Area	2,000 sq ft indoor area
	Power	Six 110 volt, 20 amp circuits
Virtual Convoy Operations Trainer (VCOT)		
Building-based System:		
Appended Trainer (HMMWV)	Area	Minimum: 15' W x 20' L x 12' H (300 sq ft) Optional: 20' W x 25' L x 15' H (500 sq ft)
	Power	
Crew Station Trainer	Area	Minimum: 15' W x 25' L x 10' H (375 sq ft) Optional: 20' W x 30' L x 12' H (600 sq ft)
	Power	
Tabletop Trainer	Area	Minimum: 7' W x 7' L x 8' H (49 sq ft) Optional: 9' W x 9' L x 8' H (81 sq ft)
	Power	
Tabletop Instructor/Operator Station w/AAR	Area	Minimum: 7' W x 7' L x 8' H (49 sq ft) Optional: 9' W x 9' L x 8' H (81 sq ft)
	Power	
AAR Area (Recommended)	Area	Minimum: 12' W x 15' L x 8' H (180 sq ft) Optional: 15' W x 20' L x 8' H (300 sq ft)
	Power	

Trailer-based System	Area	16' W x 56' L concrete pad (896 sq ft) with adjacent (within 100') covered area for HMMWV
	Power	
Computer-based Systems:	Area	8' x 8' (64 sq ft)
Battle Staff Training System (BSTS)	Power	One 110 volt, 15 amp circuit
Virtual Maintenance Trainer (VMAT)		
Virtual Medical Trainer		
Digital Systems Test and Training Simulator (DSTATS)		
MLRS Fire Control Panel Trainer		

CHAPTER 8
TRAINING FACILITY DESIGN DOCUMENT

RECOMMENDED: Training Facility Design Document for the Virtual Trainer is:

FATS Virtual Trainer
Version 1.2
3 June, 2011

PREPARED BY:

FATS, Inc.
7340 McGinnis Ferry Road
Suwanee, Georgia 30024, U.S.A.

Tel: (770) 813-0180
Fax: (770) 813-0741

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CHAPTER 8

TRAINING FACILITY DESIGN DOCUMENT

8-1 INTRODUCTION.

This Training Facility Design Document contains information to be used in the planning stages for construction of a training facility for housing the FATS Virtual Trainer.

8-2 PREPARING THE TRAINING FACILITY

8-2.1 GENERAL FACILITY LAYOUT

This section provides information that is required for preparing the site for installation and operation of the FATS Virtual Trainer in the single and multiple screen configurations. FATS recommends a facility layout that includes a Training Room(s), Weapon Storage Room, Compressor Room, and Office.

- **Training Room** - All training will be conducted in the Training Room, which houses all simulation equipment.
- **Weapon Storage Room** - The Storage Room provides for simulated weapon storage.
- **Compressor Room** – The compressor room houses the air compressor, and/or the carbon dioxide (CO₂) bottles providing compressed air or CO₂ for weapon recoil of non-Bluefire weapons.
- **Office** - The office provides a work base for the Training Facility manager.

8-2.2 TRAINING ROOM.

8-2.2.1 Overview – Training Room.

The Training Room(s) will house the Virtual Trainer, a system operator, 1-3 instructors, and observers. A diagrammatic layout is in Attachment A.

8-2.2.2 Size Requirements – Training Room.

Training Rooms should measure 45' x 25' (13.716m X 7.62m) for a single screen system. (Minimum requirements for a single screen system are 15' x 30' / 4.572m x 9.144m) If multiple systems are being utilized, the room dimension will increase. Refer to Attachment A. The physical dimensions of the Training Room should be sufficient to accommodate a 5/10/15-lane Virtual Trainer with an Instructor Station, firing line for trainees, projector, screen, speakers, and training furniture. Training room dimensions must take into account the critical placement of FATS system components relative to each other as identified in the facility diagrams in Attachment A. For example, the projector must be placed a distance of 230" (5.842m) from the screen, while the firing line must be located 20' (6.069m) from the screen. Placement of other system components can be customer defined, as long as maximum cable lengths are not exceeded and proper line of sight is maintained from the instructor to student and

projection screen. FATS suggest an optimal placement for the Instructor's Station and the associated hardware and controls as indicated in the facility diagrams in Attachment A. That location will allow the instructor to have an unobstructed view of the screen and the firing line, and at the same time have access to the room electrical controls such as thermostat, fluorescent and dimmable lights. If the customer desires a different location, please discuss the desired new location with FATS to avoid potential problems.

Please Note: If Mortars or a Mk-19 are being used on the system, please allow approximately 4' x 4' (1.2192m X 1.2192m) for the Mortar/MK-19 platforms.

The projector distance may vary depending on the model purchased. Check with FATS, Inc. for specific distances for your projector.

8-2.2.3 Flooring Requirements – Training Room.

It is recommended that a 2' (0.6096m) raised firing platform be constructed for the trainees. It should be made out of solid wood or another material that minimizes vibrations due to people walking and moving about on the floor since vibration can adversely affect the shooters performance. The firing platform should have a crawl space underneath it to allow for running system cables and hoses to reduce clutter. It should also have openings at the indicated locations for the projector and for access to the crawl space. In this configuration, all weapon umbilicals run to the front of the firing line, eliminating floor clutter. Speaker and intercom cables can also be routed to positions in front of the firing line where they do not interfere with the trainee's view of the screen. The Training Room floor should be smooth and level to within 1" (.0254m) between any two points. The Training Room floor, including the firing platform, should be covered with short, closed pile, anti-static, textured dark gray or black commercial carpet. Carpet controls dust and feels more like the ground when firing from a prone position. It is especially important to have the floor carpeted or covered with rubber mats when using Bluefire weapons where the magazines or weapon itself, such as the OC spray, are allowed to fall on the floor to simulate reloading or out of chemical drills.

Please Note: In the floor mount configuration, the bottom of the screen and the projector should be at the same level. In the ceiling mount configuration, the top of the screen and the projector (inverted) should also be at the same level.

8-2.2.4 Ceiling Requirements – Training Room.

The minimum height of the ceiling in the training room should provide sufficient room to raise the screen. Add an additional 2' (0.6096m) for the raised platform making the top of the screen 10'-12' (3.048m – 3.657m) off the floor. The ceiling should be painted flat black to match the walls and eliminate light reflection.

Please Note: The Ceiling will need to be higher if ceiling mounts are used and may add another foot to the overall ceiling height. If a ceiling mount for the projector is being used, please ensure the mount hangs at the same level as the TOP of the screen and centered left to right.

8-2.2.5 Door Requirements – Training Room.

One rear entry door should be provided to provide for personnel access to the Training Room. This door should be electric/key unlock (normally locked), solid, sound attenuating. Door will lock only from outside. This personnel access door should be an interior door to minimize potential exterior noise, environmental conditions, and debris. All FATS equipment is designed to fit through standard door openings. There should be no light passing through the door when closed (i.e., no light transmission detected in darkened Training Room when viewing door using standard night vision device). Ideally, no light should reflect on the screen when any outside doors are opened. Please check with local fire/evacuation regulations.

8-2.2.6 Wall Finish Requirements – Training Room.

All walls in the Training Room should be painted with “flat” black paint to minimize light reflections that could interfere with the Virtual Trainer hit detect system.

8-2.2.7 Window Restrictions – Training Room.

For new facilities, no windows should be included in the Training Room. If there are windows present, make sure they are completely sealed so “NO” ambient/natural light can pass through.

8-2.2.8 Environmental Requirements – Training Room.

The FATS Virtual Trainer is designed for indoor use, and is typically operated in room temperatures that are adjusted to personnel specifications. Air conditioning is recommended for temperature and humidity control (controllable via dedicated thermostat). The heat load from the two-system Virtual Trainer is equivalent to that of 3 office PCs, a monitor, 2 projectors, sound amplifier and a printer, and the total power would not exceed 1400w. The training room environment should maintain temperatures and climate that is within the operating range of the training system. The safe operating temperature limits for the Virtual Trainer system are between +5 and +35 degrees Centigrade (or +41 to +95 degrees Fahrenheit). The relative non-condensing humidity limits are 20 to 85 percent. The Virtual Trainer is designed to operate successfully in a wide variety of climates and conditions. Still, avoid dust-producing items (leaking sandbags, dirt floors, deteriorating camouflage materials, etc) especially around the desks, projectors, and weapons. Excess dust can be damaging to Virtual Trainer components. Access to the Training Room should prevent wind-blown dust or precipitation from entering the room via poorly sealed doors or windows. For existing facilities, moisture producing items such as leaking or sweating pipes and damaged roofs must be repaired. Please note that air conditioning vents should not be placed near Virtual Trainer projection screens, since slight movements or ripples in the screen surface can reduce overall system accuracy. Any source of IR light such as Exit signs or heaters should not be placed near the screen where it is in the field of view of the hit cameras.

BLUEFIRE WEAPON INFORMATION

If Bluefire weapons are to be used, then excessive RF (radio frequency) from devices not FCC approved should be avoided. Bluefire operates using Bluetooth technology in the 2.4 GHz frequency range. The training room should be in a location where wireless devices can be used. If there are known RF interferences that prevent other devices in

the 2.4 GHz spectrums such as cordless phones, wireless computer networks or other Bluetooth devices from operating properly, then the room must be RF shielded. Please contact FATS, Inc for more details.

8-2.2.9 Sound Insulation Requirements – Training Room.

The simulated firing audio system is fitted with a volume control to adjust the audio volume level for weapon shot sounds, battlefield sounds, and normal scenario feedback. When training is being conducted, the sound of the simulated weapons and scenario sounds should be loud enough for realism. However for safety purposes, the audio volume of the Virtual Trainer is designed not to exceed a peak exposure (generally shot sounds) of 110 dBA to prevent damage to the operator and/or trainee's hearing.

The level of noise that escapes from the Training Room during operation depends on the amount of sound insulation materials used in construction of the facility (dry wall, sound lagging, insulation materials, thickness of walls and bulkheads, etc.). An air conditioned facility and use of normal building materials typically are adequate to reduce noise (shot sounds, etc) from the trainer to building exterior.

8-2.2.10 Power Requirements – Training Room.

The FATS Virtual Trainer operates using 100-240 VAC, 50-60 Hz power. The Virtual Trainer will auto switch, but there are some components that may need to be changed by a FATS Technician prior to installation. A 100–240 VAC Transformer may also be supplied with the system.

- 1) **Instructor Station Power** - dedicated filtered circuit (i.e., Virtual Trainer power should be isolated from power circuits supplying other equipment within the facility) 100-240 VAC, 50-60 Hz, 15A single phase - outlet mounted on the wall within six feet of the Instructor Station (preferably at the location indicated on the facility layout drawings in Attachment A), at 3' off the room floor (1' above the firing platform).
- 2) **Other Power** – 100-240 VAC, 50-60 Hz, 15A single phase outlets on separate circuits evenly spaced around the room for use with maintenance and miscellaneous equipment (circuits isolated from system circuits).

A single point of ground (earth) shall be provided for the entire AC system. Ground impedance shall be less than one ohm measured at any outlet or connecting device.

8-2.2.11 Telephone Line Requirements – Training Room.

Two analog telephone lines are recommended for use in system upgrades and remote diagnostics by FATS, Inc. Provision of telephone lines is desirable to support file and scenario transfer rates used in HLA.

8-2.2.12 Lighting Requirements – Training Room.

A common problem with many customer simulator-training rooms is that they are either too dark or too bright. This comes from having little or no control over ambient (room) lighting, or from having lights in the wrong locations. To maximize projected image clarity and saturation and eliminate interference with laser hit detect sensor, Training Room lights in the area of the projector and screen must be turned OFF to keep this

area in deep shadow. While this reduced light level aids the Virtual Trainer projection system, it potentially limits both the trainee on the firing line and operator at the instructor station. Low light levels at the firing line make it difficult for trainees to fill out score notebooks or easily see weapon sights. In addition, the Virtual Trainer operator is forced to work in darkness, making it difficult to impossible to effectively review training aids. Therefore, dedicated recessed (focused) dimmable lighting is important for lighting the firing line and the Instructor Station position. It is best for all room lighting to be adjustable by the operator from the Instructor Station location. Proper use of operator-controlled lighting enables use of different light levels within the Training Room, allowing screen images to remain sharp and clear while enabling the trainees and operator to see what they are doing. During simulator operation, recessed dimmable fluorescent, compact fluorescent or low IR lights are recommended for use over the firing line and instructor station. Any other kinds of light such as halogen and incandescent lights generate significant amounts of IR light that can potentially interfere with the system's hit detection. For general room lighting when the simulator is not in use, standard florescent lights are acceptable. It is preferable if the fluorescent lights are separated in front of the firing platform and are on a separate bank from the ones over the firing platform.

8-2.2.13 Furniture Requirements – Training Room.

Training room size should be sufficient to support use of additional training furniture such as simulated sandbags, camouflage netting, trenches, etc. These items are not part of the contract, and would be constructed and installed by the customer. If desired, FATS can discuss things accomplished by other customers in this area.

8-2.2.14 Air Flow Specifications – Training Room.

The FATS system can use Compressed Air, CO₂ or Nitrogen (N₂) for simulated weapon recoil, therefore no smoke or poisonous gases will be discharged from the simulated weapons. FATS simulated weapons can operate using CO₂ canisters. Compressed air can also be used as a cost option. If compressed air is used, it must be dry and filtered to prevent contamination. Another issue with compressed air or nitrogen is that they will not last as long as the CO₂ because they are stored as a gas where the CO₂ is stored as a liquid and turns into a gas replenishing the gas supply. Facility airflow should be designed to support training room occupancy for up to 12 trainees, 1-3 instructors, and observers simultaneously.

8-2.2.15 Cable Routing Requirements – Training Room.

The cables from the equipment rack to the projector and hit camera, as well as the trunk lines for the weapons will run underneath the firing platform. It is required that a 6” (0.1524m) diameter hole is cut out in the firing platform behind the equipment rack. If a raised platform cannot be used, it is recommended that floor tunnels be used to hide cables. If a good tunnel structure exists, there should not be a need for a raised platform.

8-2.3 WEAPONS STORAGE ROOM.

8-2.3.1 Size Requirements - Storage Room.

The size of the Storage Room should be sufficient to store training furniture and simulated weapons (unless stored in another secured lockup area) when not in use. Actual size of this room is left to the discretion of the customer – no formal requirement exists relative to the operation of the Virtual Trainer.

8-2.3.2 Power Requirements - Storage Room.

There are no special power requirements for the Storage Room. However, it is recommended to add a couple of power outlets to this room for future use (easier and cheaper to add now than later). If **Bluefire** weapons are to be used, power outlets are required for the battery chargers to charge up the batteries inside the weapon simulator overnight. It is important to keep the Bluefire weapons, like with any battery-powered device, charging when not in use to ensure the weapons are operational at a moment's notice.

8-2.3.3 Environmental Requirements - Storage Room.

Since system equipment will be stored in the Storage Room, this room should be heated and cooled in a similar manner as the rest of the facility.

8-2.3.4 Lighting Requirements - Storage Room.

General-purpose lighting should be provided for the storage room.

8-2.3.5 Access – Storage Room.

The Storage Room should easily accessible from the Training Room. Double doors identical to the ones used for the training room are recommended to facilitate easy movement of equipment in and out of the Weapon Storage Room. The room's doors and windows (if present) should be compliant with customer's standards for storage of simulated weapons.

8-2.4 COMPRESSOR ROOM (FOR TETHERED WEAPONS).

8-2.4.1 Size Requirements – Compressor Room.

The size of the Compressor Room should be sufficient to house the compressor skid-mounted assembly if purchased by the customer.

8-2.4.2 Power Requirements - Compressor Room.

There are no special power requirements for the Compressor Room. However, it is recommended to add a couple of power outlets to this room for future use (easier and cheaper to add now than later). If the customer purchases a separate air compressor, the proper power requirements will need to be adhered to in accordance with the manufacturer of the air compressor.

8-2.4.3 Environmental Requirements - Storage Room.

It is recommended that this room should be heated and cooled in a similar manner as the rest of the facility especially since it will house the Co2 canisters.

8-2.4.4 Lighting Requirements - Storage Room.

General-purpose lighting should be provided for the storage room.

8-2.4.5 Access – Compressor Room

The Storage Room should easily accessible from the Training Room. If the customer purchases a compressor, the access to the room should be through double-doors with a minimum width of at least 6' to allow for the compressor skid to be moved in the room. In the interest of safety, only authorized personnel should have access to this room.

8-2.5 OFFICE.

An office is recommended for the Training Room manager. This office will be used for Training Room scheduling and general management activities. Size, access, furnishing, and environmental control of this office are left to customer discretion.

8-2.6 SAFETY CONCERNS: ALL SAFETY ISSUES NEED TO BE ADDRESSED LOCALLY BY THE CUSTOMER. SOME OF THE SAFETY CONCERNS ARE:

- Steps in the training area should be lighted to prevent students from tripping.
- Exposed Cables/hoses could be a possible trip hazard.
- CO₂/Nitrogen canisters need to be secured so they don't fall or get knocked over.
- Fire extinguisher should be available.
- Exit lighting
- Emergency shutoff
- Every weapon needs to be treated as a live weapon.

Note: More safety concerns are also covered in the System O&M Manual.

8- 2.7 BLUEFIRE WEAPONS

Bluefire weapons with recoil require the use of a magazine refill station. This station occupies about 1 cubic feet of space and should be set on a sturdy table and nearby the firing line in order for students to easily refill their magazines to minimize down time. This station requires a Nitrogen canister that needs to be provided by the customer. FATS recommend our customers rent this canister and have a service that fills the canister on a regular basis depending on usage. The canister is the tall kind (that weighs over 200 lbs) and requires it to be strapped down or in a rolling rack to prevent it from falling over and causing a potential hazard. The specifications of the canister should be as follows.

Canister/tank pressure: 5000-6000 PSI

Fitting: CGA-677

Gas: High Pressure Nitrogen

Bluefire weapons have a range of about 33 feet from the weapon's dongle (transceiver unit that allows the wireless communication between the weapon and the system), which plugs into the FATS simulation computer. The dongle currently has a cable length of about 25 feet with a connector that plugs into the weapon port of the FATS computer. For optimal performance, it is recommended that each dongle be placed in the center of the projected area in front of the firing line closer to the screen than the

firing line. If there is going to be a lot of anticipated movements where the students can potentially trip over the cables, then the dongle can be mounted in the ceiling or be used with a weapon trunkline so that the cable run alongside the sides of the room and out of the way of the students.

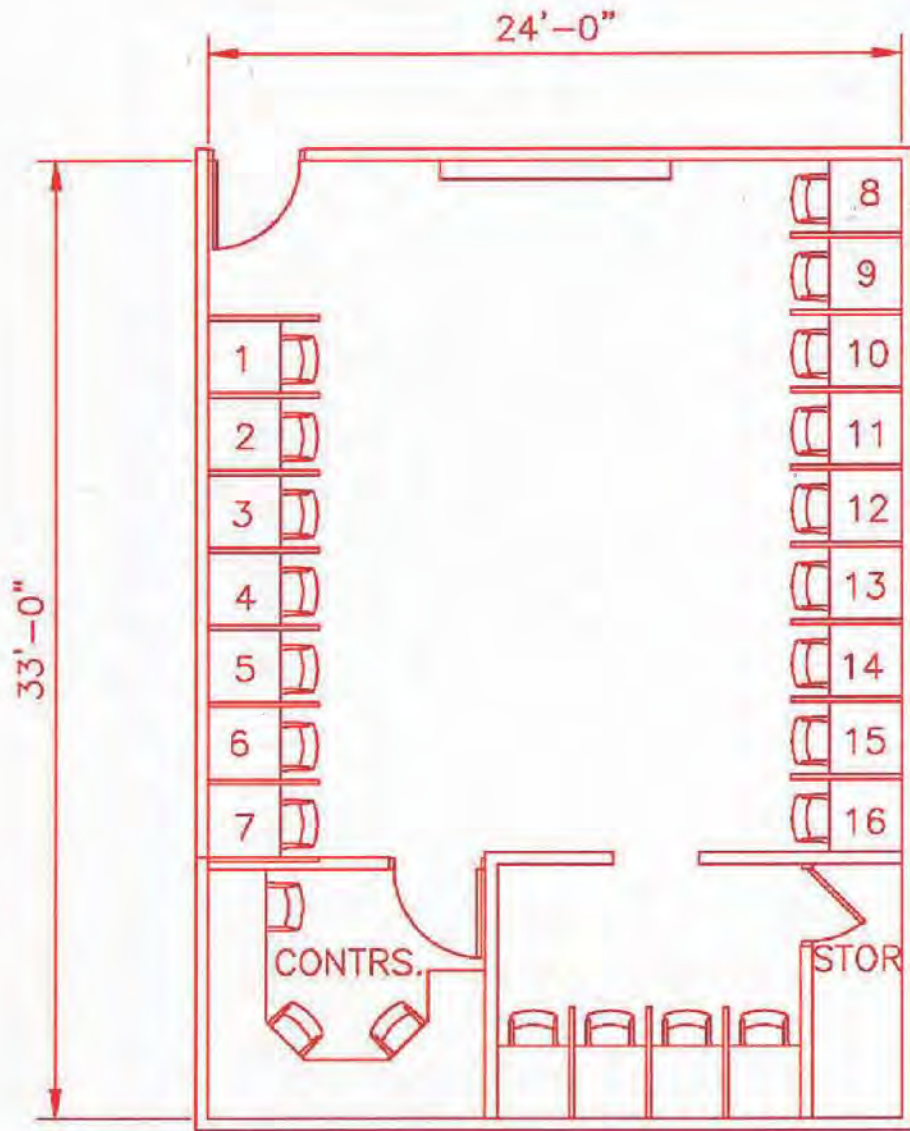
Since Bluefire weapons look very similar to its live weapon counterpart, it is imperative that there is some kind of policy or procedure in place to prevent live weapons from entering into the FATS training room and Bluefire weapons from leaving the training room. This may include a lockable cabinet for students to check in their live weapons before going into the FATS Training room.

If there are to be any props for students to practice cover drills with, it is recommended to avoid all metal props or dividers because metal has a tendency to limit the range of any wireless link by shielding the RF signals. This can cause problems in the operation of the weapon and system.

See Attachment A JANUS SIMULATED CLASSROOM

REFERENCES:

Department of the Army Pamphlet 415–28



JANUS SIMULATION CLASSROOM

792 SF

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APPENDIX A

UNIQUE REFERENCES

The following lists criteria in the form of regulations and industry standards that are to be used to design ARNG training site facilities and are not included in the References in DG 415-5. The design A-E should use the current applicable edition of all references.

GOVERNMENT PUBLICATIONS:

Unified Facilities Criteria

UFC 4-171-02A U.S. Army Service Schools
UFC 4-722-01 Dining Facilities
UFC 4-860-03FA Railroad Track Standards
UFC 1-900-01 Methods for Reuse,
Recycling

Department of Justice

2010 ADA Standard for Accessible
Design

NON-GOVERNMENT PUBLICATIONS:

APPENDIX B

GLOSSARY

B-1 ACRONYMS AND ABBREVIATIONS

A-E	architect-engineer
ARNG	U.S. Army National Guard
AT	annual training
AV	audio/visual
BEQ	bachelor enlisted quarters
BIIL	basic issue items list
BOQ	bachelor officer quarters
CFMO	construction and facilities management officer
CO	commanding officer
DG	design guide
E6	staff sergeant
Ft	foot/feet
HVAC	heating, ventilation, and air-conditioning
IDT	inactive duty training
in.	inch(es)
LF	linear feet
LTA	local training area
MOSQ	military occupation specialty qualification
MTA	major training area
ARNG-ILI	National Guard Bureau, Army Installations Division
STC	sound transmission classification
TDA	table of distribution and allowances

TISA	troop issue subsistence activity
TOE	table of organization and equipment
Yd	yard(s)

B-2 UNIQUE SPECIALIZED TERMS

Billet	A lodging for troops
cantonment	A group of more or less temporary buildings for housing troops.
Consolidated Facility	A building in which several functions of a cantonment area facility are combined.
Local Training Area (LTA)	Land and facilities to support ARNG troops during weekend inactive duty training and, in rare cases, two-week annual training. An LTA may comprise two operational land areas: 1) the cantonment area and 2) the location of the bivouac areas, ranges, and special training structures.
Major Training Area (MTA)	Land and permanent or semi-permanent facilities (including billeting, dining facilities, ranges, bivouac areas, special training structures, administrative and other logistic buildings, and tank trails) to support ARNG troops during training and/or inactive duty training.
Troop Issue subsistence activity (TISA facility)	A facility for stocking all perishable and nonperishable items needed to supply the dining facilities or field kitchens operated at an MTA.

APPENDIX C

TABLES

Table 1.	Proximity Requirements for an Educational Facility
Table 2.	Architectural Interior Finishes
Table 3.	Doors, Hardware, Storage, and Shelving
Table 4.	Mechanical Requirements – Part 1
Table 5.	Mechanical Requirements – Part 2
Table 6.	Electrical Requirements
Table 7.	Special Equipment and Ceiling Heights

Table 1. Proximity Requirements for an Educational Facility

	General Administration	Medical/Aid Station	Supply	Publication Storage	Material Reproduction/Mail Ctr.	Weapons/Ammunition Storage	Toilets/Showers/Lockers	Classrooms	Instructor Preparation/Counsel.	Multi-Purpose Training Area	Auditorium	Library	Learning Center	Distance Learning Center	Training Device/Simulation Ctr.	Training Aid Storage	Audio Visual Storage	Test Control Storage	Break Area	Physical Fitness	Toilets	Dining Area & Kitchen	Billeting
General Administration	2	1	1	1	3	3	2	2	2	2	2	2	2	2	2	N	N	N	2	3	3	3	3
Medical/Aid Station	2	N	N	N	N	N	2	N	N	N	3	3	3	3	3	3	N	N	2	2	2	3	2
Supply	2	N	1	2	3	N	N	N	N	N	3	3	3	3	3	N	N	N	N	N	N	3	3
Publication Storage	2	N	1	2	N	N	N	N	N	N	3	3	3	3	3	N	N	N	N	N	N	3	3
Material Reproduction/Mail Ctr.	2	N	1	2	N	N	3	N	N	3	3	3	3	3	3	N	N	N	N	N	N	3	3
Weapons/Ammunition Storage	3	3	N	N	N	N	3	3	3	3	3	3	3	3	3	N	N	N	3	3	3	3	3
Toilets/Showers/Lockers	2	2	N	2	N	N	1	2	1	1	2	2	2	2	2	N	N	N	2	1	2	2	2
Classrooms	3	N	3	3	3	3	3	1	2	2	2	1	1	1	1	1	1	1	2	3	2	3	3
Instructor Preparation/Counsel.	3	N	3	3	3	3	1	N	2	2	1	1	1	1	1	1	1	1	2	3	2	3	3
Multi-Purpose Training Area	3	N	3	3	3	2	1	1	2	2	1	1	1	1	2	2	N	2	3	2	2	3	
Auditorium	3	N	3	3	3	3	2	N	2	2	3	N	N	N	N	N	N	2	3	1	3	3	
Library	3	N	N	3	3	3	2	2	2	3	3	1	1	1	1	N	N	N	3	3	2	3	3
Learning Center	3	N	N	3	3	3	1	1	2	N	1	1	1	1	1	1	1	1	2	3	2	3	3
Distance Learning Center	3	N	N	3	3	3	1	1	2	N	1	1	1	1	1	1	1	1	2	3	2	3	3
Training Device/Simulation Ctr.	3	N	N	3	3	3	1	1	2	N	1	1	1	1	1	1	1	1	2	3	2	3	3
Training Aid Storage	N	N	N	N	N	N	1	2	2	N	N	1	1	1	1	1	1	1	N	N	N	N	N
Audio Visual Storage	N	N	N	N	N	N	1	2	1	2	2	1	1	2	1	1	1	1	N	N	N	N	N
Test Control Storage	N	N	N	N	N	N	1	1	1	N	N	2	2	2	2	2	2	2	N	N	N	N	N
Break Area	2	N	N	N	N	N	2	2	2	2	2	N	N	N	N	N	N	N	N	2	2	N	N
Physical Fitness Area	3	N	N	N	N	1	3	3	2	3	3	3	3	3	3	N	N	N	2	2	2	N	N
Toilets	2	N	N	N	N	3	2	2	1	1	2	2	2	2	2	N	N	N	2	3	2	2	N
Dining Area & Kitchen	3	3	3	3	3	N	3	3	3	3	3	3	3	3	3	N	N	N	3	2	2	2	2
Billeting	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2

Functional Relationship Requirements

1 Immediate 2 Close 3 Isolated N Neutral

All designated areas are from NG PAM 415-12, Table 6-1.

Table 2. Architectural Interior Finishes

	FUNCTIONAL AREA	FLOOR	BASE	WAINSCOT	WALLS	CEILING*
Administration						
1	General Administration	CPT	RB	Epoxy (Note 2)	GWB/P	ACST
2	Medical/Aid Station	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
3	Supply	VCT	RB	--	GWB/P	ACST
4	Publication Storage	VCT	RB	--	GWB/P	ACST
5	Material Reproduction/ Mail Center	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
6	Weapons/Ammunition Storage	CONC/H		Epoxy (Note 2)	GWB/P	ACST
7	Toilets/Showers/Lockers	CT	CT	CT	CT (Note 3)	GWB/P
Education						
1	Classrooms	CPT	RB	Epoxy (Note 2)	GWB/P	ACST
2	Instructor Preparation/ Counseling	CPT	RB	Epoxy (Note 2)	GWB/P	ACST
3	Multi-Purpose Training Area	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
4	Auditorium	CPT	RB	Epoxy (Note 2)	GWB/P	GWB/P
5	Library	CPT	RB	Epoxy (Note 2)	GWB/P	ACST
6	Learning Center	CPT	RB	Epoxy (Note 2)	GWB/P	ACST
7	Distance Learning Center	CPT	RB	Epoxy (Note 2)	GWB/P	ACST
8	Training Device/ Simulation Center	CONC/H		Epoxy (Note 2)	GWB/P	ACST
9	Training Aid Storage	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
10	Audio/Visual Storage	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
11	Test Control Storage	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
12	Break Area	VCT	RB	Epoxy (Note 2)	GWB/P	ACST
13	Physical Fitness Area	(Note 1)	RB	Epoxy (Note 2)	GWB/P	ACST
14	Toilets	CT	CT	CT	GWB/P	GWB/P
Dining Facility						
1	Dining Area	VCT	RB	Epoxy (Note 2)	GWB/P	GWB/P
2	Kitchen	QT	QT	QT	GWB/P	GWB/P
Billiting						
1	Living/Sleeping Area	CPT	RB	Epoxy (Note 2)	GWB/P	GWB/P
2	Toilet/Shower	CT	CT	CT	CT (Note 3)	GWB/P

*Ceiling heights are indicated in Table 7.

TABLE 2 – ABBREVIATIONS

ACST	acoustical suspended tile, 2 ft by 4 ft or 2 ft by 2 ft
CMU	concrete masonry unit
CONC/H	clear liquid hardener/sealer finish over exposed concrete floor
CPT	carpet - A 26 to 28 oz. (face weight), permanent static-free (2.5 kV or less), cut or loop pile nylon or acrylic commercial-grade.
CT	ceramic tile (thick or thin set) and ceramic or marble threshold
GWB/P	gypsum wallboard, painted (using enamel, latex, or paint of an equivalent cost)
QT	quarry tile
RB	resilient base
VCT	vinyl composition tile – VCT with a thickness 3/16 in. or less) on monolithic concrete finish and with a final wax coat, if recommended by the tile manufacturer authorized.

TABLE 2 – NOTES

1. Rubberized athletic flooring with flexible strength meeting OSHA recommendations of 0.5 Standard coefficient of friction per ASTM D-2047.
2. Epoxy is the base paint (coating not to exceed two-application system).
3. Ceramic tile walls in shower area should extend to the ceiling.

Table 3. Doors, Hardware, Storage, and Shelving

	FUNCTIONAL AREA	DOORS	HARDWARE	STORAGE/ SHELVING
Administration				
1	General Administration	solid core wood	commercial/keyed	N/A
2	Medical/Aid Station	solid core wood	commercial/keyed	cabinets (lockable)
3	Supply	solid core wood	commercial/keyed	shelving & cabinets
4	Publication Storage	solid core wood	commercial/keyed	shelving & cabinets
5	Material Reproduction/ Mail Center	hollow metal	commercial/keyed	shelving, cabinets & countertops
6	Weapons/ Administration Storage	hollow metal	(Note 1)	N/A
7	Toilets/Showers/Lockers	hollow metal	N/A	N/A
Education				
1	Classrooms	solid core wood	commercial keyed	cabinets (lockable)
2	Instructor Preparation/ Counseling	solid core wood	commercial keyed	cabinets (lockable)
3	Multi-Purpose Training Area	hollow metal	commercial keyed	cabinets (lockable)
4	Auditorium	solid core wood	commercial keyed	N/A
5	Library	solid core wood	commercial keyed	shelving & cabinets
6	Learning Center	solid core wood	commercial keyed	shelving & cabinets
7	Distance Learning Center	solid core wood	commercial keyed	shelving & cabinets
8	Training Device/ Simulation Center	solid core wood	commercial keyed	shelving & cabinets
9	Training Aid Storage	solid core wood	commercial keyed	shelving & cabinets
10	Audio/Visual Storage	solid core wood	commercial keyed	shelving & cabinets
11	Test Control Storage	solid core wood	commercial keyed	shelving & cabinets
12	Break Area	N/A	N/A	shelving & cabinets
13	Physical Fitness Area	hollow metal	commercial keyed	N/A

Table 3. Doors, Hardware, Storage, and Shelving

	FUNCTIONAL AREA	DOORS	HARDWARE	STORAGE/ SHELVING
14	Toilets	hollow metal	N/A	N/A
Dining Facility				
1	Dining Area	hollow metal	commercial keyed	N/A
2	Kitchen	hollow metal	commercial keyed	shelving & cabinets
Billeting				
1	Serving/Sleeping Area	solid core wood	commercial keyed	--
2	Toilet/Shower	solid core wood	--	--

TABLE 3 – NOTES

General All doors to be 3 ft x 7 ft unless otherwise noted.

1. Government Series 86 dead bolt lock.

Table 4. Mechanical Requirements – Part 1

	FUNCTIONAL AREA	H/O	H/U	C/O	C/U	OA VENTILATION	NCB
Administration							
1	General Administration	68	55	78	85	10 cfm/person	< 35
2	Medical/Aid Station	68	55	78	85	20 cfm/person	< 35
3	Supply	55	55	78	85	1.0 AC/hr	-
4	Publication Storage	55	55	78	85	1.0 AC/hr	-
5	Material Reproduction/ Mail Center	68	55	78	85	20 cfm/person	< 40
6	Weapons/ Administration Storage	68	55	78	85	20 cfm/person	-
7	Toilets/Showers/Lockers	68	55	78	85	50 cfm/WC & UL or 1.0 cfm/ft ²	< 40
Education							
1	Classrooms	68	55	78	85	10 cfm/person	< 35
2	Instructor Preparation/ Counseling	68	55	78	85	10 cfm/person	< 35
3	Multi-Purpose Training Area	68	55	78	85	10 cfm/person	< 35
4	Auditorium	68	55	78	85	10 cfm/person	< 30
5	Library	68	55	78	85	10 cfm/person	< 30
6	Learning Center	68	55	78	85	10 cfm/person	< 35
7	Distance Learning Center	68	55	78	85	10 cfm/person	< 35
8	Training Device/ Simulation Center	68	55	78	85	10 cfm/person	< 35
9	Training Aid Storage	55	55	--	--	0.25 cfm/ ft ²	--
10	Audio/Visual Storage	55	55	--	--	0.25 cfm/ ft ²	--
11	Test Control Storage	55	55	--	--	0.25 cfm/ ft ²	--
12	Break Area	68	55	78	85	10 cfm/person	< 40
13	Physical Fitness Area	55	55	78	85	20 cfm/person	< 45
14	Toilets	68	55	78	85	50 cfm/WC & UL or 1.0 cfm/ft ²	< 40
Dining Facility							
1	Dining Area	68	55	78	85	15 cfm/person	< 45
2	Kitchen	68	55	78	85	1.0 cfm/ ft ² w/Hoods ACGIH Manual	Ref: <45
Billiting							
1	Sleeping Area	68	55	78	85	10 cfm/person	< 25
2	Toilet/Shower	68	68	78	85	1.0 cfm/ ft ²	< 40

TABLE 4 – ABBREVIATIONS

AC/hr	air changes per hour
cfm	cubic feet per minute
C/O	cooling/occupied, °F
C/U	cooling/unoccupied, °F
FD	floor drain
HB	hose bibb
H/O	heating/occupied, °F
H/U	heating/unoccupied, °F
NCB	balanced noise criterion
OA	outside air
fpm	feet per minute

TABLE 4 – GENERAL NOTES

1. Outside Air Ventilation rates are based on ANSI/ASHRAE Standard 62.1-2004 where the supply and return air distribution devices are ceiling mounted. If the distribution devices are located in the occupied zone reduce the air quantity by 50%. Regardless of where the air distribution devices are located the outside air quantity must be at least 15% of the total air circulated within the HVAC controlled space.
2. Exhaust Systems for special work processes that require an exhaust hood to capture particles being transported by the air stream must be designed in accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) Industrial Ventilation Manual and ASHRAE Handbooks of Fundamentals and HVAC Applications.
3. NCB curves specify maximum noise criteria due to the space itself and all sources of normal interior and exterior noise due to HVAC systems and other building equipment.

Table 5. Mechanical Requirements – Part 2

	FUNCTIONAL AREA	PIPED SERVICE	PLUMBING	OTHER
Administration				
1	General Administration	CW	EDF	
2	Medical/Aid Station	CW/HW	SK	
3	Supply			
4	Publication Storage			
5	Material Reproduction/ Mail Center			
6	Weapons/ Administration Storage			
7	Toilets/Showers/Lockers	CW/HW/FD		
Education				
1	Classrooms			
2	Instructor Preparation/ Counseling			
3	Multi-Purpose Training Area			
4	Auditorium	FD/CW	EDF	
5	Library			
6	Learning Center			
7	Distance Learning Center			
8	Training Device/ Simulation Center	CA/VAC/CW	EDF/HB	Note 1
9	Training Aid Storage			
10	Audio/Visual Storage			
11	Test Control Storage			
12	Break Area	CW/HW/FD	SK/EDF	
13	Physical Fitness Area	CW/FD	EDF	
14	Toilets	CW/HW/FD		
Dining Facility				
1	Dining Area	CW/FD	EDF	
2	Kitchen	CW/HW/FD		
Billeting				
1	Serving/Sleeping Area			
2	Toilet/Shower	CW/HW		

TABLE 5 – ABBREVIATIONS

CA	Compressed Air
CW	Cold Water
EDF	Electric Drinking Fountain
FD	Floor Drain
HB	Hose Bibb
HW	Hot Water
SK	Sink

TABLE 5 – NOTES

1. Training Device/Simulation Center: Utilities for this area may vary depending on equipment provided designer must have vender data prior to design activity.

Table 6. Electrical Requirements

	FUNCTIONAL AREA	LIGHTING	OUTLETS	NOTES
Administration				
1	General Administration	50 FC	2 duplex per 50 ft ²	4
2	Medical/Aid Station	70 FC	1 duplex per 10 LF of wall	1
3	Supply	30 FC	1 duplex per 20 LF of wall	
4	Publication Storage	30 FC	1 duplex per 20 LF of wall	
5	Material Reproduction/Mail Center	50 FC	1 duplex per 10 LF of wall	1
6	Weapons/Administration Storage	50 FC	1 duplex	
7	Toilets/Showers/Lockers	30 FC	1 duplex GFCI per 2 sinks	
Education				
1	Classrooms	70 FC	1 duplex per 10 LF of wall	
2	Instructor Preparation/Counseling	50 FC	1 duplex per wall	4
3	Multi-Purpose Training Area	50 FC	1 duplex per 10 LF of wall	1, 3
4	Auditorium	50 FC	1 duplex per 20 LF of wall	1, 3
5	Library	50 FC	1 duplex per 10 LF of wall	4
6	Learning Center	70 FC	1 duplex per 10 LF of wall	1
7	Distance Learning Center	50 FC	1 duplex per 10 LF of wall	1, 3
8	Training Device/Simulation Center	50 FC	1 duplex per 10 LF of wall	1, 3
9	Training Aid Storage	20 FC	1 duplex	
10	Audio/Visual Storage	30 FC	1 duplex	
11	Test Control Storage	20 FC	1 duplex	
12	Break Area	50 FC	1 duplex per 10 LF of wall	
13	Physical Fitness Area	50 FC	1 duplex per 12 LF of wall	2
14	Toilets	30 FC	1 duplex GFCI per 2 sinks	
Dining Facility				
1	Dining Area	30 FC	1 duplex per 10 LF of wall	
2	Kitchen	50 FC	Minimum of 1 duplex per 10 LF of wall	
Billeting				
1	Serving/Sleeping Area	30 FC	1 duplex per 10 LF of wall	4
2	Toilet/Shower	30 FC	1 duplex GFCI	

TABLE 6 – NOTES

All Electrical Power System/Service outlets in spaces must be designed and constructed in accordance with NFPA 70, National Electrical Code and the actual equipment layout. All Classified areas must be explosion proof construction including lighting and power supply.

Lighting Systems must be designed in accordance with IESNA Lighting Handbook. The Lighting Power Densities in Watts/ST input must be in accordance with ANSI/ASHRAE/IESNA Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential Buildings.

1. Provide telephone, data, and power to support mission of the activity.
2. Provide power for programmed equipment.
3. Provide multi-level switching or dimming.
4. Provide Desktop or task lighting.

Table 7. Special Equipment and Ceiling Heights

	FUNCTIONAL AREA	SPECIAL EQUIPMENT	CEILING HEIGHT*
Administration			
1	General Administration		9 ft
2	Medical/Aid Station		8 ft
3	Supply		10 ft
4	Publication Storage		8 ft
5	Material Reproduction/Mail Center		8 ft
6	Weapons/Administration Storage		8 ft
7	Toilets/Showers/Lockers		8 ft
Education			
1	Classrooms		10 ft
2	Instructor Preparation/ Counseling		8 ft
3	Multi-Purpose Training Area	Audio/Visual	10 ft
4	Auditorium	Audio/Visual	varies w/size
5	Library		10 ft
6	Learning Center		10 ft
7	Distance Learning Center		8 ft
8	Training Device/Simulation Center		14 ft
9	Training Aid Storage		8 ft
10	Audio/Visual Storage		8 ft
11	Test Control Storage		8 ft
12	Break Area		8 ft
13	Physical Fitness Area		10 ft
14	Toilets		8 ft
Dining Facility			
1	Dining Area		10 ft
2	Kitchen		10 ft
Billeting			
1	Serving/Sleeping Area		8 ft
2	Toilet/Shower		8 ft

APPENDIX D

FIGURES

- Figure 1. Battalion Set Site Arrangement
- Figure 2. Barracks Partial Plan
- Figure 3. BOQ/BEQ Partial Plan
- Figure 4. Regional Training Institute Site Plan

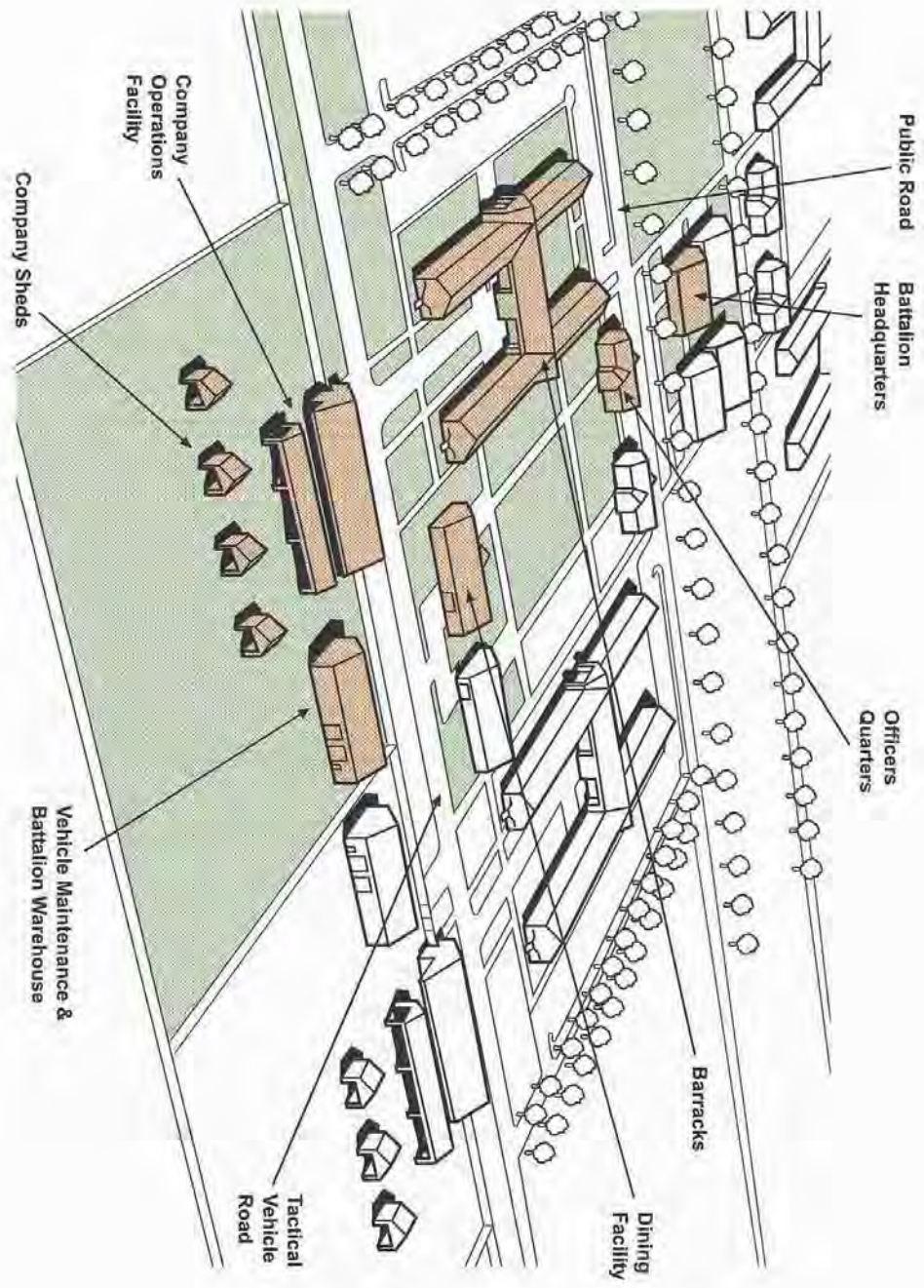


Figure 1. Battalion Set Site Arrangement

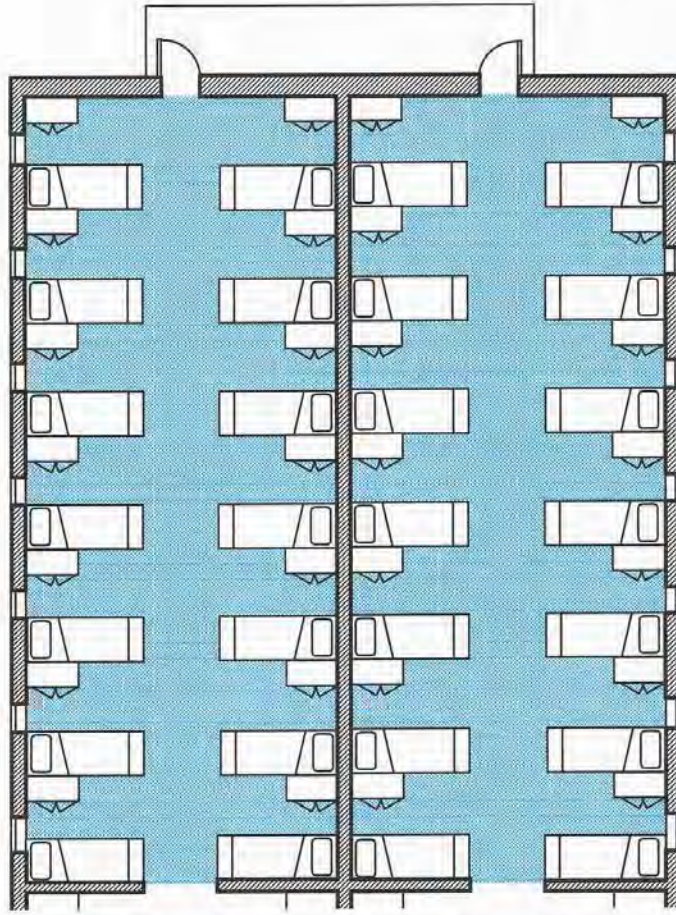


Figure 2. Barracks Partial Plan

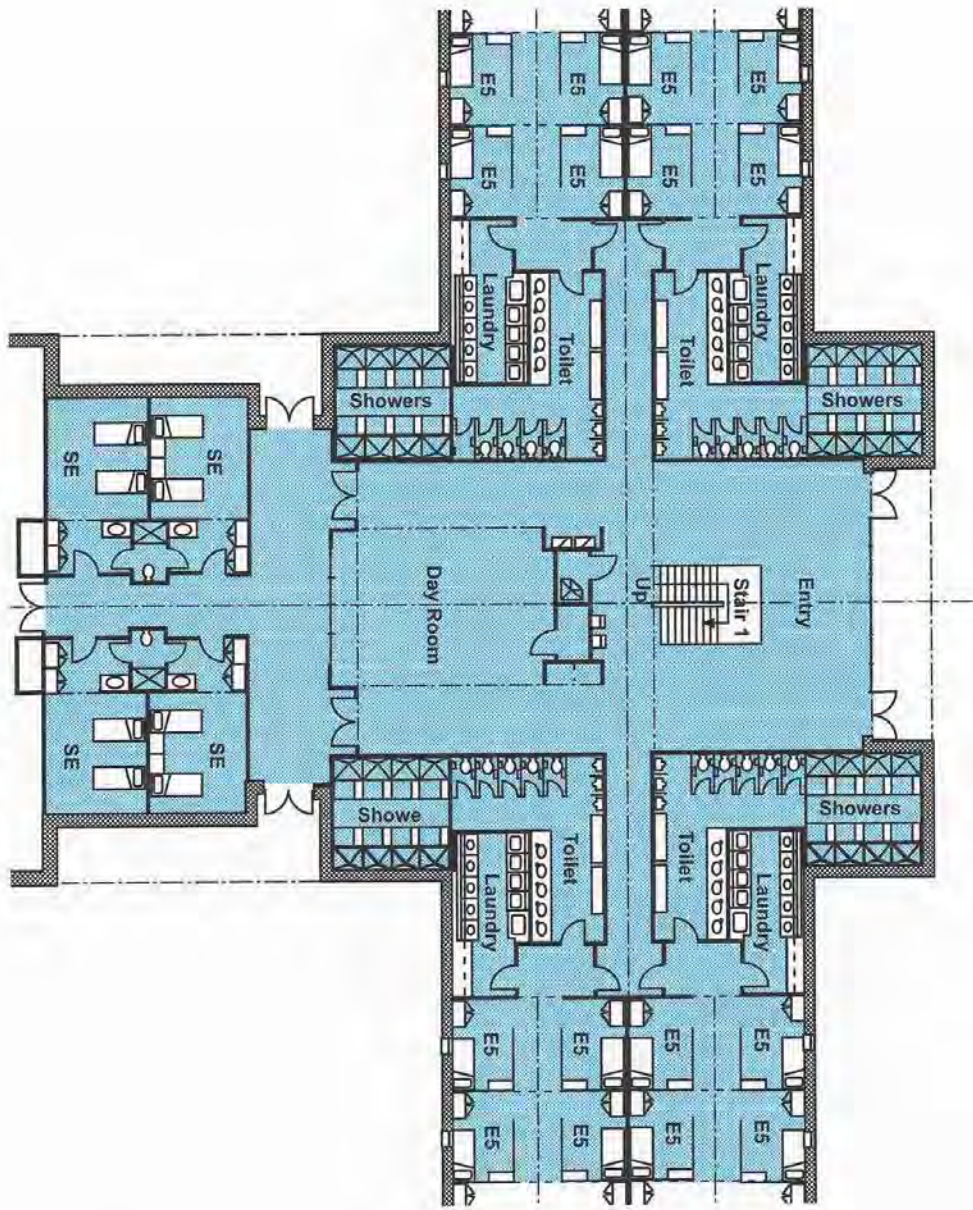
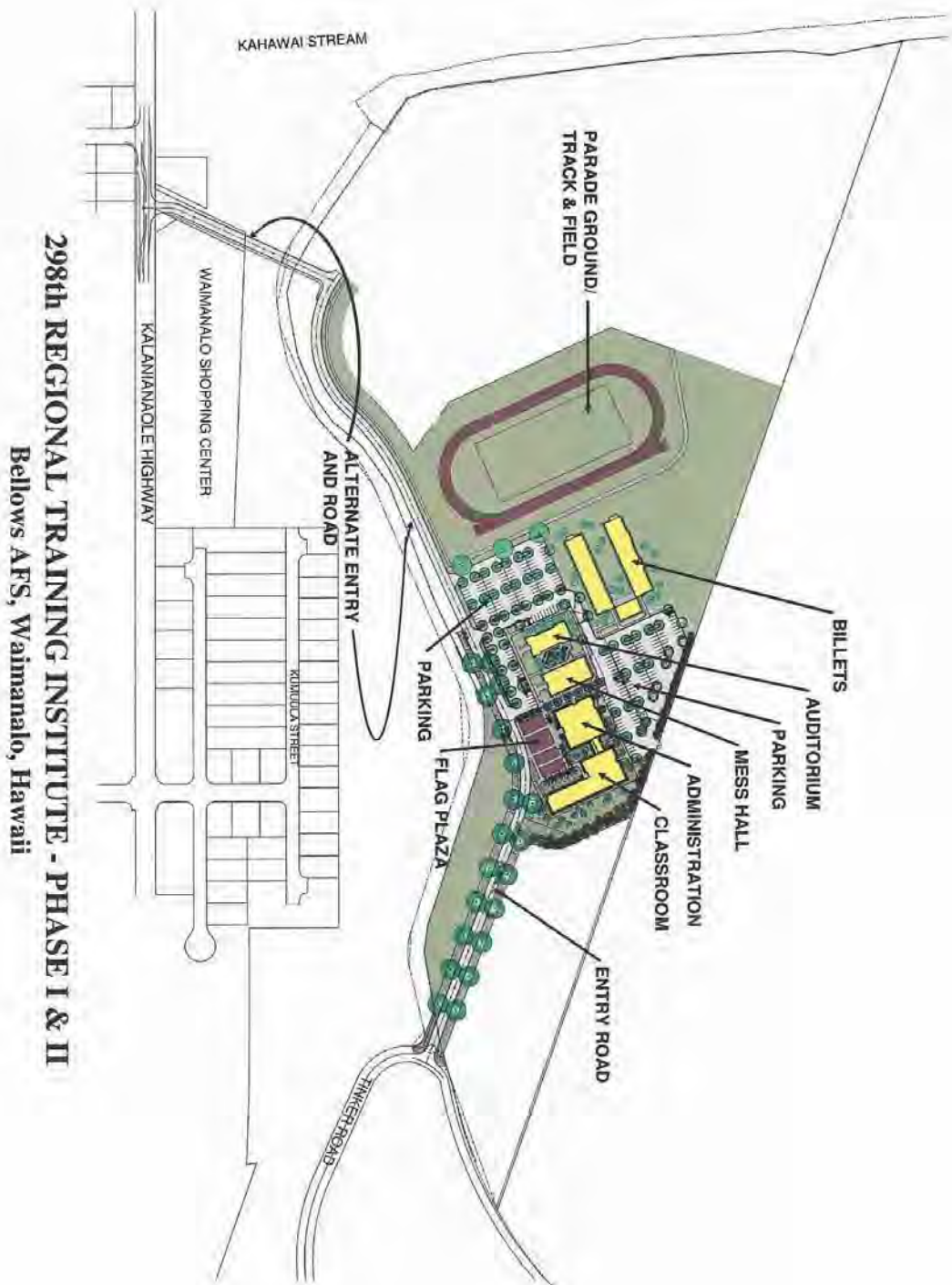


Figure 3. BOQ/BEQ Partial Plan



298th REGIONAL TRAINING INSTITUTE - PHASE I & II

Belows AFS, Waimanalo, Hawaii

ATTACHMENT D

ARNG DG 415-5 ARMY NATIONAL GUARD GENERAL DESIGN GUIDE



TETRA TECH

**ARMY NATIONAL GUARD
DG 415-5
GENERAL FACILITIES INFORMATION
DESIGN GUIDE**



**NATIONAL GUARD BUREAU
INSTALLATIONS DIVISION
111 SOUTH GEORGE MASON DRIVE
ARLINGTON, VA 22204-1382**

FOREWORD

This General Facilities Information Design Guide (DG 415-5) was published by the National Guard Bureau, Army Installations Division (ARNG-ILI). DG 415-5 applies to all projects for new construction (including additions) as well as alterations to and rehabilitation and conversion of existing facilities. It is intended to assist the States, Possessions, design agencies, and design architect-engineer in gaining an understanding of the general functions and environmental considerations to address in the design and construction documents for the Army National Guard (ARNG) facilities that qualify for support from Federal funds. This design guide does not contain criteria but refers readers to sources of criteria in other publications that relate directly to the specific technical design requirements.

DG 415-5 contains functional and technical information common to all ARNG facilities. It should be used in conjunction with the design guide developed for the specific facility type to assist in the design process.

Distribution is limited. However, authorized users of the NGB Guard Knowledge Online (GKO), can obtain an electronic copy at (gkoportal.ngb.army.mil/sites/ARI_HQ/default.aspx), Design, Guide Library site. All users are encouraged to submit comments and suggestions to improve this document by completing a DA Form 2028, "Recommended Changes to Publications and Blank Forms," and sending it directly to:

National Guard Bureau
Installations Division
ARNG Readiness Center
111 South George Mason Drive
Arlington, VA 22204-1382

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CHAPTER 1

GENERAL INFORMATION

1-1 **PURPOSE: PERFORMANCE DESIGN GUIDELINES**

This General Facilities Information Design Guide (DG 415-5), along with the facility-type design guides (DGs 415-1 Readiness Centers, 415-2 Logistics Facilities, 415-3 Aviation Facilities and 415-4 Training Site Facilities), sets forth functional and technical design and planning guidance to use in the development of military construction (MILCON) projects.

1-1.1 **Audience**

These design guides are written for the design architect-engineer (A-E) who will be preparing design and construction documents as well as for construction and facilities management officers (CFMOs) and other Army National Guard (ARNG) personnel who will be planning, reviewing, and approving the facility design. It is the intent of the National Guard Bureau, Army Installations Division (ARNG-ILI) to encourage the design A-E to design high-quality, user-friendly, functional, energy-efficient, and sustainable facilities using the latest engineering and construction industry standards.

To aid the reader, DG 415-5 includes the following:

- Appendix A, References, contains a detailed list of reference documents.
- Appendix B, Glossary, defines all abbreviations and acronyms used in this design guide as well as specialized terms that are used in this design guide.

1-1.2 **Master Plan Compliance**

Before project initiation, the CFMO should provide the design A-E with an approved working or preliminary master plan for the proposed facility site. The State Military Department should provide special instructions for any deviations from the master plan. The design A-E should consider sustainable material types and construction industry standards indicated in these design guidelines to establish the minimum project quality.

1-2 **ROLE OF THE FEDERAL GOVERNMENT**

Title 10 of the United States Code (U.S.C.) authorizes contributions of Federal funds to the States and possessions to provide facilities for the training and administration of Reserve components of the Armed Forces. NG PAM 415-12 establishes facilities allowances, and these design guides provide the design and construction performance recommendations governing such contributions from Federal funds that the NGB Chief administers. Each such contribution is subject to the terms of a Military Construction

Cooperative Agreement executed specifically for providing designated facilities. These agreements are executed under authority granted in Title 10, United States Code, Chapter 1803, which states that all work “shall be done according to the laws of that jurisdiction and under the supervision of its officials, subject to inspection and approval of the Secretary of Defense.” The United States Property and Fiscal Officers (USPFO) are responsible for disbursement of Federal funds contributed toward the construction of State ARNG facilities projects.

1-3 NATIONAL GUARD BUREAU POLICY

ARNG-ILI has specific policy regarding the types of buildings and installed equipment eligible for Federal support in ARNG facilities, as outlined in the following paragraphs.

1-3.1 Technical Instructions Criteria

Where specified guidelines are not set forth herein or in the program documents, design criteria in NGR 415-10, NG PAM 415-12, Unified Facilities Guide Specifications and MIL-STD 3007F apply for all MILCON projects.

1-3.2 Construction and Equipment Materials Criteria

The materials and equipment allowances are to be considered the maximum allowable using Federal contributions toward construction costs. Use of the full maximum allowances is permissible rather than mandatory because local conditions may justify the actual facility constructed.

A project's DD Form 1390/91 documents the approved scope and Federal share for each component of the project, and the CFMO may not design or construct beyond this level without receiving ARNG-ILI approval or an amended funding document.

1-3.3 Federal Support

In order for an ARNG facilities project to qualify for Federal support, the materials and equipment incorporated, built-in, or installed shall be submitted and approved by ARNG-ILI at or prior to Final Design (95%).

1-3.4 Non-Federal Funds

These design guides do not preclude the use of non-Federal funds to provide materials, equipment, or features of higher quality than suggested, provided that the Federal share of the operating and maintenance cost does not increase. The cost of such improvements, however, must be clearly determinable as separate bid items or specified as a contractor's option. If the amount of higher-quality features, equipment, materials, and space not Federally supportable is unusually large and makes separate bidding impractical, the State and the Federal Government must negotiate an agreement to establish the limitations of the Federal share of the overall project construction costs. This is usually expressed as a percentage of the total construction cost.

1-3.5 Equipment Not in Contract

Portable furniture and equipment may not be supported by Federal construction funds. Examples are desks, chairs, tables, stools, map cases, unattached shelving, fire extinguishers, coats of arms, State seals, memorial plaques, entrance door mats, and waste receptacles.

1-3.6 Performance Focus

ARNG-ILI encourages the use of contractor's options and performance-type specifications as a means of ensuring procurement of the most economical system or component. The materials and methods of construction proposed for use on a given facility must have been used on a sufficient number of State facilities to establish a documented record of performance.

For functional area flexibility, the design A-E may increase or decrease individual functional areas by exchanging a percentage of the area between functions as per NG PAM 415-12, Chapter 1-7. However the total net functional area may not exceed that authorized for the facility unless it is funded with other than Federal funds.

1-3.7 Accessibility

All ARNG facilities shall be designed and constructed in accordance with Public Law 90-480, the Architectural Barriers Act (ABA) of 1968, as amended. The document that sets standards as a result of this law is the Uniform Federal Accessibility Standards (UFAS). These standards primarily address projects in the Federal sector or projects built and leased with Federal funds. Currently, UFAS applies to all ARNG projects.

After the Americans with Disabilities Act (ADA) of 1990 were enacted, the U.S. Access Board under the Department of Justice has regularly updated the ADA Accessibility Guidelines (ADAAG). These guidelines address projects in the private sector (places of commercial accommodation and commercial facilities) and the public sector (State and local government facilities). Currently, ADAAG applies to all ARNG projects.

New guidelines, which combine UFAS and ADAAG into one unified standard, were published in the *Federal Register* in July 2004 and became effective on September 21, 2004. This unified standard, the Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines, was created under 36 CFR, Parts 1190 and 1191. This rule contains a separate scoping document for ADA facilities, a scoping document for ABA facilities, and a joint technical section referenced by each scoping section. Refer to the summary of the new guidelines in the July 23, 2004, *Federal Register*, which contains a detailed description and background information. The latest version of this standard is 2010 ADA Standard for Accessible Design (by the Department of Justice). ARNG intends to apply this standard in lieu of the separate ADAAG and UFAS.

As noted in the preamble to the UFAS, the basis for the first accessibility standards adopted by the Federal government and most State governments was ANSI 117.1, Accessible and Usable Buildings and Facilities. This code has been recognized by the

private sector and the Council of American Building Officials, and is the accessibility code referenced in the International Building Code (IBC). Because ARNG projects follow a statewide building code in many instances, this code may apply when referenced by the adopted model statewide building code. The design A-E is directed to compare the accessibility codes and use the more stringent one. The new, unified Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines may reduce the potential for conflicts with other regulations developed by State agencies.

1-3.8 Hazardous Materials Abatement

The design A-E will need to comply with all U.S. Environmental Protection Agency (EPA) reference documents. The design A-E shall also consult with the CFMO to determine any special State and local requirements.

1-3.8.1 Asbestos Removal

Before facility buildings are programmed or planned for alteration, rehabilitation, and addition, a survey should be undertaken to establish the amount, location, and estimated cost of asbestos removal. A letter should be sent from the CFMO to ARNG-ILI to indicate that there is an asbestos problem and that authorization to do an asbestos survey and design for removal is urgently needed because asbestos has to be removed prior to any construction.

The cost of asbestos removal should be included as an item in the program and funding documents. The cost of the survey and asbestos removal is 100 percent supportable by Federal funds for all functional areas authorized in the Federal project requirements.

If only a portion of an existing building requires alteration or rehabilitation, all the asbestos in the building must be removed before beginning the alteration or rehabilitation phase of the project. If emergency repairs (such as re-insulating a boiler) are needed after asbestos removal, the asbestos removal portion of the project should include the repair cost.

1-3.9 Value Engineering Studies and Life Cycle Cost Analysis

The State is encouraged to acquire the services of a Certified Value Specialist (CVS) to lead the value engineering study (VES) to ensure that design solutions are cost effective. The VES also serves as a means of identifying opportunities for substitutions during the design process, should the project exceed budget requirements, while still maintaining the level of quality performance expected.

The VES should be accomplished early in project development once the design concept and the building systems have been initially defined. Each item in the VES should be clearly defined by narrative and drawing, and the cost savings should be shown with related calculations. The specific, formally documented VES recommendations should be incorporated in the Preliminary (35-50%) Design milestone design review submission to NGB-ARI. Before proceeding with project development beyond the Preliminary milestone, all VES decisions should be made regarding which recommendations to implement immediately and which to consider contingent items to

incorporate if costs continue to exceed budget. The VES should be a 3-day limited workshop since the site has been selected by the State prior to the design phase. The VES Workshop should adhere to the 5-step methodology and approach prescribed by the Society of American Value Engineers (SAVE) International.

An integral part of the VES process is life cycle cost analysis (LCCA), which is a systematic means of evaluating the entire building initial, energy, operation and maintenance cost over an extended period of time. A formal LCCA should be used to compare system alternatives. This process requires caution because the recommended system may increase the facility initial cost above the approved programmed funding amount.

1-3.10 Signage and Graphic Standards

All signage and graphics at a facility should comply with requirements of the State Military Department; General Services design standards or industry standards. If the proposed facility is located on a U. S. Armed Forces military installation, local signage standards should be followed.

1-3.11 Project Scheduling Requirements

(ARNG ILI will provide form)

1-3.12 Warranty Requirements

ARNG-ILI requires that products and systems have warranty provisions according to industry standards. The following list identifies the majority of these elements under the Unified Facilities Guide Specification (UFGS)/CSI 2004 MasterFormat that may occur in ARNG facilities.

DIVISION 02 – EXTERIOR IMPROVEMENT

- Water Distribution System
- Packaged Sewage Pumping Station
- Irrigation Systems
- Seeding, Sodding, Plants, and Planting

DIVISION 03 – CONCRETE

- Concrete Surface Sealer
- Glass Fiber-Reinforced Concrete

DIVISION 04 – MASONRY

- Brick Masonry

DIVISION 05 – METALS

- Shop Applied Metal Finishes

DIVISION 06 – WOOD, PLASTICS AND COMPOSITES

- Laminated Wood Construction
- Polymer Surfacing Materials

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

- Waterproofing
- Water Repellent Coatings
- Cementitious Damp proofing
- Exterior Insulation Finish System
- Fireproofing
- Roofing
- Metal Siding and Wall Panels
- Fluid Applied Deck Coatings
- Flashing and Sheet Metal
- Roof Hatches
- Joint Sealants

DIVISION 08 – OPENINGS

- Steel Doors and Frames
- Wood Doors
- Glass Door Assemblies
- Aluminum Storefront and Windows
- Wood Windows
- Skylight Systems
- Finish Door Hardware
- Glass and Glazing
- Curtain Wall Systems

DIVISION 09 – FINISHES

- Exterior Studwall System
- Ceramic and Quarry Tile
- Terrazzo
- Acoustical and Other Specialty Plaster Finishes
- Wood Flooring
- Resilient Flooring
- Carpet and Carpet Tile
- Fluid-Applied Seamless Flooring
- Wall Coverings

DIVISION 10 – SPECIALTIES

- Markerboards and Tackboards
- Toilet Partitions
- Access Flooring Systems
- Demountable Partitions
- Toilet and Bath Accessories

DIVISION 11 – EQUIPMENT

- Window Washing System Equipment

Dock Levelers and Lifts
Food Service Equipment
Detention Equipment
Shooting Range Equipment

DIVISION 12 – FURNISHINGS

Architectural Casework
Window Shades
Entrance Mats

DIVISION 13 – SPECIAL CONSTRUCTION

Prefabricated Wall and Partition Systems
Prefabricated Radio Frequency Shielding Enclosure
Pre-Engineered Buildings

DIVISION 14 – CONVEYING SYSTEMS

Elevators

DIVISION 21 – FIRE SUPPRESSION SYSTEMS

DIVISION 22 – PLUMBING

Plumbing Fixtures and Pumps
Gas and Vacuum Systems
Fuel Oil Systems

DIVISION 23 – HEATING, VENTILATING & AIR CONDITIONING

Chillers
Cooling Towers
Steam Generators
Unit Heaters
Packaged Air-Handling Units
Exhaust Fans
Fiberglass Reinforced Plastic Ductwork

DIVISION 25 – INTEGRATED AUTOMATION

Energy Management and Control System
Utility Monitoring and Control System

DIVISION 26 – ELECTRICAL

Wiring Devices
Lighting Fixtures
Uninterruptible Power Supply Systems
Standby Power Generator Systems
Battery Powered Systems

DIVISION 27 – COMMUNICATIONS
Administrative Telephone Equipment

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY
Electronic Security System
Closed Circuit Television Systems
Fire Alarm and Detection System
Mass Notification System

1-3.13 Performance Specifications

The Unified Facilities Guide Specifications (UFGS) with technical notes is available to the A-E design team via the Whole Building Design Guide website at (www.wbdg.org/ccb/browse_org). However, the A-E is encouraged to suggest areas where a creative solution could be better managed through a performance-based specification for that particular element. Given the dual role of many ARNG facilities, the need for flexibility could become a driver for a creative solution using this method. Such a method could be considered in the following situations:

- Where the desired systems have not evolved to standardized configurations or solutions from manufacturer to manufacturer, or where no alternatives are similar enough that a prescriptive method could be used without inadvertently excluding all other variations of the system desired. Examples are a new integrated system for automated vehicle wash racks, a specialized type of paint removal system, or even a large-scale paint spray system or other industrial-based process.
- Where it is desirable, because of complexity or for other reasons, to delegate the responsibility for designing and integrating a particular system to an industry specialist. An example of this is crane systems.

Careful coordination is required to define the performance-based requirements, criteria, and tests for a particular attribute or system.

The design standards for finishes in ARNG facilities favor a more flexible set of recommendations and parameters for finish performance. The design A-E should continue this flexible approach in the design process, working from a palette of finishes that meet these requirements and criteria. This flexible approach may be extended to the specifications process for finishes, where the requirements and criteria can be well defined.

1-3.14 Operation and Maintenance Design Priorities

Important aspects of the design of all Army National Guard facilities are the selection of maintainable finishes and the provision of access or placement of building equipment and other fixed elements. The following are ways to address concerns in the design process:

- Select finishes based on the durability requirements related to the use of the space.
- Specify slip-resistant floor materials and finishes where water can be tracked in.
- Position heating, ventilation, and air conditioning (HVAC) and other mechanical and electrical components that are located above the ceiling and require servicing within easy reach from below to avoid the need for a service lift and major ceiling disassembly.
- Allocate adequate clearances for the servicing and replacement of large pieces of building mechanical and electrical equipment.
- Provide for ready access to wells and containment systems for inspection.
- Consider the use of a low-power traction elevator system that is competitive in cost with hydraulic units, and consider a machine room that can fit inside the hoistway.
- The designer should specify Total Building Commissioning when programmed in the DD Form 1390/91 funding document at 1% primary building cost.

1-3.15 Applicable Codes and Standards

The references list in Appendix A pertains to national standards, the International Building Code (IBC) will be considered as the minimum acceptable standard for ARNG Design Guides. The CFMO should provide in writing for the design A-E all categories of State regulations that exceed national standards.

1-3.16 Fire Protection

Fire protection guidelines follow:

- Incorporate efficient and cost-effective fire protection and detection systems in all ARNG facility designs.
- Comply with the requirements for all building space types presented in the International Building Code and National Fire Protection Association (NFPA) standards and with criteria presented in UFC 3-600-01 Fire Protection Engineering for Facilities. Also address State and local requirements that are more stringent than these sources.
- Ensure that the municipal water supply pressure and capacity or independent means (including storage tanks) comply with the water source requirements of the fire suppression systems.

- Provide adequate water source, sprinkler, emergency generator, and alarms systems capacity to accommodate limited building expansion on site.
- Include the means of egress, with all related calculations. Maintain the proper dimensions of all means of egress during detailed design.
- Identify all rated separations, and ensure that all building systems components at these separations support the rating.
- Coordinate smoke evacuation systems with the HVAC design.
- Adequately isolate and vent areas with highly combustible products, including the petroleum, oils, and lubricants (POL) storage.
- Ensure that the antiterrorism/force protection (AT/FP) standoff barrier components include access for fire-fighting apparatus.
- Telecommunication/Information Technology spaces must comply with the above codes for a primary system, a secondary Halon alternative clean agent fire extinguishing system maybe used.

1-3.17 Occupational Health and Safety

1-3.17.1 General Information

The U.S. Department of Labor, Occupational Safety & Health Administration (OSHA) Standards for General Industry in 29 CFR Part 1910 and DA PAM 40-503, Industrial Hygiene Program, requires that ARNG provide a safe and healthy workplace for its employees. All Readiness Centers with Indoor Firing Ranges, Logistics and Aviation Maintenance facilities must have an Industrial Hygiene / Chief Surgeon's Office (ARNG-CSG-P) technical review prior to construction. Personal protective equipment (PPE) and administrative procedures are only interim measures for controlling occupational hazards. The following paragraphs address other measures.

1-3.17.2 Noise and Vibration Reduction

Noise-induced hearing loss is one of the most common occupational hazards. Currently, ARNG uses PPE as the main means of preventing hearing loss; however, engineering controls would be more effective. Mechanical equipment rooms contribute most of the high noise and vibration levels in buildings. The design A-E should take great care when locating these spaces to avoid adjacencies with incompatible noise tolerances. Mechanical equipment mounted rigidly to the supporting structure produces excessive vibration levels. The design A-E shall select vibration isolation methods to eliminate these problems. For equipment applications the designer should reference ASHRAE Handbook of Fundamentals.

1-3.17.3 Indoor Air Quality

The design of the building HVAC and exhaust systems must include indoor air quality features to ensure a safe environment. The design A-E should follow American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 62.1-2007, which recommends the minimum outdoor air rates for buildings, and the American Conference of Governmental Industrial Hygienists (ACGIH) Industrial Ventilation Manual for recommended practices related to specific exhaust and ventilation systems design.

A combination ventilation and exhaust system needs to be designed for the specific occupancy and process within each area to meet the indoor air quality standards. The design A-E should establish temperature, humidity, and ventilation criteria for each space and should design special exhaust hoods where necessary. Although specific humidity criteria may not be published for many areas, all conditioned spaces should be designed to maintain not higher than 50 percent relative humidity (RH).

Consideration must be given to air quality in storage rooms and similar spaces. Although these areas are not normally occupied, they may require ventilation, temperature, and/or humidity control to prevent damage to stored material and provide an acceptable environment for personnel using the room.

Air-handling unit (AHU) design should minimize mold and mildew growth inside the units. AHUs should have a filter bank (pre-filters @ 30% and final filter @ 85% efficient) base on *ASHRAE Standard 52.1-1992 Atmospheric Dust-Spot Efficiency* rating to prevent dust collection on coils, and drain pans should be properly sloped and provided with condensate traps to eliminate standing water in the units. AHUs should not be operated during construction without proper filters in place, and all filters should be replaced at turnover to the ARNG.

1-3.17.4 Location of Air Exhaust and Intake

Exhaust air discharges and vents must be located at a proper distance from intakes to prevent cross-contamination and must be in a location which does not expose people or other buildings to hazardous discharge. Outside air intakes must also be located to minimize induction of vehicle exhaust and other site contaminants; in addition, they must be located and protected as prescribed by antiterrorism requirements. The design A-E should follow the recommended guidelines of ACGIH and local building codes.

1-3.18 Energy Efficiency

It is important to emphasize building envelope, mechanical and electrical systems efficiency as referenced in *UFC 3-400-01, Design: Energy Conservation*. An LCCA is to be performed to evaluate at least two proposed mechanical systems. The Energy Policy Act of 2005 (EPA-05) amended in 2007 published guidelines to design/construct buildings 30% more efficient than ANSI/ASHRAE/IESNA Standard 90.1-2007, if life cycle cost effective. The building envelope, mechanical and electrical systems must be designed in accordance with ANSI/ASHRAE/IESNA 90.1-2007 or the State energy

codes. The use of air-side or water-side heat recovery systems should be considered where they can be applied effectively.

ARNG buildings are frequently occupied on irregular schedules, with many areas used only on weekends and/or at night. Therefore, the mechanical systems should be zoned so that heating, cooling, and ventilation can be reduced in portions of the building when they are unoccupied.

1-3.19 HVAC System Quality

When selecting mechanical equipment and designing systems, the A-E should strive for a system that will provide low maintenance and long life while providing a quality indoor environment. The use of rooftop packaged AHUs should be minimized because of their relatively short life and the inconvenience of servicing them. Double-wall AHUs are generally more robust and more easily maintained. Stainless steel condensate drip pans and cooling coil casings extend the life of an AHU and provide a cleaner surface, which reduces growth of mold and mildew. The designer should use ASHRAE Handbooks of Fundamentals, HVAC Applications and HVAC Systems and Equipment as guidance.

On larger installations, hydronic cooling utilizing a central chiller plant should be investigated in lieu of packaged direct expansion (DX) cooling, which typically is more maintenance intensive. The design A-E should avoid using steam for heat distribution as the boiler and piping system are more difficult to maintain than hot water. Direct-fired warm air furnaces and unit heaters typically require more maintenance and have a shorter life than hydronic systems; they should be used only in small installations where a central system is not practical.

1-3.20 Geotechnical Investigation

Site selection and Federal support shall conform to NGR 415-5, Chapter 4. Based on a visual observation of the site and knowledge of the local area, an appropriate number of soil borings should be made to determine the nature and consistency of subsurface soil conditions. Additional borings are warranted if the results are inconclusive or insufficient for the foundation and pavement design. The Site Survey Report, to be prepared in accordance with NGR 415-5, must include the results of the investigation of the selected site. The CFMO and NGB-ARI use the completed Soil Bearing Capacity Declaration (NG PAM 415-5, Appendix G) to gauge the adequacy of the site and thus determine whether to grant Federal funds for construction of the facility at that particular location. This declaration should include the actual allowable design soil bearing capacity.

1-3.21 Bid Format Information

Two types of formats may be used for bidding:

- All Bid Formats are located in NG PAM 415-5, Appendix L.

Separate bids must also be obtained for the Intrusion Detection Systems and Interior Intrusion Detection System equipment-in-place, maintenance repair, and other support items to identify the funding support when provided from different accounts or to identify varying proportions of Federal/State cost sharing. Although the bids may be lump sum for each item, the quantity and unit of measure for each should be included, where practical, showing the magnitude of work required.

The bids of all authorized items (including site preparation and the IDS) are to be totaled before listing additive and/or alternative items that are to be supported with other than Federal funds. A written description of each bid is also to be provided to define the scope of work associated with the bid amount.

In addition, unit price bids should be obtained for the various types of work that may have to be increased or decreased during the period of construction, or when the unit cost of work must be utilized to determine the cost of work in excess of authorized amounts (such as excess foundation walls, exterior walls, and interior partitions).

1-3.22 Commissioning Buildings and Systems

Total building (enhanced) commissioning is recommended for all ARNG MILCON projects for new construction and major renovation. Fundamental Commissioning of Building Energy Systems is a prerequisite for LEED-NC and Enhanced Commissioning is a one (1) point credit.

The total cost allowed for this activity will be 1% of the Primary Facility Cost. A line item cost of 0.6% for the construction phase will be indicated on the DD Form 1390/91 Funding Document. The design phase allowance of 0.4% will be funded with P&D funds. This cost allowance includes the services of an Independent Commissioning Agent. The CFMO should provide the design Architect-Engineer and the Commissioning Agent a copy of the ARNG COMMISSIONING RFP/SOW prior to design startup.

Commissioning Defined:

- The National Conference on Building Commissioning has established an official definition of Total Building Commissioning as “The systematic process of assuring by verification and documentation, from the design phase to a minimum of one after construction, that all facility systems perform interactively in accordance with the design documentation and intent and in accordance with the owner’s operational needs, including preparation of operation personnel”.

Commissioning with respect to the U. S. Green Building Council Leadership in Energy and Environmental Design for New Construction and Major Renovations (LEED-NC), Energy & Atmosphere;

- EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems are required for all ARNG MILCON projects. The intent is to verify that

the building's energy related systems (Mechanical/HVAC/Electrical) are installed, calibrated and perform according to the owner's project requirements, basis of design and construction documents.

- EA Credit 3: Enhanced Commissioning, this commissioning process begins early during the design process and execute additional activities after systems performance verification is completed.

CHAPTER 2

ANTITERRORISM/FORCE PROTECTION

2-1 GENERAL INFORMATION

Any building or portions of buildings routinely occupied by 11 or more DoD personnel with a population density greater than one person per 430 ft² requires the minimum antiterrorism/force protection measures. Compliance with the U.S. Department of Defense (DoD) Minimum Antiterrorist Standards for Buildings (UFC 4-010-01) is not an option. However, the individual State's AT/FP officer's recommendations to the adjutant general determine the level of protection required (the degree to which assets are protected against injury or damage from an attack) at the specific site.

These standards may be supplemented where specific terrorist threats are identified, where more stringent local standards apply, or where local commanders dictate additional measures. The individual State Antiterrorism/Force Protection Officer recommendations to the Adjutant General assist in determining the level of protection required (the degree to which assets are protected against injury or damage from an attack) at the specific site. At a minimum, the level of protection identified in UFC 4-010-01 for Inhabited Buildings, Primary Gathering Facilities, Billeting, and High Occupancy Family Housing will be incorporated into the design.

During the design process, the design A-E shall conduct all protection analysis as described in DA PAM 190-51, DOD Security Engineering Publications UFC 4-020-01FA, UFC 4-020-02FA, UF 4-020-03FA and UF 4-020-04FA. For some protective strategies, the design process may include identification of multiple scenarios or alternatives for achieving the required level of protection. All alternatives should undergo a suitability analysis, which takes into account factors that may limit the feasibility of the concepts. Potential future expansion of the new facilities should be considered in the analysis. Factors limiting effective AT/FP strategies may consist of physical, resource, and political constraints such as land area restrictions.

2-2 DESIGN PHILOSOPHY

The security engineering requirements identified in UFC 4-010-01 Minimum Antiterrorism Standards for Buildings, UFC 4-010-02 Minimum Standoff Distances for Buildings (FOUO), and UFC 4-023-03 Progressive Collapse provide the framework for incorporating major design strategies (Civil, Structural, Architectural, Mechanical, and Electrical) that are the most effective and economical in protecting DoD personnel from terrorist attacks.

Baseline Threat: The location, size, and nature of terrorist threats are unpredictable. The standards identified in UFC 4-010-01 are based on a specific range of assumed threats that provide a reasonable baseline for the design of all inhabited DoD buildings. Designing to resist baseline threats will provide general protection today and will establish a foundation upon which to build additional measures where justified by higher threats or where the threat environment increases in the future. While those baseline threats are less than some of the terrorist attacks that have been directed against U.S. personnel in the past, they represent more severe threats than a significant majority of historical attacks. It would be cost prohibitive to provide protection against the worst-case scenario in every building. The terrorist threats addressed in the UFC 4-010-01 standards are further assumed to be directed against DoD personnel. Threats to other assets and critical infrastructure are beyond the scope of the DoD required Minimum Antiterrorism Standards, but they are addressed in UFC 4-020-01

Level of Protection: The standards in UFC 4-010-01 afford a Low level of protection for billeting, high occupancy family housing, and primary gathering buildings and a Very Low level of protection for other inhabited buildings. Greater protection is provided for primary gathering buildings, billeting, and high occupancy family housing because of the higher concentration of personnel and the more attractive nature of the target.

2-2.1 **Standoff Zone:** The primary design strategy is to keep aggressors as far away from inhabited DoD buildings as possible. The easiest and least costly opportunity for achieving the appropriate levels of protection against terrorist threats is to incorporate sufficient standoff distance into project designs. While sufficient real estate is not always available to provide the standoff distances required for conventional construction, maximizing the available standoff distance always results in the most cost-effective solution. Maximizing standoff distance also ensures that there is opportunity in the future to upgrade buildings to meet increased threats or to accommodate higher levels of protection.

2-2.2 **Building Structural Design.** Provisions relating to preventing building collapse and building component failure are essential to effectively protecting building occupants. Those provisions apply regardless of standoff distance or the ability of a building to resist blast effects. Designing those provisions into buildings during new construction or retrofitting during major renovations, repairs, restorations, or modifications of existing buildings is the most cost effective time to do that. In addition, structural systems that provide greater continuity and redundancy among structural components will help limit collapse in the event of severe structural damage from unpredictable terrorist acts.

2-2.3 **Hazardous Flying Debris.** In past explosive events where there was no building collapse, a high number of injuries resulted from flying glass fragments and debris from walls, ceilings, and fixtures (non-structural features). Flying debris can be minimized through building design and avoidance of certain building materials and construction techniques. The glass used in most windows breaks at very low blast pressures,

resulting in hazardous, dagger-like shards. Minimizing those hazards through reduction in window numbers and sizes and through enhanced window construction has a major effect on limiting mass casualties. Window and door designs must treat glazing, frames, connections, and the structural components to which they are attached as an integrated system. Hazardous fragments may also include secondary debris such as those from barriers and site furnishings.

2-2.4 Building Layout. Effective design of building layout and orientation can significantly reduce opportunities for terrorists to target building occupants or injure large numbers of people..

2-2.5 Airborne Contamination. Effective design of heating, ventilation, and air conditioning (HVAC) systems can significantly reduce the potential for chemical, biological, and radiological agents being distributed throughout buildings.

2-2.6 Mass Notification. Providing a timely means to notify building occupants of threats and what should be done in response to those threats reduces the risk of mass casualties. Refer to UFC 4-021-01 Mass Notification Systems.

2-2.7 Future Upgrades. Many of the provisions of these standards facilitate opportunities to upgrade building protective measures in the future if the threat environment changes.

2-3 DESIGN ELEMENTS

2-3.1 Standoff Distances. The primary impact on project scope for sitework will be the establishment and maintenance of standoff distance. That standoff will have to be provided to any location that is accessible to vehicles. For the stationary vehicle bomb tactic those locations may be limited to those that have legitimate vehicle access such as parking areas and roadways. The key to understanding the planning implications of the standoff distance is in knowing the type of vehicle and the explosive weight associated with the threat and determining where access of those vehicles will be controlled. The approach, therefore, is to establish a standoff distance based on the largest applicable explosive weight based on the applicable threat severity level and require access procedures for entry past that perimeter to be applied to all vehicles at that standoff distance.

The conventional construction standoff distances identified in UFC 4-010-01 Tables B-1 and D-1 were developed by the U.S. Army Corps of Engineers to provide survivable structures for a wide range of conventionally constructed buildings and expeditionary/temporary structures. These buildings range from tents and wood framed buildings to reinforced concrete buildings. The pressures resulting from explosive blasts can be very high, but they decrease rapidly with distance. That suggests that where land is available the least expensive way to provide protection against explosives is to maximize the standoff distance. The general design strategy, therefore, is to provide as

much standoff distance between protected facilities and potential locations for vehicles, such as parking areas, roadways, and other locations that could be accessible by vehicles.

2-3.2 Facility Arrangement

When possible, facilities that are functionally compatible and have similar threat levels should be clustered. This reduces the required perimeter area to be protected, limits access points to serve multiple facilities, and promotes compact security areas. However, the practical benefits of clustering facilities must be balanced against the survivability benefits of resource dispersal in the event of an attack. The arrangement of buildings into complexes that have strongly delineated boundaries and are oriented to enhance the surveillance opportunities creates a “defensible space” that can be protected more efficiently than scattered buildings.

2-3.3 Vehicular Access and Circulation

Limiting the opportunities for aggressors to get close to buildings with vehicles is the first line of defense. Ways to achieve the minimum standoff distance from vehicle circulation or parking include creating a buffer zone using design features such as landscape elements and bollards. However, the design must address site access and circulation for fire department apparatus and other emergency vehicles. The site circulation should be designed to prevent high-speed approaches by vehicles. The vehicle entrances should be offset from the major areas of high-risk concentration, and higher-risk resources should be in a location that is remote from primary roads.

2-3.4 Site Perimeter Vehicle Inspection

At facilities requiring vehicle inspection or controlled access, the design considerations are as follows:

- Provide space for inspection and waiting in line at the site access point, with adequate protection from inclement weather.
- Incorporate design features that are appropriate with regard to the threat assessment (see paragraph 4-1.2) and prevent vehicles from breaching the perimeter before being inspected.
- Whenever possible, accommodate commercial, service, and delivery vehicles by providing a separate, designated entry that preferably is distant from higher-risk resources.

Locate driveup or drop-off areas away from large glazed areas of the building to minimize the effects of an explosive blast

2-3.5 Site Lighting

Effective, uniform site lighting levels should be provided at a minimum of 0.50 foot-candle (FC) across the site and supplemented with additional focused lighting at vehicle and pedestrian entrances. Site lighting should be evaluated and designed in accordance with IES-NA. The lighting design should be coordinated with the closed-circuit television (CCTV) system, motion detection (NGB-ARI Delite System) and other means of surveillance to optimize their effectiveness.

2-3.6 Site Signage

Confusion over site circulation, parking, and entrance locations can weaken site security. Therefore, signs should be provided to properly orient all who are coming to the site. Signage should include on-site directional information, parking, and cautionary signs for visitors, employees, service vehicles, and pedestrians.

2-3.7 Landscaping

Landscaping design can enhance or be a detriment to the security design. Such elements as earth berms and trees can provide barriers, but all landscape features should be carefully designed to coordinate with site surveillance when the plants are fully grown. Landscape plantings can be used to conceal above-ground utility systems, but utilities should be installed underground when possible.

2-3.8 Architectural and Engineering Building Systems Design

The specific requirements for AT/FP are described in detail in UFC 4-010-01 and UFC 4-023-03, Design of Buildings to Resist Progressive Collapse.

CHAPTER 3

SUSTAINABLE DESIGN AND DEVELOPMENT

3-1 GENERAL INFORMATION

Sustainable Design and Development (SD&D) includes the design, construction, and operation of buildings to reduce negative impacts on the environment, improve the health and comfort of the building occupants, and reduce operating costs while improving building performance. SD&D requires a multi-disciplinary approach that incorporates a wide range of strategies and objectives set in *Executive Order, (EO) 13423, Strengthening Federal Environmental, Energy and Transportation Management* into the design and construction process. The Energy Independence and Security Act of 2007 (EISA 2007) increased federal energy reduction goals. The *National Guard Bureau Army Installations Division sustainable design and development goal for all MILCON projects is a U. S. Green Building Council Leadership in Energy and Environmental Design-New Construction & Major Renovations Version 3 (LEED-NC™ v3) Silver Certification. All MILCON project must be registered with the Green Building Certification Institute (GBCI) @ www.gbci.org.*

3-2 GREEN BUILDING RATING SYSTEM

The design Architect-Engineer must use the Green Building Rating System LEED-NC™ 3, developed by the U.S. Green Building Council (USGBC). The LEED-NC™ version 3 rating system is based on compliance with a series of prerequisites and credits to obtain a score within categories of recognition. Five principal categories of sustainable design, which also support other Federal goals in energy and environmental initiatives, have been identified using LEED-NC as a central organizing system:

- Sustainable site design
- Protection and conservation of water
- Design for energy efficiency and consideration of alternative sources of energy
- Optimization of the environmental life cycle of materials
- Enhancement of indoor environmental quality

The following outlines the major objectives and sample strategies for each of these sustainable design categories:

3-2.1 Sustainable Sites

Objectives:

- Promote natural areas.
- Minimize impacts on the site and surroundings.

Sample Strategies:

- Encourage alternative means of transportation.
- Protect from wind and water erosion.
- Use highly reflective paving and roofing materials.
- Use a vegetative roof surface for stormwater management.
- Restore damaged habitat.
- Brownfield Redevelopment (Urban) to conserve greenfields.
- Manage Stormwater with Low Impact Development per EISA Section 438.
- Consult EPA technical guidance for implementing EISA Section 438, EPA 841-B-09-001 @ www.epa.gov.

3-2.2 Water Efficiency

Objectives:

- Reduce the municipal water supply and treatment burden.
- Allow water to return to the water table.

Sample Strategies:

- Landscape with native plants.
- Use water-efficient, low-flow fixtures.
- Design for rainwater catchment systems.
- Use gray water systems for landscape irrigation.
- Use biological wastewater treatment systems.

- Explore the applications of Waterfree Urinals

3-2.3 Energy Efficiency

Objectives:

- Optimize energy efficiency per ASHRAE Standard 189.1-2009, Design of High-Performance Green Buildings.
- Total Building Commissioning and Enhanced Building Energy Systems.
- Encourage renewable and alternative energy sources.
- Support international ozone protection protocols.

Sample Strategies:

- Orient the building appropriately.
- Use a highly reflective Energy Star roof.
- Explore Green/Vegetated roof systems
- Specify highly efficient HVAC equipment without the use of chloro-fluorocarbons (CFC) or hydro-chloro-fluorocarbons (HCFC) chemicals.
- Provide occupant controls for all spaces.
- Use photovoltaics and renewable energy sources.

3-2.4 Material Selection

Objectives:

- Use materials with minimum environmental impact.
- Reduce, recycle and manage waste.

Sample Strategies:

- Conduct on-site recycling.
- Implement a construction waste management plan.
- Minimize toxins in materials.

- Specify certified wood and bio-based materials.
- Use biological wastewater treatment systems.
- Specify recycled content.

3-2.5 Indoor Environmental Quality

Objectives:

- Eliminate the sources of indoor pollution.
- Provide for thermal comfort of occupants.
- Provide for occupant connection to outdoors.

Sample Strategies:

- Conduct on-site recycling.
- Limit indoor air pollutants.
- Specify low-emitting materials.
- Incorporate lighting controls.
- Create a natural indoor environment.

3-3 FEDERAL GOALS

3-3.1 Energy Policy

The sustainable design and development should adhere to the efficient energy management goals and objectives stated in Executive Order (EO) 13423. Building energy efficiency goals must exceed ASHRAE Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings by 20%. The Energy Independence and Security Act of 2007 (EISA 2007), Section 431 increased the federal energy reduction goal from 2%/year to 3%/year by fiscal year 2015. All MILCON projects must install Advanced Utility Meters for electrical, natural gas, water and steam applications.

3-3.2 Environmental Initiatives

The sustainable design must meet or exceed the waste prevention, recycling, and Federal acquisition goals and objectives stated in with guidance in UFC 1-900-01, Selection of methods for the Reduction, Reuse, and Recycling of Demolition Waste and Unified Facilities Guide Specification Sections, UFGS-01355, Environmental Protection; UFGS-01572, Construction and Demolition Waste Management; UFGS-02220, Demolition. Apply where possible the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*.

3-3.3 Environmentally Preferred Products

Environmentally preferred products (EPPs) reduce effects on human health and the environment. Products are designated as EPPs after a product assessment based on their raw materials source, production, manufacturing, packaging, distribution, disposal, and recyclability. All selected materials are also required to meet industry standards for durability and cost effectiveness based on an LCCA. The comprehensive guidelines can be obtained at (epa.gov) website.

3-3.4 Facility Equipment

All facility equipment, materials, and operating systems should be based on consideration of the lowest life cycle cost analysis (LCCA) and AR 11-27, the State's energy code, ETL 1110-3-491, and the latest energy and environmental industry standards.

3-4 SPECIFIC APPLICATIONS

3-4.1 General Goals

All facility equipment, materials, and operating systems should be based on the lowest life cycle cost considerations, AR 11-27, the State's energy code, UFC 3-400-01 Energy Conservation and the latest referenced energy and environmental industry standards.

3-4.2 Passive Solar Energy Conservation

The design and orientation of functional areas should in new construction and where feasible in major additions/renovations, make use of the principles of passive solar energy design. Specific passive solar features, however, must be justified on a life cycle cost basis, demonstrating a payback in 20 years or less in order to obtain Federal support. Buildings should be located to best utilize the winter sun day-lighting and warmth, prevailing winds for ventilation, and natural landscape. Refer to *UFC 3-440-03N, Passive Solar Buildings* for design guidance.

3-4.3 Plantings

Landscaping and planting should be integrated appropriately into the design to provide shade from summer sun and to block winter winds. All landscape features should be adequately described for cost estimating proposes. All plant selections must coordinate with all antiterrorism force protection (AT/FP) goals of the site.

Landscaping can reduce direct sun from striking and heating up building surfaces. It can reduce reflected light carrying heat into a building from the ground or other surfaces. The shade created by trees, along with the effect of grass and shrubs can also reduce air temperatures adjoining the building and provide evaporative cooling. The landscape design should also incorporate water conservation principles.

3-4.4 Building Envelope

The building envelope consists of all architectural elements that define the exterior shell of the building. All heated and cooled building roof assembly must have a calculated U -

factor ($1/R_t$) of 0.025 and wall assembly must be 0.038 Btu/h/SF/F. Features include the following:

3-4.4.1 Wall and Roof Insulation

The design of the exterior envelope should optimally promote energy-efficient performance guidance in the 2005 Edition ASHRAE Handbook of Fundamentals. In doing this, the design should show that it satisfies the mechanical/HVAC calculations for envelope values submitted at the 65 percent level of design completion. The design professional should specify Cool Roof™ Systems certified by the Cool Roof Rating Council where possible.

3-4.4.2 Doors and Windows

Openings should be sized and located to balance energy conservation and the need for natural daylight. High-performance windows with efficient insulated glazing should be considered (*RE: Efficient Windows Collaborative @ www.Efficientwindows.org*) yet carefully matched to the wall thermal performance level based on HVAC heat load calculations for envelope values, including solar gain. Air infiltration should be carefully analyzed and reduced wherever possible.

3-4.4.3 Vestibules

Air locks or vestibules should be provided at the main entrance and at all corridor exits leading to privately owned vehicle (POV) parking if the facility is located in a climatic zone with a winter design temperature less than 20 °F db and summer temperature greater than 75 F wb.

3-4.4.4 Earth Embankments and Berms

Embankments and berms may be used where appropriate, provided such usage does not involve an excessive amount of retaining wall type of construction. Federal support is not authorized for retaining wall construction at the toe of the embankment (for example, where the toe of the berm is above the adjacent finished grade).

3-4.4.5 Weather Stripping and Caulking

Weather stripping and caulking shall be used to reduce air infiltration.

3-4.4.6 Building Configuration and Mass

To reduce heating and cooling costs, the building shape should result in as low an exterior surface and mass as practical and economical.

3-4.4.7 Selection of HVAC Equipment

Interior environmental equipment should be selected based on energy efficiency, including fuel sources. The use of variable air volume (VAV) system, ground source heat-pump systems, in-floor radiant heating and central heating/cooling plants for multiple facilities must meet the lowest life cycle cost for owning and operating.

3-4.4.8 Standard Building System Features

- A Utility Monitoring and Control System (UMCS) per UFGS-13801) or programmable timer with the capability to preset the appropriate temperature level for occupied and unoccupied usage of the various zones.
- Adhere to the Advanced Metering Program to meter at all buildings for water, steam, natural gas, and electric in accordance with the Energy Policy Act of 2005 and DOE/EE -0312 Guidance for Electric Metering in Federal Building (www.eere.energy.gov/femp).
- A temperature sensor to automatically shut off the heating system when the outside temperature reaches 65 °F for more than three consecutive hours.
- Door closers, where justified, on exterior and interior doors
- Operable (manual) windows
- Low-leakage dampers
- Entry Vestibules options in extreme climates.

3-4.4.9 Optional System Features

HVAC system features to consider, if economical, include the following:

- Multiple boilers
- De-stratification fans in Assembly Halls and maintenance Work Bays/Hangers areas
- Exhaust hoods that supply 80% untempered makeup air through an outer jacket of the kitchen exhaust hood (to exhaust only a limited amount of heated room air)

3-4.4.10 Domestic Hot Water

Domestic hot water heating plants should use natural gas, electric and supplemental solar panels where feasible. Other features should provide the following:

- Flow restrictors in shower heads
- Low-flow aerators in kitchen and lavatory faucets
- Separate water heaters for kitchen and small toilet areas serving full-time occupancy

- Outdoor temperature reset control for the water-heating systems may vary water temperature inversely with outdoor temperature.
- Solar water heating panels should be used where economically feasible in accordance with EISA 2007, Section 523.

CHAPTER 4

COMMON FUNCTIONAL SITE DESIGN GUIDELINES

4-1 SITE ANALYSIS EVALUATION

4-1.1 Area Suitable for Building Construction

The geotechnical investigation, the facility master plan development, and the conceptual-level site analysis process with regard to sustainable site goals should provide information clearly delineating the extent of the site area that is suitable for building construction in the initial phase of development and potential future expansion.

4-1.2 Compliance with Threat Assessment Criteria

All building complex designs should clearly indicate, to scale, the configurations of the exclusive and nonexclusive standoff perimeters on designated site plan drawings. Areas of potential building expansion should be considered when establishing standoff perimeters.

4-1.3 Urban Brownfield Redevelopment Site Selection

Select Urban Brownfield sites early in the master planning and site selection process for MILCON projects in the State/Adjutant Generals Long-Range Construction Plan (LRCP) to allow time for remediation. The U. S. Environmental Protection Agency (EPA) supports the States Brownfield and Voluntary Response Programs and their Voluntary Cleanup Programs (VCP) that promote cleanup and reuse. To review each State VCP reference EPA Brownfield State and Voluntary Response Programs at (www.epa.gov/cgi-bin/epaprintonly.cgi).

4-2 STORMWATER POLLUTION PREVENTION

4-2.1 Storm water Management Practices

The best management practices currently used in stormwater quality control includes Green Roofs/vegetative, wet and dry ponds, infiltration trenches, porous paving, and oil-grit separators. These practices have certain limitations and drawbacks. Therefore, the design A-E should carefully analyze their functional benefit and cost impact before incorporating them into the project.

Design goals are to minimize stormwater runoff by maximizing the infiltration of rainwater into groundwater and to reduce the concentration of undesirable chemicals in both groundwater and surface waters. The key to these efforts is to minimize the nonporous surface areas, which is consistent with sustainable goals for reducing the heat sink effect on site.

4-2.2 Bio-retention Ponds

Bioretention ponds may be used at most ARNG facilities. These small, inexpensive, and somewhat isolated improvements combine the absence of paving (which allows ponding and eventual infiltration of water) with the uptake and chemical conversion of some pollutants by bacteria adsorbed onto the roots of selected plant species. Often, these bacteria are the best method to reduce the concentration of nitrogenous chemical species and phosphates in surface water.

4-2.2.1 Standard Reference for Small Watersheds

The standard reference, TR-55, Urban Hydrology for Small Watersheds, contains technical calculations for bioretention ponds. TR-55 serves to determine the amount of storage required to mitigate the impact of urbanization, including parking lots.

4-3 REQUIRED PAVED AREAS

Three Army National Guard facilities require large expanses of paved areas:

- Mobilization and training equipment sites (MATES)
- Combined support maintenance shops (CSMS)
- Army aviation support facilities (AASF)

Rigid concrete pavement and or Resin Modified Pavement™ are authorized for all parking surfaces. However one option is to maximize the use of crushed stone or hardstand in lieu of pavement at maintenance facilities for ground vehicles. This material permits rainwater infiltration and recharge into the groundwater. Its usefulness decreases to the extent that the ground is compacted prior to emplacement, because the compacting reduces porosity and therefore permeability to rainwater. At AASF facilities, however, crushed stone is not an option, given the justified concern over rotor and prop wash kicking small particulates such as stones or dust into aircraft engines. For AASF Aircraft parking a Resin Modified Pavement™ or rigid concrete material must be specified.

4-4 FUEL STORAGE AND DISPENSING SYSTEM

Any fuel storage or dispensing facility must be designed in accordance with guidance in MIL-HDBK-1022A and with the State's Department of Environmental Quality, EPA, and local regulations. Fuel storage may be either above or below ground. Above-ground storage tanks should be concrete encased. Placement of tanks in proximity to buildings should take into account fire protection codes, including NFPA 30, or should be fire-rate tanks accordingly. Fuel-dispensing units for the direct fueling of ground vehicles should be in accordance with standard MIL-848-2 and should have an output capacity no greater than 26 gpm. The pump should be located in the dispensing unit rather than the dispensing tank. Special approval is required for high-speed, large-capacity units involving multiple dispensing systems and a pump located in the tank. The pump should be located in the dispensing unit rather than in the dispensing tank. In addition

to fueling individual vehicles, the system must be equipped for bottom-loading tank trucks and trailers. The system should meet all Federal, State, and environmental regulatory requirements.

In accordance with *Army Regulation (AR) 70-12 Fuels and Lubricants Standardization Policy for Equipment Design, Operation, and Logistic Support*, all plans for new construction, modification, or upgrading of petroleum facilities containing fuel purchased with federal funds must be submitted prior to bidding for review and technical assistance to:

U.S. ARMY PETROLEUM CENTER (APC)
Facilities and Operations Division
8725 John J. Kingman Road, Stop 6421
Fort Belvoir, VA 22060-6241

Questions related to fuel-dispensing systems can be answered by calling the APC at:

- (703) 767-0646 or DSN 427-0646
- (703) 767-0648 or DSN 427-0648

4-5 **CONTROLLED WASTE-HANDLING FACILITY**

The controlled waste-handling facility should be a separate building constructed of noncombustible materials. It should be in close proximity with flammable/combustible storage and bulk POL storage. As a hazard, it should be located at the appropriate distance from other buildings in accordance with fire safety and building codes applicable for the State, such as NFPA 30 and the IBC. The facility should be within a secured compound and located to minimize the impact of contamination by accidental surface runoff. A prefabricated structure may be used. A 6-ft-high chain link fence or permanent partition should be designed within the enclosure to separate the various types of controlled waste. The latest Federal and State environmental agency waste management requirements for controlling waste should be followed.

A single-point grounding system shall be used to ground flammable materials in metal containers. It should be wired in series to the ground point, with an anchor bolt installed in the concrete floor for each separate, segregated area within the enclosure. Fire protection systems, explosion relief construction, air conditioning, and heating are not authorized unless required by the type of waste stored. Adequate ventilation should be provided at the edge of the concrete slab and the walls to prevent spontaneous combustion of escape fumes from material storage containers. If the roof is flat or nearly flat, a continuous ridge vent or other roof-top ventilation should be provided.

The controlled waste-handling facility should have one personnel door, one 6-ft-wide by 10-ft-high overhead coiling door for forklifts, and one 6-ft-wide by 8-ft-high overhead coiling door for non-forklift operations. The floor should be constructed of reinforced

concrete and must have a chemical and moisture-resistant seal (such as an epoxy-based system) with liquid-tight, chemical-resistant joint sealants at any floor joints. It should have a spill/leak containment raised edge. The slab reinforcement design must resist cracking to prevent leaks in the floor containment membrane and to support the loads from stored materials. The design A-E must comply with environmental regulations regarding containment sump capacity.

4-6 **COVERED (ENCLOSED), UNHEATED VEHICLE AND PARTS STORAGE**

Covered, unheated vehicle storage and parts spaces should be sized according to the program documents. The facility should have one personnel door, one 6-ft-wide by 10-ft-high overhead coiling door for forklifts, and at least one overhead coiling door for vehicular operations, with additional vehicle doors as the size of the facility dictates. Doors must be sized for vehicle access according to vehicle clearance requirements, and protection for door edges should be provided.

4-7 **COVERED STORAGE AREA**

Covered storage areas should be sized according to the program documents. Vertical maneuvering clearance should be 14 ft clear height, measured at the one-third point of the underside of the lowest sloping roof structural elements. The covered area may be enclosed when indicated in the program documents. The design should incorporate a super-flat reinforced concrete slab suitable for high-stack forklift traffic and load support.

4-8 **WASH PLATFORMS FOR VEHICLES/EQUIPMENT**

Wash platform sizes depend on the type of vehicles to be washed. Generally, the minimum standard-sized platform is 25 ft by 40 ft. Wash platforms should be equipped with settling basins prior to discharge to trap grit, and with an oil and grease interceptor in accordance with all environmental requirements in Federal, State, and local codes. The water supply should be sufficient to provide a flow of 40 gpm at 40 psi at each hydrant.

4-9 **BULK POL STORAGE**

Consolidated above-ground, liquid bulk storage of new petroleum, oils and lubricants generally requires temperature and ventilation control. It should be next to the Controlled Waste Handling areas and close to the Flammable/Combustible Storage area; but isolated from all other shops and storage rooms.

4-10 **FLAMMABLE MATERIALS STORAGE**

Consolidated storage of bulk solid flammable materials (not fuels). It is generally unheated, and requires ventilation. It should be next to the Controlled Waste Handling areas and close to Bulk POL Storage, but isolated from other shops and storage rooms.

The flammable materials storage (FMS) building may be a separate prefabricated metal building or constructed of concrete masonry units (CMU) or the same material as the main building as long as the design meets all Federal, State, and local codes, regulations, and ordinances. If designed as part of the main building, the FMS should have an exterior door and may have an interior automatic self-closing noncombustible

fire door, and the entire storage area must be surrounded by a liquid-tight 4 in. high curb. A roof- or wall-mounted exhaust fan and a wall or door louver near the floor should be provided to prevent hazardous vapor from accumulating within the area. If the FMS is located in a separate building it is generally not heated and is considered a Class 1, Division 1 hazardous location for electrical work. The net floor area can be obtained from the approved program documents. The FMS may be equipped with metal shelves. No floor drain is to be provided. If the interior area is to be separated for item or organizational control, an industrial wire mesh partition may be provided.

CHAPTER 5

COMMON FUNCTIONAL PLANNING AND BUILDING DESIGN GUIDELINES

5-1 FUNCTIONAL PLANNING RELATIONSHIPS

All functional site and building design components should respect fundamental planning relationships that optimize efficient operations at Army National Guard facilities.

Each facility-type design guide, used in combination with this document, includes specific information related to the topics discussed in the following paragraphs.

5-1.1 Proximity

All program functions listed in NG PAM 415-12 for each facility type have priorities of functional proximity to one another. Some should be adjacent because of functional co-dependence, and others isolated because of incompatibility.

Each facility-type design guide includes adjacency matrices related to all functions to be located in the facility. In addition, functional relationship diagrams, which delineate each function in proportional scale, are included to assist the design A-E. These diagrams are not intended to establish conceptual design direction but to assist in the functional comprehension process.

5-1.2 Expandability

The location of those functions with the greatest potential for future expansion warrants careful consideration. Such functions should be placed either at the building perimeter, allowing incremental growth in a new addition, or adjacent to flexible use areas that can be converted into additional dedicated functional space. Facility expansion should be considered in establishing AT/FP standoff zones. All designs should accommodate 25% expansion without affecting the initial AT/FP standoff zones.

5-1.3 Special Environmental Requirements

Unique space environmental factors to consider during the space planning process include:

- Height requirements
- Noise and vibration isolation
- Requirements for utility support
- Public versus secure spaces
- Code-required fire separations

5-1.4 Access to Natural Light

The location of classrooms and open administrative areas should maximize exposure to natural light.

5-1.5 Service Efficiency

Common service functions, including toilet facilities and mechanical and electrical rooms should be grouped horizontally and vertically. The design should provide adequate space for servicing and replacing mechanical and electrical equipment. Where possible in new construction and major renovation locate mechanical/electrical rooms on outside walls to allow unrestricted equipment service and replacement activities.

5-2 GENERAL BUILDING CIRCULATION

The circulation area authorization in the program documents is for inter-functional use only. The individual functional space allowances include intra-functional circulation. The designer should layout the building spaces in the most efficient manner with the smallest ratio of circulation space/occupied space.

5-2.1 Direct Routes

Circulation areas should provide direct access to functional spaces without the use of offsets or elaborate circulation patterns.

5-2.2 Corridor Width

Corridor width should be based on the anticipated use but should not exceed 6 ft, unless required by the calculated exit width as determined by building codes (or NFPA 101). The minimum clear width is governed by means of egress sections of these codes.

5-2.3 Lobby Requirements

The building should have only one lobby that is easily observed from the adjacent functions.

5-2.4 Vertical Circulation

Stairways should be strategically located adjacent to corridors. Elevators are authorized for all two-story facilities to allow access and freight handling between floors.

Stair placement must be evaluated as part of the means of egress travel distance limits, dead-end limitations, and exit discharge requirements in the codes.

5-3 APPROPRIATE BUILDING MATERIALS

The Army National Guard has extensive experience resulting in lessons learned relative to the durability of both interior and exterior building materials. Exterior building materials should comply with the performance guidelines presented in Chapter 6, Common Architecture and Engineering Technical Guidelines. Each facility-specific design guide contains tables of generic architectural interior finish materials. These represent performance level expectations; alternatives with the same characteristics may be considered for use.

5-4 HVAC, ELECTRICAL, AND TELECOMMUNICATIONS SYSTEMS

During the entire development of the building design, it is important to maintain a focus on the design intent related to fundamental environmental, electrical, and communications systems. Emphasis should be on indoor air quality, energy, efficiency, flexibility of needs, and adaptability for future technological advancement. The size of the mechanical, electrical, and telecommunication room(s) depends on the geographic location as well as the amount and size of the actual equipment needed to provide the heating, ventilation, and air conditioning (HVAC), electrical, and telecommunications support for the entire building. The floor plan layout, drawn to scale and showing the required equipment, should justify the actual floor space required. The building mechanical, electrical, and telecommunications equipment should be housed in separate rooms with direct outside access where possible. The telecommunications room should be environmentally controlled to protect the equipment from overheating.

5-5 FACILITY MAINTENANCE AND CUSTODIAL AREA

The facility maintenance and custodial area should be located on an outside wall to allow direct access for taking equipment and supplies in and out for maintenance and upkeep. The design may include wood or metal shelving attached to the floor and installed along one wall. One custodial room may be provided per floor. Each should have one mop sink, shelving on the wall, and a wall-mounted broom and mop rack.

5-6 REGIONAL CONSIDERATIONS

ARNG facilities are constructed in very diverse climates. The design A-E must research the proposed materials and systems in detail to verify their appropriateness, particularly related to the building envelope. Consideration should include durability to the elements and availabilities, particularly in remote locations. Reference *UFC 3-440-05N, Tropical Engineering for ARNG Tropical Regions for (Southern Florida, Hawaii, Guam, Virgin Islands and Puerto Rica) planning, design and construction*. Reference *UFC 3-130-07 Arctic and Subarctic Construction for Buildings for ARNG Cold Regions facilities*.

5-6.1 Mechanical Systems

In tropical and semi-tropical climates, mechanical cooling should be considered in storage areas as well as occupied portions of the building. Regions that experience long periods of high humidity may require dehumidification, not only for human comfort but also to avoid damage to stored equipment and supplies. Analysis should be performed before airside economizers are selected, as they are frequently not cost effective in hot, humid climates. Intense sun may justify external sun shades on windows. Mechanical system protection from tropical storms should be considered.

In extremely cold climates, heating is required in almost all building areas. Special attention must be given to the potential freezing of pipes located in outside walls, stairways, or any unoccupied area. Outside air intakes and exhaust outlets must be protected from snow accumulation. Intakes ducts and coils must be designed to avoid ice accumulation and to dispose of water resulting from melting ice. Glycol solution

should be used in preheat coils to avoid coil freeze-up, and special care must be exercised to ensure proper mixing of outside and return air at AHU inlets. Some form of perimeter heating, such as baseboard radiation, should be considered. Standby boilers, pumps, and other equipment should be provided to prevent building freeze-up in the event of major equipment failure.

5-6.2 Architectural Considerations

Observation and recognition of the reasons for certain materials being favored locally assists the design A-E in evaluating materials that are intended to reflect this knowledge. The design A-E is encouraged to adopt the same practical approach to selecting materials that reflect the community environment. The design A-E is cautioned to avoid introducing materials inappropriate to a climatic region.

The following are some examples of impacts on design resulting from environmental and climatic extremes:

- Ground moisture content, which may have an impact on slab design and elements below grade
- Dew point/condensation management in extremely cold climates or in spaces that change from conditioned to unconditioned based on use (and thermal breaks in insulated window units to prevent condensation/frost in cold climates)
- The position and type of the air retarder, vapor retarder, waterproofing, and dam-proofing in exterior walls and roofs in climatic extremes
- Perimeter below-grade insulation in extremely cold climates
- Piled (plowed) snow and ice against the perimeter of the building, and de-icing chemicals and water/slush ice tracked inside
- Fenestration and other shading considerations in very hot climates
- Alkaline content of soils, which may have an impact on concrete and reinforcement
- The effect of extreme temperature differentials on movement isolation and movement control joints, particularly masonry
- Drifting snow against edges of the building in cold climates, along with snow loads on the roof related to structural design

5-6.3 Areas of Seismic Extremes

Structural engineering design requirements for areas of seismic extremes are provided in the International Building Code, Structural Design and UFC 3-310-04 Seismic Design for Buildings. In addition, the design A-E should ensure that ceilings and ceiling-hung/structurally supported elements are braced, particularly in assembly areas, and that elevator hoist-ways have proper tolerances.

5-6.4 Areas of Wind Extremes

In areas subject to extreme wind conditions, structural design should be based on the most stringent requirements of the IBC or local building codes and regulations. The design A-E should consider persistent wind effects in cold climates on door entries, door closer operation, and glazing unit design.

5-7 COMMON FACILITY FUNCTIONAL AREAS

The following functions have the same design guidance for inclusion in all facility types.

5-7.1 Break Room (Area)

The break room space should be conveniently located for the majority of the building occupants and contain a vending area. The location needs to be acoustically isolated or remote from areas needing a quiet environment. It should include vending machines plus tables and chairs in the amount appropriate to the size of the facility.

5-7.2 Toilets and Showers

The approved program documents should indicate the number of designated males and females in order to proportion the authorized space appropriately. The appropriate plumbing code should be used to determine the specific number of each type of plumbing fixtures.

5-7.3 Physical Fitness Area

The physical fitness area is used on a daily or weekly basis for physical training and requires construction to withstand the impact of furnished exercise equipment. The area should be located at an appropriate distance from administrative and classroom functions for acoustical reasons. The physical fitness machines and equipment are classified as portable equipment to be purchased through standard supply channels, not with Federal construction funds.

5-7.4 Mail Room

Mail room is a facility operated by or for the National Guard/Department of Defense (DOD) for the receipt and delivery of mail for military units or other authorized organizations and agencies by entities outside the National Guard/DoD. This does not include mail rooms that receive mail distribution that was initially received at a central DOD mail handling facility.

Mail rooms in inhabited facilities should comply with the minimum design standards as addressed in the Unified Facility Criteria (UFC) 4-0101-01. The following are some of

the minimum anti-terrorism design standards for mail rooms addressed in the UFC 4-010-01:

- Locate mail rooms on the perimeter of the building.
- Locate mail rooms as far from heavily populated areas of the building and critical infrastructure as possible.
- Ensure that mail rooms are well sealed between their envelopes and other portions of the buildings in which they are located to limit migration into buildings of airborne chemical, biological, and radiological agents introduced into mail rooms.
- Provide separate, dedicated air ventilation systems for mailrooms to ensure airborne chemical, biological, and radiological agents introduced into mailrooms do not migrate into other areas of buildings in which the mailrooms are located.
- Provide dedicated exhaust systems within mailrooms to maintain slight negative air pressures with respect to the remainder of the buildings in which the mailrooms are located so that the flow of air is into and contained in the mailrooms.

5-7.5 **Nursing Mothers Room**

All ARNG facilities that include Administrative Areas are authorized a net area of 80-square feet enclosed room with complete environmental systems and one cabinet/counter mounted 16"x16" stainless steel service sink to support this effort. For information on State Breastfeeding Laws or Civil Codes refer to the National Conference of State Legislatures website: (ncsl.org/programs/health/breast50.htm).

CHAPTER 6

COMMON ARCHITECTURE AND ENGINEERING

TECHNICAL GUIDELINES

ORGANIZED BY Construction Criteria Base, (CSI MasterFormat™ 2004 Edition) Unified Facilities Guide Specifications (UFGS) (USACE, NAVFAC, AFCEA & NASA) Whole Building Design Guide: (www.wbdg.org/ccb/browse_org.php.)

SECTION 1 CIVIL, SITE, AND LANDSCAPE DESIGN

DIVISION 01 GENERAL REQUIREMENTS

Sustainable Site Development Goals

The major site development objective is to preserve the character of the site by retaining natural features such as ground slopes, drainage patterns, trees, and other natural vegetation to the greatest extent possible. The design A-E should analyze the site to locate and orient the building and other structures so they are compatible with natural site features, sun orientation, and prevailing winds. The overall site design should conserve energy, allow easy access to public roads and utilities, and support the most efficient operation. Careful consideration should be given to future expansion of the facility during development of the initial design.

Site Preparation

Site preparation should include the work for demolition and clearing, grubbing, stripping, stockpiling topsoil, excavation, and rough grading. It should not include the excavation and backfilling required for foundation walls and footings nor the finish shaping and proof rolling of the subgrade under pavements and floor slab construction. The subgrade should be such that the cut and fill are roughly balanced to provide the most economical site preparation. If required, demolition should include removal of all surface features in conflict with the new construction as well as underground utility lines and structures. The design A-E shall prepare a suitable stormwater pollution prevention plan (SWPPP) and obtain the National Pollution Discharge Elimination System (NPDES) permit during the construction and post-construction phases in accordance with local requirements.

Environmental Protection - UFGS 01 57 20.00 10:

Storm Water Pollution Prevention Measures - UFGS 01 57 23:

Construction and Demolition Waste Management - UFGS 01 74 19:

Recycle/Recovered Materials - UFGS 01 62 35:

Demolition - UFGS 02 41 00:

Removal and Salvage of Historic Building Material - UFGS 02 42 91:

Clearing and Grubbing - UFGS 31 11 00:

Earthwork - UFGS 31 00 00:

Excavation and Backfill - UFGS 31 23 00:

Subsurface Drilling, Sampling, and Testing - UFGS 02 32 00:

Soil Surface Erosion Control - UFG 31 32 11:

During the construction phase, the appropriate control measures (such as straw bales silt fence, sediment traps, sediment basin, and other approved practices) shall be employed to minimize erosion in order to comply with the latest environmental and State requirements.

Utilities - General Information

All building utility service lines should be underground where possible. The design A-E should verify that all utility services will be available at the site when the intent is to connect with or extend an existing municipal system. The design A-E shall comply with and obtain approval with respect to all municipal requirements. The contract documents should stipulate that the contractor is to coordinate with local utility companies on the division of work to the extent necessary to ensure that when the facility is complete, all utility services will be connected and operational without further cost. The Federal share of the total cost of all utility service connections must not exceed 15 percent of the Federal share of the building cost. Exposed utility components and light standards may have bumper guards or posts if a location outside the vehicle traffic area is not feasible. Emergency power may be provided when sewage lift stations are necessary. The length of the service line for each utility is limited to the distance of the shortest run from the point 5 ft outside of the building to the property line adjacent to the public right-of-way.

Potable Water

Water Distribution - UFGS 33 11 00

Ductile-Iron pipe and fittings, PVC, Type K copper for a line size of 2 in. or less in diameter or an equivalent pipe should be used for the service connection, unless specific circumstances require the use of some more expensive material. If a public water system is not available in the general area, a well may be utilized if consistent

with the requirements of the local authority having jurisdiction. Line extensions 6 in. or more in diameter should be ductile iron or plastic.

Fire Protection

The design A-E should consider the size of the structure, type of construction, and exposure to fire hazard that the structure creates or receives from nearby buildings. The fire apparatus access requirements should be considered as well as the exterior fire rating of nearby buildings on site and the building being designed. Except in cases of conflict with State requirements, exterior fire protection should be in conformance with NFPA and UFC 3-600-01 Fire Protection Engineering for Facilities.

Sanitary Sewage Systems - UFGS 33 30 00

Piping should be vitrified clay, concrete, corrugated metal, PVC, or of equivalent quality and cost, unless special circumstances require the use of a more expensive material. The sewer should be gravity type. If a municipal system is not available in the general area, a packaged sanitary treatment system or septic system may be utilized.

Natural Gas Distribution - UFGS 33 51 15

Normally, natural gas is the fuel of choice if available at the site. Piping material should be vinyl clad Schedule 40 black steel or thermoplastic gas pressure pipe and fittings conforming to American Society for Testing and Materials (ASTM) D2513.

Stormwater Retention Basin Design

The design should separate normal stormwater sheet flows (from roofs or other areas) from possible contaminated stormwater sheet flows (occurring at military and POV parking areas). Non-contaminated flows should be designed to run off downstream from contaminated sheet flows. Contaminated sheet flow management (including retention basins, grit interceptions, and oil-water separators) is authorized for Federal support if required by the approved SWPPP and the NPDES permit (based on 1-hr rainfall during a 10-year event and on the local limitations thresholds imposed on such effluents). Designers should reference EPA 841-B-09-001 Technical Guidance on Implementing Stormwater Runoff Requirements and UFC 3-210-10 Low Impact Development Manual.

Privately Owned Vehicle Parking - UFGS 01 50 00

The authorized amount of paved area for circulation and parking is based on 35 yd² per parking space. If on-street parking is available, the area allocation may be reduced to the size of the parking space meeting local zoning ordinances. Paint striping may be used to define individual parking stalls, but stalls shall not have identification marking except for the physically disabled if a competitive employee position is authorized.

Concrete curbs may be used around the pavement edges. Designers should reference UFC 3-210-10.

Additional Paved Area Requirements - UFGS 32 13 13.06

The designer should incorporate additional areas of pavement for vehicular access to a wash platform or fuel-dispensing facility, or both, if authorized, in the military parking or storage area. A security fence should enclose these additional areas of pavement along with the platform or fuel facility, or both.

Bituminous Concrete Pavement - UFGS 32 10 00

Resin Modified Pavement™ Surfacing Material - UFGS 32 12 18

Access Roads and Entrance Roads - UFGS 32 13 13

The design A-E should consult the approved program documents for the authorized amount of paved area. The number of square yards of pavement stated in the approved program documents is only approximate; the actual amount will be as needed to provide the shortest runs possible when considering site conditions and economical locations of the building, dock(s), parking, and existing roads. The primary access or entrance road may be 24 ft wide, with rigid or bituminous concrete curbs, provided that an underground drainage system is avoidable. Secondary access roads, service drives, and circulation lanes in parking areas are limited to a width of 20 ft.

The design should provide an adequate turning radius based on the types of equipment driven or towed. Secondary access roads and service drives should not have curbs unless dictated by the most economical storm drainage solution. The authorization of paving for the parking areas includes paving for circulation lanes.

Pavement Standards - UFGS 32 10 00

A rigid pavement section should consist of a 6-in. or 8-in. concrete slab with shrinkage or temperature-welded wire mesh steel. The 6-in. thickness applies to wheeled vehicles, and the 8-in. thickness applies to tracked vehicles. Generally, concrete should be placed directly on a compacted subgrade, unless existing soil conditions dictate an aggregate base (a thickness of 6 in. maximum). An alternative to the rigid pavement section is to use roller-compacted resin modified pavement. If the design A-E determines that local soil conditions necessitate a more costly paving section, special justification is required before Federal support can be obtained for the additional paving cost.

02751 Military Vehicle Parking Pavement Requirements

The designer should consult NG PAM 415-12 for the area and type of paving to provide for military vehicle parking. The area includes space for parking the vehicles and

circulation. The paving should consist of Portland cement concrete, and the design should be based on soil conditions and on the maximum loads anticipated but should in no case be less than a 4,000-lb wheel load and 40-psi tire pressure.

02761 Fuel Truck Parking

Fuel truck parking containment is required and overhead protection is allowed. When more than one fuel truck is authorized, a spacing of 10 ft should be maintained between vehicles when parked.

02754 Trash Container Pad

A concrete pad may be provided at an appropriate location for storage of a truck-operated trash container. The selected location may take into account the ease of access by building users, visibility, and access for dumping and removal (the location generally is not inside the fenced compound). Screening may consist of walls or plantings.

SECTION 2 EXTERIOR IMPROVEMENTS

Concrete Sidewalks (Porous Asphalt) - UFGS 32 16 13

Walks connecting the primary and secondary building entrances to the parking area(s) and to the main vehicular access points should be porous asphalt. The maximum width may be 6 ft, except at the main entrance/flagpole location, where it may be 10 to 15 ft. The total area should not exceed the amount authorized in the program documents without prior approval from the Military Department or the CFMO. The designer should reference UFC 3-210-10 for permeable pavement design.

High Security Chain Link Fences and Gates - UFGS 32 31 13.53

The security-type fence must be a six (6) feet high, nine gauge, chain-link metal fabric with a twelve inch high, three strand four point barbed wire 45 degree anti-climbers to enclose the secured areas. Vehicle gate(s) may be swinging or rolling type. The following areas should be provided with security fencing: military vehicle parking; fuel storage and dispensing system; service and access aprons; aircraft parking; wash platform; lubrication and inspection rack; covered, unheated storage; cannibalization area; and loading ramp. Fencing should be located no more than 5 ft from the edge of the paved areas unless safety or security demands a greater distance.

Irrigation Systems - UFGS 32 84 24

If an irrigation system is proposed, it should be in the landscape budget. The designer should select an efficient landscape to reduce potable water consumption by using native or adapted plants, captured rainwater or grey water systems.

Fine Grading and Seeding - UFGS 32 92 19

The area within the limits of construction should be fine graded and seeded to provide proper site drainage and erosion control. The limits of construction should be clearly indicated on the project plans, and any damaged surface cover outside of this limit must be restored to its previous condition. The bottoms of drainage swales or ditches and embankment slopes steeper than 1 ft vertical to 4 ft horizontal should have sod instead of seeding. Banks steeper than 1 ft vertical to 3 ft horizontal should be stabilized with ground cover plants or with 3 in. of crushed aggregate. Steep slopes should be held to the absolute minimum and selected only when most economical. Importation of topsoil is authorized if the existing topsoil is insufficient to provide adequate cover.

Exterior Plants - UFGS 32 93 00

Plantings should include the furnishing and planting of new trees, shrubs, ground cover (other than sodding or seeding), irrigation systems, fertilizing, mulching, staking, erection of temporary barriers, watering, and general maintenance operation required to establish healthy growth after transplanting.

Landscaping - UFGS 32 05 33

The designer should include plantings as an integral part of the project planning and should clearly indicate the location, size, and quantity on the plans for bidding purposes. The planting design shall be simple and orderly, using a minimum of plant types and materials for framing and background aesthetics of the building and the screening of service areas, parking areas, and other objectionable views. Solar orientation, plantings, and berms should all be considered during early stages of design. Plant and tree selection should provide permanent low-maintenance vegetation appropriate to the location. Selected plant material shall be of local, hardy species that are tolerant of site-specific conditions. The design A-E should consider adjacent structures to prevent adverse impact. Trees should be carefully selected and located to prevent clogged gutters and drains from leaves and seeds and blocked sewer lines from root infiltration. Topsoil should be 4 in. thick unless there is a surplus from on-site project excavation grading.

In addition to aesthetic values, landscaping provides an opportunity to enhance the energy efficiency of the facility. Refer to Chapter 3, Sustainable Design.

SECTION 3 STRUCTURAL ENGINEERING DESIGN

GENERAL REQUIREMENTS

General Information

The structural system of the building should consist of noncombustible materials or heavy timber-type construction. The construction should generally be of open-web steel joists or prefabricated light-gage steel trusses supported on masonry bearing

walls, tilt-up concrete, or steel wide-flange beams or joist girders and columns. Pre-engineered metal buildings are acceptable where economically feasible.

Structure Height

The designer should keep the building heights to a minimum to reduce construction and operating cost. The interior height from the finished floor to the bottom of the roof structure system (or upper floor structure) should not exceed the limitations stated in each facility-type design guide (plus or minus 4 in. to accommodate masonry courses). Where the roof structure is sloping, the clearance is to be measured at the lower end of the one-third point of the triangle formed by the sloping roof arrangement. Care shall be taken to maintain the maximum authorized clearance at the one-third point. To accomplish this when longer spans are required, the design A-E can reduce the slope. The limit of the slope reduction is the minimum that the manufacturer recommends in order to achieve a roofing system that is warranted for 15 to 20 years.

Seismic Design Considerations

The design and construction of all new buildings located in areas of high probability of seismic activity must be in accordance with the International Building Code Section 1910, Seismic Design Provisions. The designer must reference UFC 3-310-04 Seismic Design for Buildings.

Division 03 CONCRETE

03200 Concrete Strength

Compressive strength should generally be 2,500 to 3,500 psi at 28 days after placement, unless a stronger concrete is justified by the unique technical requirements for a building type and identified in the facility-type design guide. All concrete related work must be in accordance with the latest recommendations of the American Concrete Institute. For extreme conditions such as cold climates, deicing chemicals and sulfate-containing solutions refer to the International Building Code Chapter 19.

31 60 00 Foundations

Bearing wall foundations may be CMU (with the core filled and grouted) or reinforced concrete foundation walls on continuous concrete spread footings as a standard. (The standard for columns is spread footings.) Special foundations include wood, steel, or concrete piles; concrete grade beams may be used if required by the soil investigation survey and justified by a Declaration of Uniformity of Area Soil Conditions. The top of the interior bearing wall and column footings should generally be 6 to 8 in. below the bottom of the floor slab. The bottom of the exterior bearing wall and column footings should be just below the maximum frost depth or 1 ft 6 in. below the outside finished grade, whichever governs. Footings should be lower where required for plumbing and other underground utilities, including risers at the column footings. For entrances in

cold climates, the designer may consider the use of foundations or grade walls under concrete stoops (which are almost flush with the bottom of the doors) to prevent door interference due to upward displacement of the stoop by frost action.

03000 Slabs on Grade

The slab should be poured in a single layer, with non-galvanized shrinkage and temperature steel placed at mid-point of the slab thickness on no more than 6 in. of granular base, and surfaced with a standard troweled finish. Generally, a 4 in. slab thickness and temperature-welded steel wire mesh are adequate except for special areas and uses indicated in the individual facility-type design guides. Instead of welded wire mesh, the design A-E may consider fibrous concrete. A steel angle or other type of protection may be used to protect the concrete edge of a vehicle access door threshold.

SECTION 4 ARCHITECTURAL DESIGNS

GENERAL INFORMATION

WHERE DESCRIBED IN THESE DESIGN GUIDES AND REFERENCE PUBLICATIONS, THE STANDARDS FOR MATERIAL QUALITY AND CONSTRUCTION ARE THE MINIMUM REQUIRED TO SUPPORT FEDERAL FUNDING FOR A PROJECT. THE USE OF CONTRACTOR OPTIONS AND PERFORMANCE-TYPE SPECIFICATIONS IS ENCOURAGED. THE BUILDING MUST BE OF NONCOMBUSTIBLE CONSTRUCTION, AND ALL MATERIALS MUST HAVE A FLAME SPREAD RATING OF 25 OR LESS IN ACCORDANCE WITH ASTM E84. REFER TO AR 190-51, APPENDIX D, FOR THE PHYSICAL SECURITY REQUIREMENTS FOR FUNCTIONAL AREAS STORING OR HAVING SPECIAL TOOLS, EQUIPMENT, OR REPAIR PARTS.

DIVISION 04 MASONRY

Parapet Walls - UFGS 04 20 00

Parapet walls, up to a maximum height of 18 in., are authorized. Where parapet walls are constructed of CMU, they should have a one-piece truss-type (industry standard) horizontal reinforcing element every second or third course. Vertical reinforcing should be used in seismic zones to comply with the applicable building code. The design A-E should pay special attention to eliminate differential expansion compared with walls below as indicated by movement in control joints.

Exterior Walls - UFGS 04 20 00

Where masonry is used in exterior walls the material may be face or common brick with CMU backup forming a bearing wall. A concrete tilt slab or other suitable system can be provided if the cost is equal or less. For non-cavity wall construction with CMUs at the exterior, the design A-E should consider whether a moisture-resistant film or other

barrier would assist in moisture control (with a non-bond-breaker type of barrier) and whether to permit or reduce moisture movement.

DIVISION 05 METALS

Miscellaneous Metals - UFGS 05 50 13

Lintels may be steel angles, masonry, or precast masonry units. The concrete edge of vehicular door openings shall have a steel angle or a similar type of protection.

Corrosion Resistance

The design must prevent corrosion and electro-galvanic activity under all dissimilar metal-to-metal and metal-to-alkaline material conditions.

DIVISION 06 WOODS AND PLASTICS

Wood Roof Support - UFGS 06 10 00

The roof system should normally consist of a lightweight, noncombustible type of construction. As an alternate, the structural system may be of heavy timber-type construction (defined as a minimum of 2-in.-thick decking and 6-in. by 8-in. minimum-size joists, purlins, and beams) when proven to be more economical than steel construction and where permitted by the building code.

DIVISION 07 THERMAL AND MOISTURE PROTECTION

Insulation

The exterior walls, penetrations, and roof should be insulated to reduce the heat transmission U-factor and energy cost in accordance with the State Energy Code or ANSI/ASHRAE/IESNA Standard 90.1-2007.

Slab Perimeter Insulation - UFGS 07 21 13

Perimeter insulation should be provided for slab-on-grade floors to reduce the U-Factor to the same as that of the exterior wall insulation. The insulation should be arranged to prevent an uninsulated gap at the wall and floor juncture.

Mineral Fiber Blanket Insulation - UFGS 07 21 16

The installation of batt insulation above suspended ceilings is not recommended due to the likelihood of creating a condensation problem. However, the roof insulation may be installed below the roof deck if this does not create a potential condensation problem.

Roofing Systems - UFGS 07 22 00

The roof system should normally consist of a lightweight, noncombustible type of construction. The roof construction may be any of the following:

- A composite built-up roof (3-ply minimum and 4-ply maximum glass fiber felts)
- A single-ply membrane roof (ethylene propylene diene monomer [EPDM], ballasted, partially or fully adhered, or mechanically fastened)
- A standing seam metal roof

All roofing systems should be of a quality to have a twenty (20) year warranty. Proposals to use other roofing systems or slopes exceeding 3 in. per foot must be justified by an economic analysis. Walking treads may be provided if required to maintain roof-mounted equipment. Drainage should be toward the perimeter of the roof, with a minimum slope of ¼ in. per foot, into scuppers and downspouts discharging onto grade. Calculations of roof slope should allow for roof-supporting member sag to reduce ponding. Refer to the National Roofing Contractors Association [NRCA] Roofing and Waterproofing Manual.

Bituminous Roofing - UFGS 07 52 00

Where selected, built-up bituminous roof systems should be applied over rigid insulation for heated buildings. Metal decking with the appropriate corrosion protection on both sides may be used as the supporting substrate for insulated and uninsulated roof applications. The appropriate base sheets recommended by the manufacturer must be used for insulated roof applications. Condensation and the location of the dew point (such as at soffits) must be considered to prevent occurrence at the decking or the bitumen bond. Two-in. wood decking may be used as an alternate for such special conditions.

Elastomeric Membrane Roofing - UF-07530

The same recommendations apply as for built-up bituminous roofing.

Sheet Metal Roofing - UFGS 07 61 14.00 20

If standing seam metal roofing is selected, the authorization generally is for the less costly system using a galvanized or aluminized, painted metal roofing supported by metal purlins. The appropriate thickness of fiberglass batt insulation should be placed under the metal roofing and over the top of the purlin.

Roof Restraint Protection

Protection for service staff on the roof should consist of either an extension of the parapet, guardrails, or a tie-off system. The local OSHA office can provide the ruling on the appropriate method. Refer to OSHA standards regarding walking-working surfaces in 29 CFR 1910.21–1910.23 and regarding fall protection in 29 CFR 1910.23(c)(1)(c)(3) and 29 CFR 1910.132(a).

DIVISION 08 OPENINGS

Exterior Doors - UFGS 08 11 13

All exterior doors, including rollup doors entering into heated or air-conditioned areas, should be insulated. Exterior doors providing access to storage rooms for tool and repair parts and to supply rooms should be hollow metal with fixed pin hinges of suitable weight on a hollow metal frame. Main entrance doors and those connecting directly to POV parking areas may be incorporated into a vestibule, particularly in areas of climatic extremes. If the entrance doors lead to a major administrative area, they may consist of commercial-grade aluminum and glass store front systems. Secondary doors, which are generally for emergency egress only, should not be fitted with glass panels, transom glass, or sidelights for security reasons. Where required by code, panic hardware should be installed on all exterior exit doors. Only main entrance doors may have concealed door closers; all other frequently used doors should have surface-mounted closers. Ball bearing hinges should be used only for high-frequency usage doors or where fire safety governs. Kick and push plates may be installed on frequently used doors.

Wood Interior Doors - UFGS 08 11 00

Interior doors and frames should generally be hollow metal for durability. Kick and push plates may be installed on frequently used doors. Solid-core wood doors with a standard finish may also be used. Interior doors providing access to storage rooms for tool and repair parts and to supply rooms should be hollow metal with fixed pin hinges of suitable weight on a hollow metal frame. The use of wood doors is not encouraged in heavy traffic areas because wood is less durable than metal. Interior doors may be recessed when the occupant load, as identified by the building code, requires a door to swing outward into the direction of egress. Doors may have surface-mounted door closers. Closers are required by code at fire-rated doors.

Motor-Operated Doors

Motor operation is authorized for vehicle maintenance workbay doors, warmup bays, hangar doors, and the most frequently used United States Property and Fiscal Office (USPFO) warehouse overhead supply doors. Motor-operated overhead doors are not authorized for vehicle storage buildings, but chain-operated overhead doors may be used.

Door Sizes

Personnel doors may be 3 feet wide X 7 feet high. Double-leaf doors should generally have an astragal. The maintenance workbay/hangar door size is 28 feet high X 18 feet wide. Workbay/Hangar doors may be constructed of insulated panels or fabric type.

Logistics Maintenance/ Aviation Hangar Doors Steel sliding of vertical lift fabric doors may be used. - UFGS 08 34 16.10/20

Skylights and Clerestories - UFGS 08 62 00

The design A-E should consider a limited amount of skylights in a day-lighting scheme. Where high walls exist, clerestory windows shall be used instead of skylights to provide adequate natural light. Lobbies, warehouses, and interior windowless areas may have skylights.

Door Hardware - UFGS 08 71 00

Door locks should be heavy-duty mortise type, except that doors to rooms containing an arms vault shall have Government Series 86 (ANSI A115.1) dead bolt locks (Federal Specification FF-H-105). Offices and other non-security-type areas should have standard commercial passageway locks. For safety reasons, lock sets and locks normally should not be installed on interior stairways or toilet room doors. The needs for life safety, force protection, and access control should be coordinated in the selection of hardware. In locations where doors potentially can be used as a means of egress for assembly use groups, the design A-E should avoid inadvertently controlling doors in the direction of egress with delayed-release locking devices.

Glazing Types (Blast Resistant Tempered) - UFGS 08 56 53

Generally, windows should be manually operated. Glazed openings susceptible to accidental human impact should be designed in accordance with the applicable IBC, Consumer Product Safety Commission (CPSC), or similar code safety requirements in model building codes. In considering the use of high-performance glazing, the designer should carefully match the solar gain/heat loss values and thermal performance levels including solar gain. Force protection issues must also be considered in the glazing design at locations where exposure to threat is indicated. Such glazing units and restraint systems in insulated units are a significant cost issue. The needs for natural daylight, thermal efficiency, value, and security should be balanced. Security window sash and bars may be used only at ground floor locations of supply and repair parts rooms and warehouses.

DIVISION 09 FINISHES

Basic Interior Finishes

All facility-type design guides include tables for generic interior finishes appropriate for use within each room or space.

Acoustical Ceilings - UFGS 09 51 00

Resilient Flooring - UFGS 09 65 00

Carpet - UFGS 09 68 00

Exterior Painting and Coatings - UFGS 09 90 00

The painting of exterior galvanized metal surfaces (gutters, downspouts, and flashing) is authorized where such surfaces are exposed to view from the ground. All exterior aluminum doors, window frames, and trim may be anodized (clear or bronze). Wood windows, doors, and trim, as well as non-galvanized or unfinished steel windows and doors, may be painted. Baked-on colors are authorized instead of anodized finish on aluminum or steel commercial-grade doors and windows.

DIVISION 10 SPECIALTIES

Bulletin and Tack Boards - UFGS 10 10 00

A standard manufactured bulletin or tackboard with a cork surface laminated to a backing board and a clear anodized aluminum frame (flush mounted) is authorized. The board should be permanently affixed to the wall with vandal-proof fasteners.

Marker Boards - UFGS 10 10 00

A marker board with a standard color, appropriate finish, clear anodized aluminum tray, and frame (flush mounted) may be provided. The board should be permanently affixed to the wall with vandal-proof fasteners.

Exterior Signage (Free-standing or Building Mounted) - UFGS 10 14 01

Building identification signs are authorized for all projects. The sign may be free-standing building mounted or independent letters may be mounted directly on the exterior building surface. It should be located in direct view of the public, facing a main thoroughfare or public street. The facility name letters should be a maximum of 12 in. high, and the State name followed by "ARMY NATIONAL GUARD" should be a maximum of 8-in.-high letters.

Interior Signage - UFGS 10 14 02

Room signs may be made of aluminum or plastic material. Letters or numbers should be no larger than 1 in. in height. Preference should be given to pre-manufactured

systems that have interchangeable components. Signs may be made of aluminum, steel, plastic, or other appropriate materials of equivalent cost.

Toilet Partitions - UFGS 10 21 13

Toilet partitions should be of steel, with a baked enamel finish or plastic laminate, for durability. Partitions should be anchored to solid reinforcement in the walls, and should be supported overhead and secured to the floor (including miscellaneous metal bracing above the ceiling.)

Toilet Accessories - UFGS 10 28 13

Toilet partitions should be of steel, with a baked enamel finish or plastic laminate, for durability. Partitions should be anchored to solid reinforcement in the walls, and should be supported overhead and secured to the floor (including miscellaneous metal bracing above the ceiling.)

Metal Lockers - UFGS 10 51 13

Lockers should be raised on a base above the floor. A full-length wood bench, anchored to the floor, should be placed between each parallel group of lockers. In selecting hardware, the design A-E should coordinate the needs for access control. Lockers should be deep enough, tall enough (single tier), and wide enough for required equipment and clothing to be stored. Lockers are to be secured with padlocks furnished separately.

DIVISION 11 EQUIPMENT

Food Service Equipment Schedule

Refrigerated and Frozen Food Storage Equipment - UFGS 11 41 11

Food Preparation Equipment - UFGS 11 42 00

Food Cooking Equipment - UFGS 11 44 00

Food Dispensing Equipment - UFGS 11 46 00

Ice Machines - UFGS 11 47 00

Cleaning and Disposal Equipment - UFGS 11 48 00

Vaults (Armory)

The area of the vault can be obtained from the approved program documents. Generally, no vaults should be designed with less than 300 square feet of space. Vaults should be designed and constructed in accordance with AR 190-11. Conduit for

the intrusion detection, telephones, and electrical systems should be provided by the design A-E. If a modular vault constructed of precast panels meets or exceeds the security requirements in AR 190-11, it may be bid as an additive alternate to the constructed-in-place vault and the less expensive vault should be selected. A vault should not be placed on an exterior wall.

Vault Wall Construction

Vault walls shall, at a minimum, consist of 8-in.-thick reinforced concrete. The wall will be reinforced with No. 4 reinforcing bars at 9 inches on center in each direction in each face of the wall.. Reinforcement in the 2 faces of the wall will be staggered on each face to form a projected grid approximately 4-1/2 inches square. Reinforcement in the walls will be tied into floors and ceilings in accordance with American Concrete Institute standards. In addition, Anchor rings should be installed along the inside walls to facilitate the securing of arms racks. As an alternate, a 3/8-in.-thick by 2-in.-wide

hardened steel bar located continuously around the inside wall, with anchor rings welded to the bar, may be used to facilitate the securing of arms racks.

Vault Floor Construction

The vault floor should consist of a 6-in. reinforced concrete slab construction reinforced with 6 inches by 6 inches, W4 by W4 welded wire fabric or equivalent steel reinforcing bars (based on area of steel per square foot).. If the floor is the ceiling for a room or area below, the slab shall be a minimum of 8 in. thick. Where equivalent steel reinforcing bars are used, bar spacing will form a grid so that the area of any opening does not exceed 96 square inches.

Doors and door frames.

The vault door threshold must be level with the adjoining floor to allow easy movement of pallet jacks and other wheeled items. The door will be GSA approved Class V armory door per GSA Fed Spec AA-D-600D. Door frames will be per Fed Spec AA-D-600D.

Vault Ceiling

Ceilings and roofs will be of reinforced concrete construction. The thinnest portion may not be less than 6 inches. reinforcing bar spacing will form a grid so that the area of any opening does not exceed 96 square inches using No. 4 bars or larger. If the ceiling is the floor for a room above, the slab should be a minimum of 8 in. thick.

Vault HVAC

The vault should be provided with a (Z-type) vent for emergency ventilation. The design A-E should provide for a minimum of four air changes per hour of supply air from a central HVAC unit into the vault, and the air should exhaust directly to the outside.

The design A-E should also specify a packaged dehumidifier. The dehumidifier condensate floor drain should be located outside of the vault. Canvas-type flexible duct connections should be used to eliminate vibration, and ducts should terminate with security grilles and registers at the interior surfaces. Windows are not authorized. Ducts, vents, and other openings of 96 square inches or more with the least dimension greater than 6 inches will be secured in accordance with 1 of the following methods and otherwise limited to the minimum number and size that are essential

- (1) Sealed with material comparable to that forming the adjacent walls.
- (2) Fitted with any of the barriers below with bars or steel mesh securely embedded in the structure of the building or welded to a steel frame that will be securely attached to the wall with fastenings inaccessible from the exterior of arms storage facility.
 - (a) Three–eighth inch or larger hardened steel bars with vertical bars not more than 4 inches apart and with horizontal bars welded to the vertical bars so that the openings do not exceed 32 square inches.
 - (b) A minimum of 8–gauge high carbon manganese steel mesh with 2–inch diamond grid.
 - (c) A 6–gauge cold drawn steel wire mesh with 2–inch diamond grid when 8–gauge mesh above is not available.

Modular/Portable Arms Vault

Modular/portable arms vaults may be used for service in lieu of concrete constructed in place units where they can be located in a secure environment meeting AR 190-11 and DOD NSWC 3046-93-2 Standards. These pre-engineered vaults must meet all the above requirements of the constructed in place units.

Security Safe

A security safe that is permanently installed (mechanically secured to the floor or wall) may be provided within the vault to store weapon parts and other highly sensitive items.

Loading Docks - UFGS 11 31 10

In addition to the docks authorized for the data and parts vans and trailers, a loading dock should be provided in the receiving and shipping area of the Class IX operation. The dock should be of sufficient length to provide space for a minimum of three trucks simultaneously loading or off-loading supplies. The dock should be 15 ft deep to provide the required space for forklift operations, approximately 4 ft high, and covered with a roof. Each of the truck docking spaces should be equipped with a mechanical self-leveling dock leveler. One of the truck loading and off-loading dock spaces should have an enclosure equipped with an air seal to close the gap between the enclosure

and truck body. If operational requirements make it necessary (that is, if the outside heating design temperature is 15°F or cooler), a heated air curtain should be provided at one or two doors (but not at the door with the enclosure). Rubber, neoprene, or wood dock bumper blocks should be included. Stairs to the dock(s) should be provided as required. The dock(s) should have an access ramp no wider than 10 ft to provide forklift access to the dock. The lighting illumination level on the dock should be 30 FC.

DIVISION 12 FURNISHINGS

Window Blinds - UFGS 12 21 00

Operable blinds or shades may be provided in administrative and shop areas except workbays. Blackout shades and blinds should be installed in any functional areas where training or briefings may occur, including the break and assembly or safety briefing areas.

Furniture Systems (Workstations) - UFGS 12 50 00

This specification establishes the minimum requirements for the acquisition and installation of a complete and usable system of modular workstations, freestanding work surfaces, electrical wiring and communication access requirements. A comprehensive interior design with furniture/equipment layout drawings and cost estimate construction documents must be provided. For complete interior design guidance reference UFC 3-120-10. Design funds for Military Construction Program Planning and Design must be used for all interior design construction documents preparation.

Interior Design and Administration

GENERAL INFORMATION

Interior Design is required on new building construction and renovation projects regardless of funding source or type of project. Planning furniture cannot occur too early for a project. Furniture, fixtures, and equipment should be identified in the programming phase by the designer. Currently the furniture plan is afterthought and is not included in the construction documents.

PURPOSE

A Comprehensive Interior Design (CID) will provide, unless otherwise directed, and includes the Structural Interior Design (SID) and the Furniture, Fixtures, and Equipment (FF & E) Design. The CID provides a formal method for establishing the standard and requirements for all furniture, fixtures, equipment & sometime millwork. The Structural Interior Design includes building related design elements and components generally part of the building itself, such as walls, ceilings, floor coverings, and built in casework. The Furniture, Fixtures, and Equipment is the selection, layout, specification and documentation of workstations, seating, storage, filing, visual display items,

accessories, window treatments, and artwork including contract documentation to facilitate pricing, procurement, and installation. The designer shall refer to UFC 3-120-10 Interior Design and UFC 4-610-10 Administration Facilities for additional information and requirements.

PROFESSIONAL

The primary benefit to employing the Interior Designer directly is having an independent and objective advocate whose only focus is the function and aesthetics of the interior space. The main benefit of having an Interior Designer under contract to the Architect is enhanced communication and closer project coordination. In either case, the Interior Designer will have direct communication and coordination with both parties.

The Interior Designer's scope of services may include space planning; development of the furniture program and budget; design of custom millwork & furniture; selections of interior finish material and design motif; interior signage design and specification and specification of furniture and shelving. It should include several meetings to discuss functions of the interior spaces and furniture requirements. The layouts, selections of specific items, and presentation boards of colors and finish materials should be presented to the client as the phases are completed.

PROCUREMENT

Refer to UFC 3-120-10 Interior Design for procurement methods for the CID.

TIMELINE

During the programming phase, FF& E should be included. With early input, the space planner can accommodate the required furniture. It can also assure that a realistic budget is developed. Begin with a list all furniture items to be place in the facilities, included preferred dimensions, quantity, equipment to be housed and any electrical and data requirements. Existing furniture reused should be listed as refurbish. Below is an example of a spreadsheet that would assist in the preliminary furniture list may be used.

ITEM	ITEM NAME	#	LOCATION	EX/NEW	DESCRIPTION	FINISH	NOTES
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During the design phase, selection of furniture and budget should be done. Specification and drawings should be included in the construction document phase. The electrical and data coordination are also required early in the project.

PERFORMANCE STANDARD

There are many points to consider when selecting furniture, functionality and durability are the primary. Performance standards should be reviewed prior to making any furniture decision. The Business and Institutional Furniture Manufacturer's Association (BIFMA) provides a listing of available standards. It currently lists the American

National Standard for Office Furnishings (ANSI) standards for the following products: General Purpose Office Chairs, Lateral Files, Vertical Files, Desk Products, Panel Systems, and the BIFMA Ergonomics Guideline for VDT (Visual Display Terminal) Furniture.

BUDGET

Cost Engineering (CE) will be an integral part of the design process. Apply the CE principles and practices in the pre-design and programming development stage relative to establishing costs. Initiate more CE cost relative to the scope and requirements at the concept design on program documents and use throughout the design and construction of projects. Based design decisions on life-cycle cost considerations to determine an economical design for facilities. Take into account not only the initial construction costs but also the operating and maintenance costs of buildings, the associated impacts on productivity and missions performed within the facility over their anticipated life. Designers must design within current cost criteria and requirements of each project's programming documents and Form DD 1391. Once the furniture itemized list and FF& E plan have been prepared, a preliminary budget can be estimated. It is important to use realistic costs rather than general cost per square foot. Allowances should include freight, delivery, installation relocation and sales tax. Contingency amount is for unforeseen items and unanticipated price increase. Allowances and contingency should be included in the budget. The budget should be updated often as the CID is updated. Life-Cycle Costing is a sometime factor in the budget and specifying furniture. It includes elements other than acquisition cost to determine the actual cost over time. The initial cost includes discounts, shipping, delivery, handling assembly, storage, installation, personnel, training, etc. Other elements to consider about the initial cost are service life of product; recurring operational costs and maintenance cost. Life Cycle Costing adds another dimension to the budgeting process and provides additional quality control by analyzing the cost of the product over its lifespan, with the added potential for operational and maintenance cost savings.

CRITERIA

Besides the functionality and cost, appropriateness to the over-all design concept is one of the first criteria used in selecting furniture finish materials. Careful attention should be paid to matching materials and stain colors and sample submittals for all products should be examined and compared. Durability and longevity is another important criterion in selecting materials. If a material won't stand up to heavy use and wear or can't be easily repaired, then it probably shouldn't be used. To minimize static electricity generation in sensitive computer areas, wood or other nonconductive materials should be used rather than plastic coated or metal furniture. Vinyl upholstery can also contribute to the problem. Wool or wool nylon blends would be a better choice. Ergonomically should be taken into consideration. It is designed to adjust to the user's body such as the mechanisms ranging from simple seat height to multitude of adjustments.

MAINTENANCE ISSUES

All furniture materials must be maintained. Maintenance instructions should be requested from each manufacturer and kept together for reference. Often the life of a material is determined by the care it receives. Correct cleaning procedures will help preserve the furniture. Follow cleaning instruction and maintenance instruction per the manufacturer.

DIVISION 13 SPECIAL CONSTRUCTION

A. Intrusion Detection System (IDS) General Information

The Electronic Security Program Office (ARNG-ILI-F) has selected three (3) IDS for protection of Federal assets and arms, ammunitions, and explosives (Ademco Vista 128 Panel; FBI XL4 Panel; IST/EUROPLEX 2064NG Panel). IDS shall be installed in each facility containing an arms and/or ammunition vault. The system shall consist of a Commercial IDS furnished by the Federal government and installed by the contractor or State. The IDS shall include the following:

Vault Pre-Entry Area

The space providing access to a vault should have the following:

- One ultrasonic motion sensor directed at the vault door
- An ultrasonic motion processor
- Balanced magnetic switches on all doors and operable windows
- A time delay device with timer and duress capability

Arms Vault Protection/Commercial IDS

The arms vaults should have the following controls and related equipment:

- A balanced magnetic switch on the door
- Passive ultrasonic sensors throughout (vibration sensors where ultrasonic noise levels prevent the use of passive ultrasonic sensors)
- A passive ultrasonic processor
- A data transmission system located in the control unit connected to a dedicated telephone line for monitoring

B Pre-Engineered Structures - UFGS 13 34 19

Pre-engineered structures may be used for the following if they meet functional requirements:

- Controlled waste-handling facility
- Covered (enclosed), unheated vehicle and parts storage
- Covered storage areas

If required, shelving and access metal ramps affixed to the structure may be purchased as part of the unit. These structures are to be attached to a concrete slab, and the electrical power line is to be hardwired to the electrical control panel of the structure. The same electrical and mechanical service requirements need to be met as in conventional construction.

C Sensitive Compartmented Information Facility (SCIF).

Ref: UNIFIED FACILITIES CRITERIA (UFC) 4-021-02NF. Security Engineering: Design of Electronic Security Systems (ESS). ESS is the integrated electronic system that encompasses the Access Control Systems (ACS), interior and exterior Intrusion Detection System (IDS), Closed Circuit Television Systems (CCTV systems) for assessment of alarm conditions, the Data Transmission Media (DTM), alarm reporting systems for monitor, control, and display, and the policies, procedures, and response times that ensure that all elements of the ESS work effectively.

SCIF can be an enclosed area within a building (a room), a trailer enclosed in special panels to prevent information from leaking and where jamming is used to prevent surveillance or a facility capable of storing Sensitive Compartmented Information (SCI) materials. Requirements for these facilities are defined in Intelligence Community Directive (ICD) 705 or latest and Intelligence Community Standard (ICS) 705.1 – Guidance on SCIF Construction.

Design Considerations and Guidance

1. Introduction

- All new and renovated SCIFs in the ARNG must be designed to the requirements of UFC 4-021-02NF and 705.1 – Guidance on SCIF Construction.. The design will be sent to ARNG-ILI before construction for review and approval..

2 Entries and Exits

SCIFs are limited to only one entrance unless approved by the Cognizant Security Authority. Use of external door hardware is prohibited on SCIFs (with the exception of the SCIF entrance)..
Per DoD Directive 8190.3, the CAC should be “the principal card enabling

- physical access to SCIFs. Other supplementary security systems (such as badging systems) that are considered necessary to provide an additional level of security not presently afforded by the CAC may be used.
3. **INTRUSION DETECTION SYSTEM (IDS).** Reference: Chapter 5 of UFC 4-021-02NF. The principal elements of an IDS include interior sensors, exterior sensors, Central Processing Unit (CPU) or local controllers, communications and interfaces with ACS, CCTV and the Dispatch Center. Do not use dual-tech devices in SCIFs. Dual-technology sensors can only be used in a SCIF, vault, or secure room if the technologies operate in an “OR” configuration (either the microwave or PIR sense an intruder). Therefore dual technology sensors are not recommended for this application.
 4. **PCU - SCIFs must have a PCU installed** Per the DCID 6/9 definition a PCU is a (CPU). See Figure 3 on Page 132, at the end of this document. A PCU receives signals from all associated sensors in the SCIF’s alarmed zone and establishes the alarm status. The alarm status is immediately transmitted to the monitoring station within the monitoring station, a dedicated alarm-monitoring panel (or central processor) monitors incoming PCU signals. On receiving an alarm signal, a monitoring station’s enunciator generates an audible or visual alarm for the monitoring personnel
 5. **CCTV Installation** CCTV cameras should not be installed in areas that may compromise classified material (such as SCIFs).
 6. The computer running within this facility must operate under rules set forth in ICD 503. Computer and telecommunication equipment within must fall within the TEMPEST emanations specification as directed by a Certified TEMPEST Technical Authority (CTTA).
 7. **Backup Power Battery Backup -** The minimum requirement for battery backup for an IDS and its monitoring station is eight hours. If primary power is subject to being out for longer periods, increase backup capacity accordingly. The requirement for battery backup for a SCIF and its monitoring station is 24 hours. The battery backup requirement for a SCIF can be reduced if the system is on a generator. Monitoring stations must have visible and audible indicators to inform system operators of failure of a power source, a change in power source, and the location of the failure or change. Any metallic conduit that leaves an area that processes classified information such as a SCIF must be decoupled (insert of nonmetallic conduit) when existing the area.

SECTION 5 MECHANICAL AND PLUMBING SYSTEMS DESIGN

DIVISION 14 CONVEYING SYSTEMS

Hydraulic Elevators - UFGS-14 24 00

The majority of ARNG facilities are not more than three stories in height; therefore, hydraulic elevators should be used in compliance with TI 810-90

DIVISION 21: FIRE SUPPRESSION

Fire Protection Systems - UFGS 21 13 00

An automatic sprinkler system with a fire alarm signaling system should be designed and installed. The system shall meet the requirements of the IBC, UFC 3-600-01 Fire Protection Engineering for Facilities and NFPA 13 and NFPA 72 of the National Fire Codes. Buildings must be of noncombustible construction meeting IBC or Uniform Building Code (UBC) Type I and II. Regardless of the construction type, any facility meeting any of the following criteria should be provided with an appropriate fire protection system:

- The area exceeds 15,000 ft².
- Operational impairment would reduce the operational readiness and responsiveness of the strategic or tactical defensive and offensive capability.
- The contents include direct war-fighting assets (combat aircraft or tactical vehicles).
- The facility and contents housing critical equipment requiring a long lead time to replace that have a high monetary value with a replacement cost or value exceeding \$5.0 million.

Fire Protection System (AFFF) - UFGS 21 13 24

Aqueous Film-Forming Foam should be used for Army Aviation Support Facilities helicopter maintenance hangars.

Wet Pipe Sprinkler System - UFGS 21 13 13.00

Dry Pipe Sprinkler System - UFGS 21 13 17.00

Foam Fire Extinguishing for Aviation Facility - UFGS 21 13 20.00

Foam Fire Extinguishing for Haz/Flam Materials - UFGS 21 13 22.00

DIVISION 22 PLUMBING SYSTEMS

System Sizing

Plumbing systems should be designed and installed in accordance with the International Plumbing Code, American Society of Plumbing Engineers (ASPE) Data Book and the State/Local Plumbing Codes.

Piping Insulation - UFGS 22 07 19

Heating, cooling, and plumbing piping should be insulated in accordance with ASHRAE Standard 90.1-2007 or the State Energy Code. Waste and drainage piping should be

insulated with a sealed vapor barrier where condensation may occur. Insulation type should be as indicated in related ASTM standards. Insulation application should be in accordance with MICA Standards.

Piping Systems Support - UFGS 22 05-48

The materials for piping supports should be in accordance with Manufacturers Standardization Society (MSS) SP-58, SP-69, and SP-89. The design A-E should provide a pipe flow diagram showing all sizes, flow rates, valves, coils, vessels, and pumps. Typical piping details for coils, vessels, and pumps should be part of the contract drawings to support the test and balance contractor and maintenance staff.

Pipe Labeling

Piping systems should be labeled for identification purposes. Where painting is authorized, the pipe exposed to view may be painted to match adjacent surfaces. Piping should be labeled to indicate the fluid and direction of flow.

Piping Specialties - UFGS 22 00 00

The following should be provided:

- Thermometers at the inlet and outlet of hot water boilers, heat exchangers, and major AHU coils
- Thermometers at the outlet of domestic water heaters
- Pressure gauges at the inlet and outlet of HVAC pumps and at hydronic system water makeup points
- Strainers at the inlet of pumps

Domestic Water Piping - UFGS 22 00 00

Domestic water piping should be insulated Type M copper for hot and cold service, with heat-free solder.

Sanitary Waste and Vent Piping - UFGS 22 00 00

Sanitary waste lines for above-grade and venting service should be cast iron soil pipe Schedule 40 PVC or copper alloy drain, waste, or vent (DWV) tubing. All below-grade sanitary waste lines under the building should be cast iron soil pipe.

Storm Drainage Piping - UFGS 22 00 00

Storm drain pipes shall be Schedule 40 PVC for conductors and cast iron soil pipe for below-grade service. Interior roof drains discharging onto grade are authorized for large roof areas but must be coordinated with the civil storm drains and regulations. Interior roof drains discharging into underground piping systems are authorized in areas where the heating design temperature, as determined from the 97.5 percent column in UFC-3-400-02, is (+) 10°F dry bulb or less. Federal support is also authorized for the underground piping system in these areas. The design A-E should provide roof relief scuppers in accordance with the plumbing code where parapets surround the drainage area.

Fuel Piping - UFGS 22 00 00

Gas and fuel oil piping should be Schedule 40 black steel or Type L copper tubing. (Steel fuel oil piping should have welded joints.) Fuel-dispensing output capacity should not exceed 26 gpm. Special approval is needed for high-speed, large-capacity units involving multiple dispensing systems and a pump located in the tank.

Plumbing Fixtures - UFGS 22 00 00

Water closets should have self-closing valves, flushometers, and low-flow-type fittings for water conservation. The number provided should be based on the International Plumbing Code (IPC) or the State plumbing code, whichever is most stringent. Floor-mounted or wall-hung tank-type fixtures of vitreous china shall be specified where water pressure is a factor. Flush valve fixtures may be used where the required water pressure is available.

Lavatories - UFGS 22 00 00

Countertop lavatories should be provided in female toilet rooms, and either countertop or wall-hung units should be provided in male toilet rooms.

Showers - UFGS 22 00 00

The amount of showers should meet the requirements of the IPC, the State code, or NG PAM 415-12, whichever is more stringent.

Mop Sink - UFGS 22 00 00

Each occupied building should have a minimum of one janitorial closet with a mop sink per floor.

Water Coolers UFGS 22 00 00

Water cooler drinking fountains are authorized in barracks, educational facilities, medical clinics, dining facilities, training site headquarters, all unit headquarters buildings, and any other location where required by an applicable code. They should not be recessed unless they would cause a safety hazard or unless recessing is required to meet Federal, State, and/or local codes.

Eye Wash and Deluge Shower - UFGS 22 00 00

An eye wash and deluge shower, equipped with an audible alarm that is activated when they are operated, should be installed in any area where personnel could be accidentally exposed to harmful wastes in accordance with ANSI Standard Z358.1-2004. The alarm should be located where workers outside of the immediate area can hear it and respond. The location of the eye wash and deluge shower should allow easy access from any point in the facility (10 second walk). Floor drains are not recommended. Tempered water is required to be between 70-95 degrees F.

Exterior Wall Hydrants - UFGS 22 00 00

Freezeless anti-siphon wall hydrants should be provided no closer than 100 ft apart on the exterior walls of a building.

Hot Water Heaters - UFGS 22 00 00

Separate point-of-use water heaters, instead of circulating pumps and piping, may be provided for remotely located toilet areas.

DIVISION 23 HEATING, VENTILATING, AIR CONDITIONING

General Information

Mechanical systems should be designed in accordance with the latest recommendations of ASHRAE Handbooks and Standards and the ACGIH Industrial Ventilation Manual. Ductwork for heating, cooling, and exhaust should generally be overhead instead of underground, and should be minimized to the shortest runs possible. All ductwork should be of sheet metal, and designed and constructed in accordance with handbooks and standards by ASHRAE and the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).

HVAC System Sizing

The system components should be selected to maintain an inside winter design temperature of 68 °F during the heating season except in storage rooms, maintenance training work bays, and the weapons vault, where the design temperature should be 55 °F. Summer inside Design Temperatures should be 78 degrees F and 50% RH maximum and 30% RH minimum. To the greatest extent possible, the areas designated

for part-time occupancy should be on separate zones from those having full-time occupancy. Exterior design conditions must be in accordance with UFC-3-400-02, Engineer Weather Data and ASHRAE Handbook of Fundamentals.

Seismic Bracing - UFGS 23 05 48

In all regions where the building design must comply with seismic force resistance, the design A-E should provide bracing and anchoring of interior and exterior mechanical piping and equipment for protection from damage. Bracing and anchoring should be designed and installed in accordance with UFC 3-310-03A, Seismic Design for Buildings and ASHRAE Application Handbook.

Ductwork Insulation - UFGS 23 07 00

All heating and cooling system supply and return air ductwork should be externally insulated following the latest recommendations of the Midwest Insulation Contractors Association (MICA) National Commercial & Industrial Insulation Standards and ASHRAE Standard 90.1-2007. Internal insulation should be used only on exhaust ducts. Return and exhaust ducts do not require insulation within conditioned areas. Direct lining should not be used in supply ducts.

Heating Systems - UFGS 23 54 19

An LCCA must be performed. It should address the initial construction cost and annual operating and maintenance cost, calculated in discounted dollars, for each proposed system. The analysis should clearly indicate which system has been selected, and if it is not the lowest-cost option, a justification should be presented.

Heat Pumps Water/Ground Source - UFGS 23 81 47

Water source heat pumps may be used if justified by the LCCA. Heat pumps provide efficient operation, especially where electric resistance heating is the only other viable option. Heat pumps permit zoned temperature control and allow temperature to be set back on a room-by-room basis when spaces are unoccupied.

Infrared Radiant Heaters - UFGS 23 54 16

Infrared radiant heaters using oil or natural gas for fuel may be used for vehicle workbays and for shipping and receiving areas of warehouses.

.....Energy Sources

The selection of the energy source for the heating system is part of the LCCA process which establishes the most cost-effective alternative available in accordance with the provisions of AR 420-49. The viable alternatives include:

- Fuel oil
- Natural gas
- LPG
- Electricity
- Solar
- Geothermal

If fuel oil is the primary source, an above-ground storage tank or an underground storage tank (with double-wall containment and monitoring wells) may be installed. If natural gas is the primary fuel, the boiler may be equipped with dual fuel burners and an interior pipe line to the exterior building wall (but not a storage tank) to facilitate possible future conversion to the use of fuel oil as the energy source availability and economics dictate.

Pollution Control - UFGS 23 51 43

Heating systems are subject to Federal, State, and local air pollution control regulations. Generally, heating systems are regulated based on the fuel source and design heat input in British thermal units (Btu) per hour. If the heat input exceeds a regulated limit, an air permit may be required for construction.

Boilers Heating Systems - UFGS 23 52 00

If a boiler is chosen as the most economical system, a hot water unit is more economical to operate than a steam unit. Boilers may use coal, natural gas, or oil, to be determined based on the appropriate fuel selection procedures. Two heating boilers may be selected, provided that the output capacity of each boiler would not exceed two-thirds of the design heating load. Hot water heating systems generally are economical in cold weather climates and should not be considered for warmer climates unless an LCCA proves them to be the most cost effective. Chemical treatment of water should be used where analysis indicates it is necessary.

Mechanical/Industrial Ventilation Systems - UFGS 23 35 19

Mechanical ventilation systems for summer operation of non-air-conditioned areas should provide a minimum of four air changes per hour. The minimum air changes per hour for interior heat control should be based on the internal heat gain. The minimum air change per hour for dilution ventilation and exhaust should be as recommended by the ASHRAE handbooks, the ACGIH Industrial Ventilation Manual, and OSHA Standards for General Industry. Special exhaust systems are required as identified in

each facility-type design guide. Mechanical ventilation should be provided in all climates during the summer and winter seasons.

Air Conditioning Systems and Evaporative Cooling

Mechanical air conditioning or evaporative cooling for personnel comfort shall be in accordance with AR 420-49, Chapter 7, Air Conditioning and Refrigeration. Spaces to be air conditioned should be consolidated to the maximum extent feasible and efficiently zoned within the system design. Central station air handling or packaged units with 35% efficiency filter banks should be used to the maximum extent possible. Independent units of the appropriate size should serve small, remotely located spaces. HVAC equipment should be located in indoor mechanical equipment rooms wherever possible to facilitate maintenance and extend equipment life.

System Sizing HVAC

The system components should be sized to maintain a summer indoor design temperature of 78 °F with a maximum RH of 50 percent and a winter indoor design temperature of 68 °F and 35% RH based on an outside design temperature as designated in ASHRAE Fundamental Handbook and UFC-3-400-02 Design Engineering Weather Data for the project location.

Desiccant Dehumidification Equipment - UFGS 23 84 16

Energy Recovery Systems - UFGS 23 72 00

Filters-HVAC Systems - UFGS 23 41 13

System Controls - Direct Digital - UFGS 23 09 23

A system of direct digital controls should be used to maintain the interior temperature at the design level during periods of occupancy and at lower temperatures (40 to 50 °F) as appropriate when unoccupied. Pneumatically operated systems may be used as an extension of an existing system.

DIVISION 25 INTEGRATED AUTOMATION

Energy Management & Control System - UFGS 2510 10

Utility monitoring and control systems should be used to conserve energy by providing a capability to preset the appropriate temperature levels for unoccupied periods. An outdoor temperature-sensing control located near the mechanical room should be provided to automatically shut off the heating system when the outdoor temperature reaches or exceeds 65 °F for more than 24 hours. The outdoor temperature-sensing control should have a convenient manual override.

SECTION 6 ELECTRICAL AND COMMUNICATION SYSTEMS DESIGN

The electrical and communication systems design should consist of safe and economical power distribution, lighting, communication, and fire alarm and signaling systems meeting present requirements and anticipated future growth. The design should meet requirements of NFPA, applicable codes, and Unified Facilities Criteria.

DIVISION 26 ELECTRICAL

General Information

Exterior Electrical Design

Direct burial cable marked with above-ground indicators at appropriate intervals should be used to the maximum practical extent. Conduit should be limited to those sections passing under paved areas unless the local electric company policy is to install all underground service in conduit. Lighting and power loads should be served at the highest voltage practicable. The design A-E should specify primary power at three-phase, 480Y/277 volts and use a dry-type transformer to obtain 208Y/120 volts where required.

Service Line

The secondary power supply line should be sized adequately to accommodate any future projected demand. The electrical power to such items as fuel-dispensing systems and lubrication and inspection racks is included under this item. Extension of the primary power supply line, substations, and transformers should be the financial responsibility of the locality or State, except when a proposed building is located on Federal property. **Generators must be provided for Readiness Centers, Aviation Support Facilities, USPFO/Warehouse, Barracks and Dining Facilities.** The designer must provide the necessary auxiliary equipment.

- A quick power disconnect
- An automatic transfer switch (manual w/o generator provided)
- Fuel oil and diesel piping from the storage tank
- An 8-ft by 16-ft by 6-in. reinforced concrete pad near the main power service

Interior Electrical Design

The design for the electrical systems should include provisions for safe and economical electrical distribution, lighting, communications, and signaling systems that meet present requirements and anticipated future growth. The electrical power distribution system should be designed to meet all requirements of UFC 3-520-01 and NFPA 70.

Seismic Bracing

The design A-E should provide bracing and anchoring of electrical conduit, cable trays, and equipment to protect them from damage due to seismic forces where the regional requirements dictate. Refer to UFC 3-310-03A, Seismic Design for Buildings and the International Building Code for guidelines regarding seismic bracing requirements.

Wiring – UFGS 26 05 19

Wiring (including conduit for future communications), junction boxes, and plug-in receptacles may be selected for use in a grid arrangement above the suspended ceilings in large open administrative areas. This is to be used in conjunction with "telephone power pole" systems or conventional wall and/or floor pedestal outlets. Wiring and conduit may be labeled or tagged for circuit identification but should not be painted. Electrical metallic tubing or rigid conduit should be used where required by code. The administrative areas, corridors, lobby, toilets, classrooms and library, learning center, food preparation and scullery area, and physical fitness area should have concealed conduit, which may also be used throughout the facility.

To reduce overheating of the neutral conductor due to harmonic currents caused by switch mode power supplies in computer equipment, the neutral of multi-wire branch circuits should be sized at 175 percent of the phase conductors. The oversized neutral will occur at multi-wire branch circuits, which may have computer equipment connected. Using the oversized neutral has two benefits over separate circuits: 1) reduced cost because of decreased wire and conduit quantities; 2) reduced voltage drop because a three-phase voltage drop is less than a single-phase voltage drop and the oversized neutral has less voltage than the code minimum neutral.

Electrical Receptacles

Electrical receptacles should be provided in accordance with tables included in the appendices of each facility-type design guide. Emergency power receptacles shall be red in color.

Electrical Power

The interior electrical system should be designed for the most efficient and economical distribution of power, using the highest voltage consistent with the load served. A three-phase, 208Y/120-volt system should generally be the minimum, with consideration given to the use of a 480Y/277-volt system where loads are sufficient to justify it.

Primary Electrical Service

Primary electric service shall be provided underground from the nearest pole to pad-mounted, three-phase transformers located near the exterior of the mechanical equipment room or load center.

Secondary Electrical Service

Secondary electric service from transformers to the building shall also be underground. If metering is required, the electric meter should be placed on the secondary service side rather than the primary service side. Digital Meters should be provided to each building.

Emergency Generators/Automatic Transfer Switch - UFGS 26 32 15/26 28 21

Generators should be placed away from areas averse to noise and fumes, to include fresh air intake louvers. Reference NFPA 110, Standard for Emergency and Standby Power Systems. An Emergency Power Generator and Automatic Transfer Switch must be provided for every Readiness Center, Army Aviation Support Facility, Barracks, Dining Facility and USPFO/Warehouse.

Ground Fault Protection

Ground fault provisions should be in accordance with NFPA 70. Ground fault protection may be used for all receptacles where power tools will be used.

Service Distribution

Service and distribution equipment exceeding 600 volts should be metal enclosed and manually operated, with fusible load-interrupter switches or power circuit breakers. Low-voltage services should have power circuit breakers or fusible disconnect switches.

Interior Distribution - UFGS 26 20 00

The electrical system design should include the most efficient and economical distribution of power, using the highest voltage consistent with the loads served. A three-phase, 208Y/120-volt system is generally the minimum, with consideration given to the use of a 480Y/277-volt system where loads are sufficient to justify it.

Lightning and Surge Protection UFGS 26 41 00 n

The design A-E should specify a lightning protection system for any building located in an area with a high lightning probability using the risk assessment calculation specified in *NFPA 780, Standard for the Installation of Lightning Protection Systems, Appendix H*. Power line surge protection equipment should be specified at the main service panel, mid-building panel, and any dedicated electronic or computer equipment service panel.

Power Panels - UFGS 26 24 16

Power panels, telecommunications equipment, and electrical equipment should be located in secure areas free from environmental extremes of temperature, dust, and humidity. Power panels may not be placed in storage rooms or janitor closets.

Interior Lighting Systems - UFGS 26 51 00

The lighting system design objectives are to economically provide lighting levels for efficient working conditions and effective nighttime vision for security and safety. The lighting system should be designed according to the Illuminating Engineering Society of North America (IESNA) Lighting Handbook and NFPA 70 National Electric Code.

Interior Fixture Types - UFGS 26 51 00

Except in high bay maintenance and classified areas, standard energy-efficient fluorescent light fixtures should be used. Fluorescent lighting may be used in high bay maintenance areas to supplement the metal halide lamps. Parabolic louver fixtures or indirect lighting should be provided in room areas with computer or monitor screens. The design A-E should take the maintenance and inventory cost of lamps and ballasts into consideration when selecting fixture types. T-8 fluorescent lamps and high-efficiency electronic ballasts should be used to achieve a 0.85 Watts/SF lighting power density.

Interior Lighting Intensity Level - UFGS 26 51 00

Lighting levels should conform to the foot-candle levels established for the individual functional areas as specified in the facility-type design guides. If required, portable lighting equipment purchased through standard supply channels should provide special supplementary localized lighting of higher intensity. All interior lighting should be designed in accordance with ANSI/ASHRAE/IESNA Standard 90.1-2007.

Exterior Lighting Systems - UFGS 26 56 00

Lighting should be provided on site at the following locations:

- At entrances to the site and building(s)
- Along sidewalks from parking areas to building entrances
- At military vehicle and POV parking
- Around the entire building perimeter
- At other areas as required for safety and security

- At flag poles

Lighting fixture types should be selected and placed to minimize intensity off site. The lighting for military vehicle parking should illuminate 30 to 40 ft of the area outside the fenced area where M-1 tanks are stored, if that area is within the facility property line.

Exterior Fixture Types - U FGS 26 56 00

High-pressure sodium vapor or metal halide vandal-resistant lenses should be specified. When motion detectors are used in conjunction with security lighting, lights should have the capability to activate instantly. After movement within the area discontinues, the lights should remain on for 15 minutes.

Exterior Lighting Intensity Level - UFGS 26 56 00

A minimum illumination intensity of 0.50 FC should be provided over the entire site. Existing street lighting should be taken into account in the design computations. The design A-E should make sure that the entire exterior of the facility is adequately illuminated for safety and security without undue glare falling on neighboring properties or landing aircraft. Lighting of fuel-dispensing facilities is authorized at an intensity of 20 FC at 3 to 4 ft above finished grade.

Explosion-Proof Fixtures

Lighting fixtures and electrical service located in classified areas (Class I, Division 1 and 2) should be designed and constructed to meet the requirements of the National Electrical Code (NEC), Article 500.

Emergency Egress Lighting - UFGS 26 52 00.00 40

Dual-purpose fluorescent fixtures with internal battery backup at appropriate locations including corridors, hallways, stairs, and fire exit egress should be considered as an alternative to dedicated emergency battery units (EBUs). Such fixtures generally would be the most economical alternative and would not require any special circuitry. Dual-purpose fixtures incorporate battery backup units and continue to function during power outages. If only EBUs are used, they shall be hardwired rather than the plug-in type.

Exit Signs - UFGS 26 53 00

Either illuminated or non-illuminated exit signs should be provided in accordance with applicable codes. Exit signs shall be the light-emitting diode (LED) type.

Lighting for Infrared Scanning

Designated lighting should be equipped with a sensor that illuminates the fixture(s) when the infrared scanning device detects motion. The lighting system may be equipped with an override switch that activates all perimeter lights on demand.

DIVISION 27 COMMUNICATIONS

Communication Systems

Conduit and cable should be provided for all components determined by the State DOIM.

Telecommunications and Cable Requirements

At the programming stage of the project, the CFMO should coordinate with the State Director of Information Management (DOIM) to determine the entire telephone and data communications system to be installed. Telecommunications cabling includes voice, video, and data in a single integrated plant. The cabling should be installed in accordance with *Interim Guidance from U S Army Information Systems Engineering Command, Technical Guide for Installation Information Infrastructure Architecture Technical Guide for 13A, UFC 3-580-01 Telecommunications Building Cabling Systems Planning and Design*; and the Telecommunications Industry Association (TIA)/Electronic Industries Alliance (EIA) 568A and 569-A Standard. Service at the facility should consist of a buried cable with sufficient pairs of wires to accommodate present and future requirements. In the construction drawings and specifications, the design A-E should specify the following as “contractor furnished and installed”:

- The system's outside trenching, plastic conduit, and cable to the terminal board, which is located in or near the mechanical or electrical room
- The cable trays
- Outlet boxes
- Wiring, including associated fittings, connectors, terminal strips, and similar devices needed to install the cable
- The cabinet mounting board

Fiber Optic Cable - UFGS 27 21 10

The DOIM should consider a fiber optic outside cable even though the telephone company's primary cable is not a fiber optic cable. The fiber optic cable would still allow for connection to a conventional telephone system inside the building.

Telephone Outlets

A maximum of one CAT- 6 telephone outlet should be provided at each of the following locations:

- Independent offices
- Approximately 70 ft² of open administrative area
- Each supply and repair area
- Outside the vault door to facilitate Commercial IDS testing
- Technical library, Classrooms and Training Areas
- Lobby (public telephone)

Power for Microprocessors

As long as an adequate number of electrical outlets are provided in areas where microprocessors are to be used, and the circuitry is properly designed to accommodate the anticipated loading, there should be no need for special dedicated circuit wiring for computer use. An exception is the Read Clear All Scalars (RCAS) server and printer location.

Antenna Base and Lead-In

Where one or more of the functional areas at the facility are authorized, a ground-mounted antenna system (either through the terrestrial directional antenna or other sources) with a concrete base and a conduit (with pull wire) leading into the building should be provided. If an antenna mast is roof mounted, a roof-mounted base, mounting brackets, guy cable tie-down, and conduit may be provided as part of the construction. Detailed coordination between the design A-E, the Military Department, and the user are necessary to identify the exact requirements.

Public Address System - FGS 27 51 16

Conduit, wiring, and equipment may be installed for the public address system as part of program requirements. This system should be audible throughout the buildings of the complex and at a reasonable distance outside in order to contact personnel whose exact location is not known. Generally, the unstaffed outbuildings do not require this system; if they do, NGB-ARI requires an approved justification.

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

Carbon Monoxide Detectors - UFGS 28 31 49

Carbon monoxide detectors must be placed in all vehicle and aircraft maintenance Work Bays to create an alarm condition to activate second stage exhaust/ventilation system.

Fire Alarm/Detection and Mass Notification System -UFGS 28 31 76

An automatic fire alarm and detection system must be designed and installed in accordance with NFPA-72 and UFC 3-600-01, with a connection to the supporting fire-fighting unit. However, combined smoke and heat detectors (UL approved, with both smoke- and heat-detecting capability) should be installed in all billeting areas, including corridors. The smoke-detecting component should sound a local alarm confined to the fire-affected room(s), while the heat-detecting component should be connected to the building alarm system. Detectors should be spaced at not more than 30 ft on center and 15 ft maximum between a door and a detector. A Mass Notification System is required in any inhabited facility in conjunction to the Fire Alarm and Detection System. The system must be UL listed and Factory Mutual approved for the intended use.

SECTION 7 UTILITIES FUEL STORAGE

DIVISION 33 UTILITIES

Above-Ground Storage Tanks - UFGS 33 56 10

Above-ground storage tanks may be either single-walled steel or doubled-walled fiberglass-reinforced plastic. The tanks should be designed and installed in accordance with the American Petroleum Institute standards and NFPA 30, Section 2. If it is possible for the liquid contents to flow onto adjacent property or into a public waterway, tanks exceeding 500 gallons in size should be surrounded by a liquid-tight dike equipped with a drain sump, drain pipe, locked-type gate valve, and minimum of two tank grounds. All vegetation should be cleared from within the dike area. The dike area may be made liquid tight by lining the dike with neoprene, rubber, clay (such as bentonite), concrete, or some other impermeable material, whichever is cost effective.

Underground Storage Tanks - UFGS 33 56 10

Underground storage tanks (USTs) (with a concrete hold-down pad and anchor straps, if required by wet soil conditions) shall be designed and installed in accordance with 40 CFR Parts 280 and 281; NFPA 30, Section 2; and/or State and local codes, whichever is more stringent. The USTs should be double-wall construction of either steel or fiberglass reinforced plastic, whichever is the least costly. (The steel tank is the standard; the fiberglass tank may be bid as an additive alternate.) Steel tanks should be coated with either a coal tar or epoxy and should be cathodically protected or coated with glass fiber-reinforced polyester resin. The USTs should be monitored between the

outer and inner shells by means of a leak detection system with an audible alarm and indicator lights.

Underground piping should be of steel or nonmetallic materials. Steel piping shall be cathodically protected. Steel piping and fittings should be primed and protected with pressure-sensitive organic plastic tape or coated with the same material as used to coat the tank. Double-wall piping may be used.

Fuel Storage Tanks (Compresses Gases) - UFGS 33 56 10

When fuel oil or liquefied petroleum gas (LPG) is selected, a 30-day supply is authorized for the capacity of the storage tank. Fuel storage facilities shall conform to all applicable Federal, State, and local vapor emission and water pollution control (spill planning) regulations. Either above- or underground fuel tanks are authorized.

SECTION 8 MATERIAL HANDLING

DIVISION 41 MATERIAL PROCESSING AND HANDLING EQUIPMENT

Top-Running Overhead Cranes - UFGS 41 22 13.14

(Reference DG-415-2 and DG 415-3 requirements)

CHAPTER 7
SUPPLEMENTAL SUBMISSION REQUIREMENTS
(To be determined and developed As Required)

CHAPTER 8

FUNCTIONAL QUALITY ASSURANCE

8-1 MILESTONE COMPLIANCE ASSURANCE

To verify that all functional and performance goals are being accomplished in the project development process, the design review directives checklists in **Appendix C, TABLE 6-1** should be used in the review exercise performed at the 10 percent, 35 percent, and 95 percent design and documentation submission milestones for each facility type (refer to the facility-type design guide for additional, unique design review directives). These reviews are not intended to be an all-inclusive technical analysis related to design criteria. That responsibility belongs to the State and should be accomplished prior to submission of the documents to NGB-ARI at the milestones. The main focus of the NGB-ARI review shall be on effective incorporation of functional requirements that are both general and unique to the different types of facilities.

8-2 DESIGN REVIEW DIRECTIVES FORMAT

The design review directives are arranged to address the following:

- General project coordination issues
- General issues pertaining to each discipline
- Specific functional issues pertaining to each discipline

Many of the checklist items refer directly to the related technical guidance information in Chapter 6, Common Architecture and Engineering Technical Guidelines, by indication in the left margin. Others make reference to SPiRiT/LEED-NC compliance and related industry standards.

8-3 REVIEW TASKS

Each review task is written in the form of a directive. This format describes the task to be accomplished to ensure compliance with the functional design intent and adequacy of the information related to the requirements of the milestone submission.

APPENDIX A

REFERENCES

The following lists criteria in the form of regulations and industry standards to use in designing ARNG facilities in addition to the references listed in the facility-type design guides. The design A-E should use the current applicable edition of all references.

GOVERNMENT PUBLICATIONS:

1. Executive Office
 - EO 13423, Strengthening Federal Environmental, Energy and Transportation Management.
 - Energy Independence and Security Act of 2007 (EISA 2007)
2. U.S. Army Corps of Engineers (USACE)
 - ETL 1110-1-177, Use of Resin modified Pavement.
 - ETL 1110-3-481, Containment and Disposal AFFF Solution.
 - ETL 1110-3-484, Aircraft Hangar Fire Protection Systems.
 - ETL 1110-3-485, Fire Protection for Helicopter Hangars.
 - ETL 1110-3-491, Sustainable Design for Military Facilities.
 - General Instruction Building and Army Continuing Education System Standard Design Criteria.
 - TI 810-90, Technical Instructions – Elevator

Systems.

Technical Instructions – Structural Design
Criteria for Buildings.

TI 800-01, Design Criteria.

TI 809-04, Seismic Design for Buildings.

TI 810-90, Elevator Systems.

Training Centers – ARNG/USAR Facilities
Standards Booklet.

3. U.S. Green Building Council

USGBC Green Building Rating System
LEED-NC

4. Army National Guard (ARNG)

NGR 415-5, Army National Guard Military
Construction Program Development and
Execution.

NGR (AR) 415-10, Army National Guard
Facilities Construction.

NG PAM 415-12, Army National Guard
Facilities Allowances.

NGR 5-3, Army National Guard Training
Centers (Management).

5. U.S. Department of Agriculture,
Natural Resources Conservation
Service (formerly the Soil
Conservation Service)

TR-55, Urban Hydrology for Small
Watersheds.

<http://www.wcc.nrcs.usda.gov/water/quality/cost.html>

6. Department of the Army

AR 11-27, Army Energy Program.

AR 190-11, Physical Security of Arms,
Ammunition and Explosives.

AR 190-13, The Army Physical Security
Program.

AR 190-51, Security of Unclassified Army
Property (Sensitive and Nonsensitive),
Appendix D.

AR 415-15, Army Military Construction
Program Development and Execution.

AR 420-1, Army Facilities Management.

Army Regulation (AR) 425-15.

DA Form 2028, Recommended Changes to
Publications and Blank Forms.

DA PAM 190-51, Risk Analysis for Army
Property.

TM 5-853-1, Security Engineering Project
Development.

TM 5-853-2, Security Engineering Concept
Design.

7. Department of Defense (DOD)

MIL-HDBK-1022A, Petroleum Fuel Facilities.

UFC 3-600-01, Fire Protection Engineering for
Facilities.

UFC 4-010-01, DOD Minimum Antiterrorism Standards for Buildings.

UFC 3-110-03 Roofing

UFC 3-120-10, Interior Design

UFC 3-400-01, Design: Energy Conservation.

UFC 3-400-02, Engineering Weather Data

UFC 3-440-05N, Tropical Engineering

UFC 3-520-01, Interior Electrical System.

UFC 3-570-2A, Cathodic Protection

UFC 3-580-01, Telecommunications Building Cabling Systems Planning and Design.

UFC 4-610-01, Administration Facilities

UFC 4-722-01, Dining Facilities

8. Department of Energy,
Federal Energy Management
Program (FEMP)

Business Case for Sustainable Design in
Federal Facilities.

9. U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health (NIOSH) Publication No. 2002-139, Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks.

10. U.S. Department of Labor, Occupational Safety & Health Administration (OSHA) 29 CFR Part 1910, Occupational Safety and Health Standards.

OSHA Standards for General Industry, Walking – Working Surfaces, 1910.21–1910.23.

Fall Protection in General Industry, 29 CFR 1910.

11. Department of Justice 2010 ADA Standard for Accessible Design
.

12. Department of Energy (DOE) FEMP (Business Case for Sustainable Design Construction in Facilities; Interagency Working Group).

13. U.S. Environmental Protection Agency (EPA) Comprehensive Procurement Guidelines, www.epa.gov

EPA 832-R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.
40 CFR Part 280, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST) and Part 281, Approval of State Underground Storage Tank Programs.

14. U.S. Department of the Navy TM 6290.99-1, Indoor Firing Range Industrial Hygiene Technical Guide.

UG-2030-SUR, User's Guide on Security
Glazing Applications.

TR-2111-SHR, Planning and Design
Considerations for Incorporating Blast
Mitigation in Mailrooms, Loading Docks, and
Entrances.

TDS-2079-SHR, Planning and Design
Considerations for Incorporating Blast
Mitigation in Mailrooms.

15. -----

Federal Specification AA-D-600B, Door, Vault,
Security.

16. -----

Specification FF-H-105.

NON-GOVERNMENT INDUSTRY STANDARD PUBLICATIONS:

1. American Concrete Institute (ACI)
American Society of Mechanical
Engineers (ASCE), and
The Masonry Society (TMS)

ACI 530/ASCE 5/TMS 402-92,
Building Code Requirements for
Masonry Structures and Commentary.

ACI 318-02, Building Code
Requirements for Structural Concrete
and Commentary.
2. Air Conditioning and Refrigeration Institute

Standards.
3. American Institute of Steel Construction
(AISC)

Specification for Structural Steel
Buildings (Allowable Stress Design
and Plastic Design).

Load and Resistance Factor Design
(LRFD) Specification for Structural
Steel Buildings.
4. American Boiler Manufacturers Association
(ABMA)

Handbooks and standards.
5. American Iron and Steel Institute (AISI)

North American Specification for the
Design of Cold-Formed Steel
Structural Members and Commentary.

Standard for Cold-Formed Steel
Framing – Truss Design.
6. American Conference of Governmental
Industrial Hygienists (ACGIH)

Industrial Ventilation Manual.

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| 7. American Institute of Architects (AIA) | Handbooks and standards. |
| 8. American National Standards Institute (ANSI) | ANSI A115.1, Steel Door and Steel Frame Preparation for Mortise Locks for 1-3/8 In and 1-3/4 In Doors Standard Specification.

ANSI A120.1, Safety Requirements for Powered Platforms for Building Maintenance.

ANSI B31, Code for Pressure Piping.

ANSI/ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality. |
| American National Standards Institute/
Builders Hardware Manufacturers Association (ANSI/BHMA) | Handbooks and standards. |
| 9. American Petroleum Institute | Standards. |
| 10. American Society for Testing of Materials (ASTM) | ASTM D2513, Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.

ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials. |
| 11. American Society of Civil Engineers (ASCE) | Handbooks and standards. |

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| 12. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) | Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings.
Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality
Standard 55-2004: Thermal Environmental Conditions for Human Occupancy
Handbooks of: Fundamentals; HVAC Applications; HVAC Systems and Equipment; Refrigeration |
| 13. American Society of Mechanical Engineers (ASME) | Boiler and Pressure Vessel Code. |
| 14. American Society of Plumbing Engineers (ASPE) | Handbooks and standards. |
| 15. Associated Air Balance Council (AABC) | Handbooks and standards. |
| 16. Consumer Product Safety Commission (CPSC) | Window Glazing Standard |
| 17. Illuminating Engineering Society of North America (IESNA) | Lighting Standards. |
| 18. Institute of Electrical and Electronic Engineers (IEEE) | Handbooks and standards. |
| 20. International Fuel Gas Council | International Fuel Gas Code (IFGC).

Handbooks and standards. |
| 21. Manufacturers Standardization Society (MSS) | SP-58, SP-69, SP-89, Pipe Hangers and Supports. |

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| 22. Midwest Insulation Contractors Association (MICA) | National Commercial & Industrial Insulation Standards. |
| 23. National Fire Protection Association (NFPA) | National Fire Protection Handbooks. |
| | NFPA 10, Fire Extinguishers. |
| | NFPA 13, Installation of Sprinkler Systems. |
| | NFPA 30, Flammable and Combustible Liquids Code. |
| | NFPA 70, National Electric Code. |
| | NFPA 72, National Fire Alarm Code. |
| | NFPA 78, Lightning Protection Code. |
| | NFPA 90A-02/90 B-02, Installation of Air Conditioning, Ventilation and Warm Air Heating Systems. |
| | NFPA 101, Life Safety Code. |
| 24. National Roofing Contractors Association (NRCA) | Roofing and Waterproofing Manual (http://www.nrca.net/technical/manual/default.asp) |
| 25. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) | Handbooks and standards (duct construction). |
| 26. International Plumbing Code | |

27. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

Building Code

Handbooks and standards (duct construction).

28. Steel Deck Institute (SDI)

Specifications and Commentary Diaphragm Design Manual.

29. Steel Joist Institute (SJI) Standard

Specification and Load Tables

30. Telecommunications Industry Association (TIA)/Electronic Industries Alliance (EIA)

568A Standard.

31. U.S. Green Building Council

Leadership in Energy and Environmental Design (LEED™) Building Rating System.

APPENDIX B

GLOSSARY

B-1 ACRONYMS AND ABBREVIATIONS

AABC	Associated Air Balance Council
AASF	Army Aviation Support Facilities
ABA	Architectural Barriers Act
ABMA	American Boiler Manufacturers Association
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
ADAAG	ADA Accessibility Guidelines
A-E	Architect-Engineer
AFFF	Aqueous Film Forming Foam
AHU	Air Handling Unit
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
AR	Department of Army Regulation
ARNG	Army National Guard
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASTM	American Society for Testing and Materials
AT/FP	antiterrorism/force protection

AWI	Architectural Woodwork Institute
BHMA	Builders Hardware Manufacturers Association
Btu	British thermal unit(s)
CBR	California bearing ratio
CCTV	closed-circuit television
CFC	chloro-fluorocarbons
CFMO	construction and facilities management officer
CFR	Code of Federal Regulations
CPSC	Consumer Product Safety Commission
CSI	Construction Specifications Institute
CSMS	Combined Support Maintenance Shops
DA	Department of the Army
DG	Design Guide
DoD	(U.S.) Department of Defense
DOE	(U.S.) Department of Energy
DOIM	Director of Information Management
DWV	drain, waste, or vent
DX	direct expansion
EBU	emergency battery unit
EIA	Electronic Industries Alliance
EO	Executive Order
EPA	(U.S.) Environmental Protection Agency
EPDM	ethylene propylene diene monomer
EPP	environmentally preferred product
ETL	Engineer Technical Letter
F	Fahrenheit
FC	foot-candle(s)
FEMP	Federal Energy Management Program
ft	foot or feet
FTP	file transfer protocol
gpm	gallons per minute

HCFC	hydro-chloro-fluorocarbons
hr	hour(s)
HVAC	heating, ventilation, and air conditioning
IAQ	indoor air quality
IBC	International Building Code
ICBO	International Conference of Building Officials
ICC	International Code Council
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronic Engineers
IEQ	indoor environmental quality
IESNA	Illuminating Engineering Society of North America
IFGC	International Fuel Gas Code
IMA	(U.S. Army) Installation Management Agency
in.	inch(es)
J-SIIDS	Joint Services Interior Intrusion Detection System
lb	pound(s)
LCCA	life cycle cost analysis
LED	light-emitting diode
LF	linear foot/feet
LPG	liquefied petroleum gas
MATES	mobilization and training equipment sites
MICA	Midwest Insulation Contractors Association
MILCON	military construction
MIL-HDBK	Military Handbook
MSS	Manufacturers Standardization Society
NCRA	National Roofing Contractors Association
NEC	National Electrical Code
NFPA	National Fire Protection Association
NGB-ARI	National Guard Bureau, Installations Division
NG PAM	(Army) National Guard Pamphlet
NGR	National Guard Regulation

NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
NRCA	National Roofing Contractors Association
OSHA	Occupational Safety & Health Administration
PAM	Pamphlet
POL	petroleum, oils, and lubricants
POV	privately owned vehicle
PPE	personal protective equipment
psi	pounds per square inch
PVC	polyvinyl chloride
RCAS	Read Clear All Scalars
RH	relative humidity
SDI	Steel Deck Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPIRiT	Sustainable Project Rating Tool
SWPPP	stormwater pollution prevention plan
TI	Technical Instruction
TIA	Telecommunications Industry Association
TM	Technical Manual
TMS	The Masonry Society
TR	Technical Release
UBC	Uniform Building Code
UFAS	Uniform Federal Accessibility Standards
UFC	Unified Facilities Criteria
UL	Underwriters Laboratories
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USPFO	U.S. Property and Fiscal Office
UST	underground storage tank

VE	value engineering
VOC	volatile organic compound
yd	yard(s)

B-2 SPECIALIZED TERMS

exclusive standoff zone	the controlled area surrounding a structure, into which only service and delivery vehicles are allowed
level of protection	the degree to which assets are protected against injury or damage from an attack by an aggressor
Life Cycle Cost Analysis (LCCA)	a systematic means of evaluating the building energy and conditioned space systems for practicality by measuring initial cost against beneficial use over an extended period of time
nonexclusive standoff zone	the controlled area that is used in conjunction with an exclusive standoff zone but provides less restrictive land use

**APPENDIX C
DESIGN REVIEW CHECKLISTS

FOR

DESIGN BID BUILD D/B/B**

NOTE:

**IF CONTRACT IS DESIGN BUILD D/B USE MILCON EXECUTION SLIDE GUIDE
ON PAGE 132 OF THIS DESIGN GUIDE TO INTERPOLATE DESIGN REVIEW
CHECKLIST**

Table 6-1. Design Review Directives

GENERAL COORDINATION ISSUES		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
SITE DEVELOPMENT						
	A complete site survey report has been provided. Before project initiation, the CFMO should provide the design A-E with an approved working or preliminary master plan for the proposed facility site. The State Military Department should provide special instructions for any deviations from the master plan.	■				
1-3.20	Soil Bearing Capacity Declaration and Declaration of Uniformity of Soil Conditions (if applicable) have been provided for the current development and areas of future expansion.	■				
4-2.0	Storm water permit and pollution prevention plan have been obtained/approved.	■	■			
	ARNG Environmental Checklist and Record of Consideration have been reviewed, and a record is included in the narrative.	■	■			
	An Environmental Impact Statement has been completed and approved by the governing agencies.	■	■			
FUEL-DISPENSING SYSTEMS						
	Size of concrete pad and slab design comply with standards.		■	■	■	
	Utility connections meet capacity required based on check of criteria.	■	■	■		
	Spill containment provisions are adequate to meet requirements.				■	■
	Capacity of fuel tanks meets authorized requirement.			■	■	■
WASH PLATFORM						
4-8.0	Size of concrete pad and slab design comply with standards.				■	■
	Water drainage and effluent disposal meet environmental requirements.				■	■
	Water service is adequate based on check of calculations.				■	■
MAINTENANCE						
	Vehicular maintenance areas and equipment comply with environmental criteria and OSHA requirements.				■	■

Table 6-1. Design Review Directives

GENERAL COORDINATION ISSUES	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
1-3.17.1 Safety provisions for the building equipment maintenance area comply with OSHA requirements, including roof perimeter restraints when rooftop equipment is part of the mechanical, electrical, and communications systems.					
Site and building construction materials and details meet the project specific levels of antiterrorism and force protection.					
The U.S. Department of Labor, Occupational Safety & Health Administration (OSHA) Standards for General Industry in 29 CFR Part 1910 and DA PAM 40-503, Industrial Hygiene Program, requires that ARNG provide a safe and healthy workplace for its employees. All Readiness Centers with Indoor Firing Ranges, Logistics and Aviation Maintenance facilities must have an Industrial Hygiene / Chief Surgeon's Office (ARNG-CSG-P) technical review prior to construction.					

Table 6-1. Design Review Directives						
ACCESSIBILITY REQUIREMENTS		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
1-3.7	The site and building design comply with accessibility requirements for the following conditions based on check of the plans and the narrative.					
	Path of travel to the building, including drop-off areas					
	Building entrances including doors and vestibules					
	Horizontal circulation throughout the building, excluding maintenance areas					
	Emergency egress routes					
	Toilet, shower, and locker facilities					
	Drinking fountains					
	Public telephones					

Table 6-1. Design Review Directives					
SITE AND CIVIL ENGINEERING	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
SITE / CIVIL - SUPPORTING DOCUMENTATION					
Based on review, the site survey information includes all existing vegetation, topography, floodplains, rights-of-way, and utility connections at the site perimeter, and all dimensioning is complete.					
Based on review of the Geotechnical Report, adequate soil testing has been done within the proximity of the building construction, including potential areas of expansion.					
Declaration of Soil Bearing Capacity and Decalaration of Uniformity of Soil Conditions have been signed and included with the Geotechnical Report.					
State code and environmental regulations have been identified and are being followed as described in the narrative and code analysis					
The Environmental Impact Statement requirements are being followed in the design.					
SITE / CIVIL - GENERAL					
Calculation confirms that the authorized amount of parking is being provided.					
Review of the site plan indicates antiterrorism standoff areas are in compliance with the project-specific threat assessment and allow for potential future expansion by review of the site plan.					
Check of the site plan indicates security perimeters are clearly defined and have no breaches					
SITE / CIVIL - SUSTAINABILITY					
LEED Review of the narrative confirms that all site design sustanible goals have been clearly defined and are realistic within the project budget. (Support documentation for the SPIrIT program is being developed and included in documentation at each milestone as the project progresses.)					

Table 6-1. Design Review Directives						
SITE AND CIVIL ENGINEERING		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
SITE / CIVIL - BASIC DESIGN						
2200	Cut and fill calculations have been provided; based on review, they reflect balance, or the amount of off-site material required or on-site material removed has been determined.					
2200	General review of proposed final design grading reflects no extremes in topography, and retaining walls are indicated as necessary.					
2370	Based on check of the specifications, erosion control has been adequately addressed.					
2500	Based on review of the narrative and indications on the perimeter of the site survey, all available utilities have been indentified; they are of adequate size to support the new project based on appropriate calculations.					
2500	Based on review of related details, adequate protection of utility elements on grade is provided.					
2500	Based on review of the site plan, utility lines from connection at the site perimeter to the building(s) are the shortest practical distance.					
2501	The fire protection water loop is provided with hydrants placed as required by the local jurisdiction, and is confirmed in writing.					
2630	Based on review of the drawings and narrative, storm drainage design includes a retention basin with support calculations or a stormwater permit for off site drainage.					
2750	Pavement standards have been incorporated into the specifications and cover all conditions for drives, parking, walkways, and site structures.					
SITE / CIVIL - LANDSCAPING						
2810	Irrigation and landscape plans are coordinated for adequate sprinkler coverage based on plan overlay.					
2890	Facility signage meets standard and is adequate for all site entry points based on check of the site plan and specifications					
2930	Landscape species are appropriate for the local environment based on related information included in the design narrative					

Table 6-1. Design Review Directives					
SITE AND CIVIL ENGINEERING	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
SITE / CIVIL - COST ESTIMATING Based on review of the cost estimate, all of the items in the following categories required in the project design have been adequately addressed: Site preparation and demolition Site improvements and landscaping Site utilities Connecting tunnels and bridges Other site systems					

Table 6-1. Design Review Directives					
STRUCTURAL ENGINEERING	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
SEISMIC DESIGN CONSIDERATIONS					
1102	An evaluation of the building configuration (plan and massing) related to transfer of seismic loads has been done and is included in calculations and narrative.				
	Building expansion joints and/or seismic joints are shown on floor plans.				
FOUNDATIONS					
3051	Any development restrictions or other recommendations of the geological investigation have been followed to including building size and location on site.				
3051	The foundation system is in compliance with the Geotechnical Report and takes into account expansive soils, corrosive soils, and any other special characteristics.				
SLAB ON GRADE					
	Floor slabs on grade are being designed based on the recommendations of the Geotechnical Report as described in the narrative.				
GENERAL REQUIREMENTS					
	Live loads have been selected to suit any special requirements of the project based on review of the calculations and narrative.				
	Review of the narrative indicates that equipment having excessive noise and/or vibration has been identified, and proper structural isolation is incorporated into the design				
	Blast and progressive collapse studies have been included and explained in the narrative.				
	Provision of floating slabs to mitigate equipment noise and vibration isolation requirements are identified.				
	The design includes compliance with regard to accommodating maintenance equipment, and when the building is 40 ft or				

Table 6-1. Design Review Directives						
STRUCTURAL ENGINEERING		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
LEED	higher, details at the building perimeter are provided for service equipment supports.					
	Structural systems have been coordinated with fire resistance requirements and protection is identified in the narrative.					
	Specifications call for recyclable products in concrete and cement mixes to the maximum extent allowable, and to the maximum available in structural steel.					
	Structural design has incorporated support for crane systems in maintenance areas.					
	The cost estimate has been checked for inclusion of all structural system components					

Table 6-1. Design Review Directives

ARCHITECTURAL DESIGN		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
GENERAL DESIGN CONSIDERATIONS						
	Based on review of the space program and floor plan layouts, all program requirements are incorporated with optimal functional relationships.					
	Areas with incompatible noise and/or vibration tolerances are remote from one another or are segregated by neutral building elements.					
LEED	The building orientation is in accordance with the site analysis and energy modeling.					
LEED	The building massing configuration and envelop design are in accordance with the related architectural characteristics in the energy analysis model that is used to set the annual energy budget.					
	Building entry and circulation routes are in accordance with security assessment requirements					
	Functional expansion capabilities have been thoroughly analyzed.					
	Custodial and designated facility storage areas have been sized and located appropriately, including direct loading dock access.					
	Dimensions are adequate for vehicular circulation at all service dock areas based on check of the accommodation of the largest vehicles anticipated.					
LEED	Open office areas are not isolated from exposure to natural light by continuous perimeter enclosed functions.					
	A formal vertical transportation study has been performed by a specialist, and the results are reflected in the narrative and the building design.					
	Appropriate methods of access to the roof for servicing equipment are provided and approved in writing by facilities management.					
OSHA	Provisions are included for the method of compliance with OSHA Standard 29 in CFR 19.66 and ANSI A120.1 for accommodating maintenance equipment servicing when a building is 40 ft or higher.					

Table 6-1. Design Review Directives

ARCHITECTURAL DESIGN		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
	All acoustic performance requirements are met, and the method of achieving them is described in the narrative.				■	
	Expansion joints needed due to the length of the building and configuration are determined by a structural engineer and indicated on the architectural plans.			■	■	
8500	All interior pollutant-generating sources (copy rooms, janitor closets, chemical storage areas, etc.) are isolated with separate outside exhaust and slab-to-slab partitions.				■	
	All exterior finishes have been defined in the narrative, details, and cost estimates.			■	■	
LEED	Based on calculations and the narrative, glazing systems are designed as low conductive thermal barriers.		■	■	■	■
	All interior finishes have been defined in detail in the finish schedules.				■	
8710	All required hardware types are identified in the schedule				■	
LEED	Power, data, and telecommunications connectivity at workstations and in meeting areas meet capacity and flexibility requirements.			■	■	
	Building fire protection standpipe system is included on the drawings.				■	
	Blast-resistant materials, systems, and details are integrated into the building perimeter with regard to the project-specific threat assessment.				■	■
	Review of details and specifications indicate that buildings in areas with severe weather conditions have entry mats integrated with grills or grates and drainage systems in vestibules.				■	
	Dock levelers or scissor lifts are provided to accommodate various truck bed heights in the drawings and specifications.			■	■	

Table 6-1. Design Review Directives						
ARCHITECTURAL DESIGN		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
LEED	Performance requirements for testing thermal resistance of the building envelop construction (thermal graphic imaging) have been incorporated into the specifications.				■	
10440	Review of details and specifications indicate that a comprehensive signage and graphics program has been developed based on a thorough review of paths of travel including all interior conditions, and meets standards.			■	■	
LEED	Forrest Stewardship Council principles and criteria are met for specified wood products.		■	■	■	
LEED	Paints and coatings comply with Green Seal standard based on review of specifications.		■	■	■	
LEED	Adhesives and sealants comply with VOC content limits described in LEED guidelines.				■	■
NCRA	Roofing design and penetrations follow standards based on specifications and detail references.				■	
SMACNA	Flashing details follow standards				■	
	The architect has confirmed, based on diagrams, that servicing and parts replacements can be accomplished within the dimensional limits of equipment rooms.		■	■	■	
	Based on the narrative, a minimum roof slope of 1/50 is provided and that the architect has coordinated this requirement with the structural engineer.				■	■
	Based on review of details and specifications, dock areas are protected from extreme climatic conditions by overhead rolling doors and dock seals where appropriate.			■	■	
	Based on check of the specifications, overhead-supported toilet partitions are being used throughout the facilities.			■	■	
AWI	Based on specification requirements, all architectural woodwork is designed according to the AWI Quality Certification Program.			■	■	■
	Suspended ceiling bracing is incorporated where seismic zones dictates and related details are included in the drawings.				■	

Table 6-1. Design Review Directives						
ARCHITECTURAL DESIGN		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
LEED	Based on specification, carpet systems meet or exceed the <u>Carpet and Rug Institute Green Label Indoor Quality Test</u> .				■	■
	Based on review of reflected ceiling and equipment plans, ceiling access to equipment above is through lay-in ceiling systems to the maximum extent possible.				■	
	Cost estimate includes all architectural components.			■	■	■
10100 10670	All requirements for specialties including markerboards, tackboards, and shelving are included in the documents.				■	■

Table 6-1. Design Review Directives						
MECHANICAL ENGINEERING		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
GENERAL DESIGN CONSIDERATIONS						
LEED	The design target for annual energy budget has been determined and the mechanical design is in accordance with related modeling of the architectural design.					
	Utility service availability has been determined and outlined in the narrative.					
	The narrative identifies acoustic and/or vibration isolation needs for spaces near HVAC equipment.					
	The extent of sub-metering required has been determined in writing.					
LEED	LEED sustainability and energy conservation goals have been defined and continually reviewed for compliance.					
	Functional layouts of architectural plans have been assessed to optimize efficient air handler zones, and zones are aligned separately between fully occupied areas and partially occupied areas.					
	Equipment will be located above the 100-year floodplain.					
LEED	The building automation system will follow LEED recommendations.					
	Based on calculated service clearances and pathway dimensions, adequate room is provided for major equipment replacement.					
	Based on confirmation in writing, the facilities engineering staff has the training and expertise to maintain and operate the proposed HVAC systems and controls.					
	High maintenance equipment for every system has been described in the narrative.					
	Based on description in the narrative, optimum flexibility is designed into the systems for classrooms, meeting spaces, and assembly halls.					
	HVAC equipment will not be visible from the exterior of the building.					
LEED	Effective methods for providing off-hour HVAC operation have been defined and are included in the narrative					

Table 6-1. Design Review Directives						
MECHANICAL ENGINEERING		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
	Based on Life Cycle Cost Analysis, HVAC alternatives have been considered					
	The limits imposed by value engineering decisions are clearly identified in writing.					
	An air flow balance for off-hours of operation has been calculated..					
	The level of plant equipment redundancy has been established by the A-E and facility maintenance staff and is reflected in the preliminary equipment schedule and the narrative.					
LEED	A detailed preliminary Commissioning Plan, including requirements for implementation strategy, has been incorporated into the narrative and specification language.					
LEED	Economic viability of all LEED credits is checked and updated at each phase.					
	Description in the narrative indicates compliance with all seismic zone requirements for stabilizing equipment will be done.					
	Provision is made for appropriate access to service equipment that cannot be maintained from ground floor level.					
	Based on placement on the site plan drawings, underground or above-ground mounted storage tanks will not be located close to buildings, railroad trackss, or roads.					
	Service agreements and appropriate durations are incorporated into the specifications, and a list of all necessary provisions is included in the narrative.					
	Specifications call for all necessary training and a thorough spare parts list under each related category, and indicate the extent of the requirements provided as a list in the narrative.					
	An analysis has been performed to verify the need of water treatment for boilers, humidifiers, and cooling towers; and if required, it is addressed in the specification is addressed in the specifications.					
1-3.12	All warranty requirements for mechanical equipment are included in the respective specification sections, and all the specfic warranties are listed in the narrative.					

Table 6-1. Design Review Directives					
MECHANICAL ENGINEERING	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
LEED				■	■
Based on listing in the narrative, building automation system control and monitoring points meet minimum requirements.				■	■
Specifications contain instructions to bidders for documentation and product literature necessary to support the LEED goals.				■	■
Cost estimate includes all mechanical system components.			■	■	■

Table 6-1. Design Review Directives						
PLUMBING ENGINEERING		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
LEED	The potential for gray water use is described in the narrative.					
	A metering strategy to effectively monitor water consumption from an overall efficiency standpoint is used and described in the narrative.					
	Water service, sanitary drainage, and storm drainage calculations are completed and summarized in the narrative.					
	Domestic water heating approach (storage, instantaneous, circulated, points-of-use) has been determined and included in the narrative.					
	Preliminary water pressure has been determined, and the narrative describes whether pumping will be necessary.					
	Requirements for sewage ejectors and/or sump pumps are identified in the narrative.					
	Pipe and insulation materials have been identified in the specifications.					
	The intent to meet or exceed water conservation standards is economically viable based on cost analysis.					
	Toilet fixture count is adequate for occupancy and accessible accommodation is being provided by standard as indicated in the narrative.					
	Geotechnical Report has been reviewed, and provision is included for foundation and/or underslab drainage system as indicated in the narrative and specifications.					
	Specifications provide for grease interception and/or recovery for kitchen fixtures and drains.					
	Based on check of specifications, fuel storage tanks are provided with leak detection and alarm.					
	Natural gas meter and service pressure regulator are protected from vehicular damage, foundation settlement, and vibration					
	Cost estimate includes all plumbing components.					
Pipe sizes are coordinated with utility connections by check of the site survey information.						

Table 6-1. Design Review Directives						
ELECTRICAL		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
LEED	Commitments to energy management have been established including lighting controls and energy monitoring systems, and are indicated in detail in the narrative.					
	Based on analysis in the narrative, all existing building electrical systems and power source(s) are adequate for expansion or renovation loads.					
	Requirements for cathodic protection have been determined from the Geotechnical Report, and if needed are defined in the narrative.					
	All special equipment power requirements are identified by listing in the narrative.					
	Utility rebate programs have been investigated for availability and applicability.					
	The narrative indicates that adequate service and expansion space has been provided at major equipment locations.					
	The electrical system is being designed with adequate spare capacity by listing in the narrative.					
	Statement in the narrative indicates that all electrical equipment is located above the floodplain.					
	All lighting control conditions are defined in the narrative					
	The site lighting design minimizes lighting intensity off site by incorporating directional fixtures at the perimeter.					
	UPS is provided in the electrical requirements for critical service items listed in the narrative.					
	Lightning protection requirements have been defined in the narrative.					
	A separate green, insulated equipment ground conductor has been incorporated into all feeder and branch circuits by					
LEED	Mercury-free transformers and lamps are being specified.					

Table 6-1. Design Review Directives

ELECTRICAL		SUBMISSION				
		SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
	Emergency generators have adequate ventilation and are located away from HVAC air intakes; and sound and/or vibration isolation is provided.			■	■	
	Based on check of schedules, panels have at least one circuit breaker per 200 ft2 of coverage in office areas.				■	
	Based on check of schedules, panelboards have adequate spaces and spares.				■	
LEED	Daylighting sensors are called for on the building perimeter and included in the specifications.			■	■	
	The building automation system includes the requirements and has the capacity to monitor normal, emergency, and uninterruptible power; mechanical systems and controls; fire detection and suppression; security systems; lighting; communication equipment; gas; and exhaust..			■	■	
	Receptacles placed for cleaning are located in all open spaces and corridors.				■	
	Based on check of diagrams and floor plans, electrical service has been provided for all related site elements including lighting and security systems.				■	
	One emergency receptacle has been placed in each electrical closet, communications equipment room, mechanical room, and electrical equipment room.				■	
	Cost estimate includes all electrical system components	■	■	■	■	■
	Lighting power budget calculations have been provided if required by the energy code.			■	■	
	Door schedule indicates special items, including fire alarm hold open, security devices, and power-operated doors.				■	
	There is clear indication of division of work between building contractor and utility company.				■	
	Battery-powered lights have been provided in the generator and switchgear rooms.				■	
LEED	A minimum of 10% spare breakers in panelboards have been provided.				■	

Table 6-1. Design Review Directives					
ELECTRICAL	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
All quantities of outlets, spacing, and type meet program requirements.					
Based on review, lighting calculations meet energy code.					
Based on check of drawings, location of structural foundations and electrical ductbanks are not in conflict.					
By check of schedules, all lighting type and space illumination levels meet program requirements					
By check of schedules and code requirements, all emergency lighting requirements are met.					

Table 6-1. Design Review Directives					
FIRE PROTECTION	SUBMISSION				
	SUBMITTALS (10%)	CONCEPT (30%)	PRELIMS (60%)	FINAL (90%)	BFI (100%)
All Federal, state, and local codes and amendments are included in the narrative.	■	■			
The local water supply has sufficient capacity for future expansion of the fire protection system.	■	■			
Fire access roads are not in conflict with future building plans on the proposed site, and access is provided 24 hours a day when the roads are behind security barriers.		■			
The emergency generator has been specified with extra capacity for future loads as described in the narrative.				■	■
Water tank sizes have extra capacity for future expansion as described in the narrative.			■	■	
UL assembly numbers, compartmentalization, rated walls, and penetration conditons are indicated on the drawings.				■	
Based on check of the specifications, the fire alarm system includes capacity for future expansion.				■	
Dimensional check shows that the location of major fire protection equipment, to include fire pumps is accessible for service.				■	
Fire extinguishers and/or cabinets are located on the plans.				■	■

**APPENDIX D
FIGURES/LIST**

Figure 1. Small Kitchen Equipment Layout

Figure 2. Large Kitchen Equipment Layout

FOOD SERVICE EQUIPMENT LIST

FIGURE 3 PCU IN A SCIF

MILCON EXECUTION SLIDE GUIDE

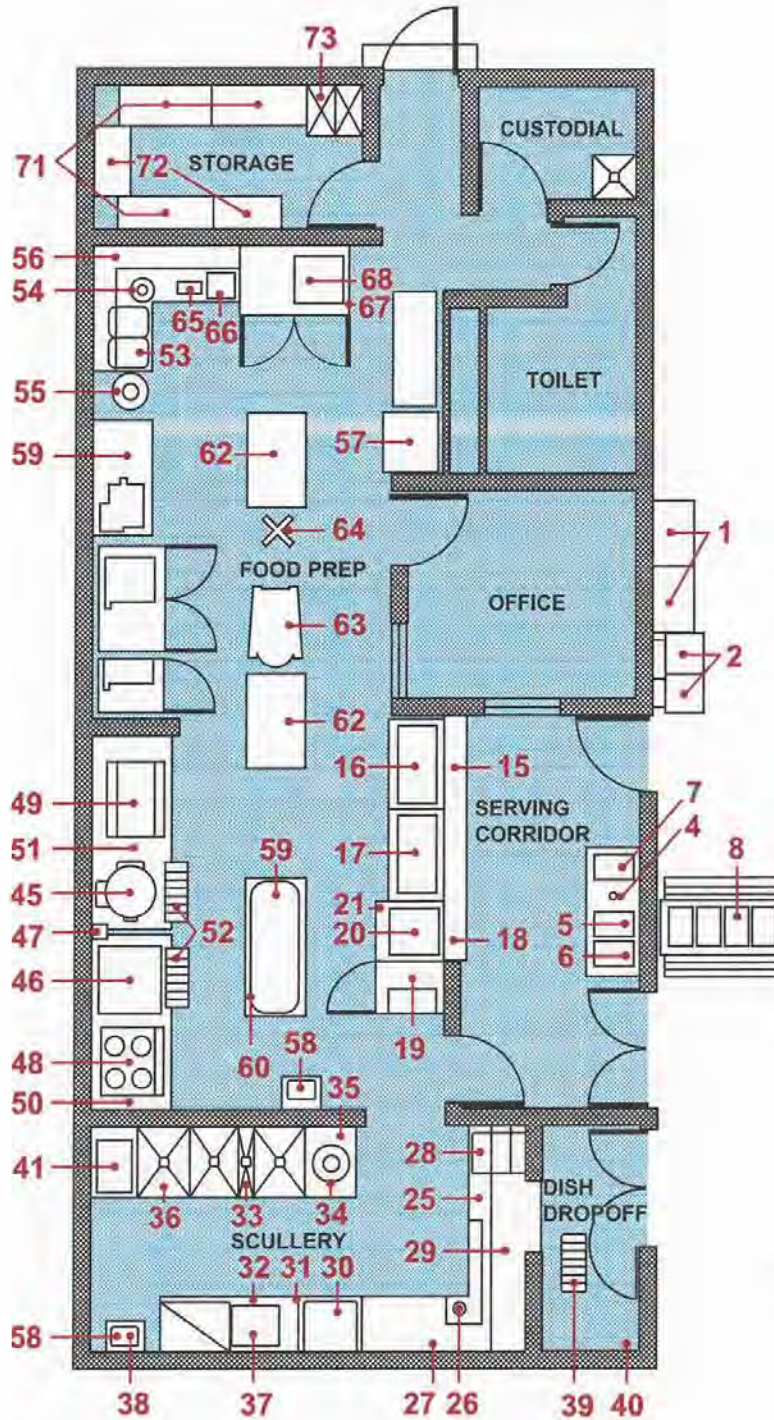


Figure 1. Small Kitchen Equipment Layout

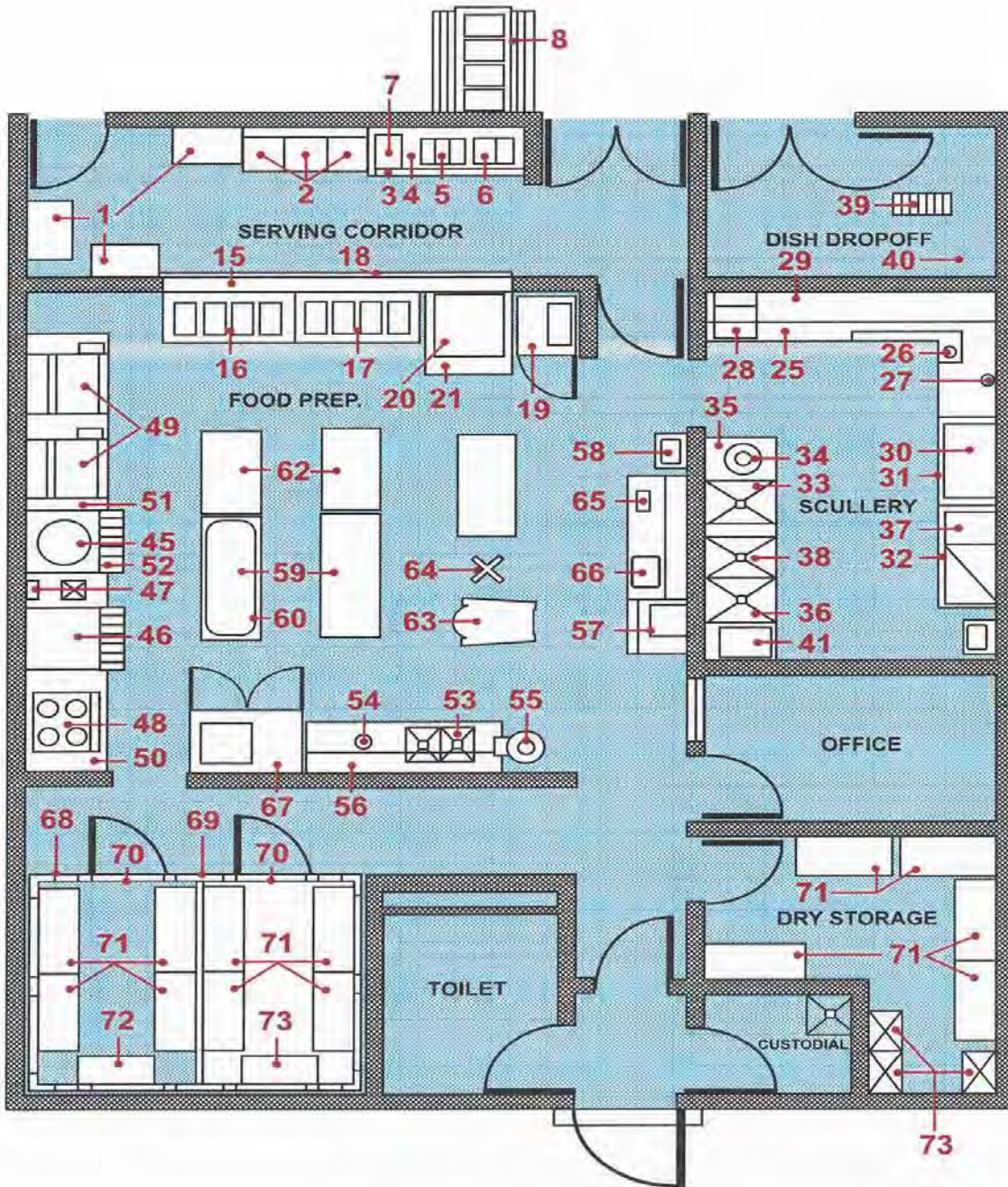


Figure 2. Large Kitchen Equipment Layout

Self-Serve, Beverage, Salad, and Dessert Areas:

- 1 Dispenser Regular -Service Tray and Silverware
- 2 Dispensers - Tableware
- 3 Stand - Drinks
- 4 Water Cooler
- 5 Dispenser - Juice
- 6 Urn - Coffee
- 7 Ice Dispenser
- 8 Cold Food Counter
- 9 to 14 Not Used

Serving Line Area:

- 15 Serving Counter
- 16 Cold Pan (Drop-in)
- 17 Hot Food Table (Drop-In)
- 18 Tray Slide
- 19 Food Warming Cabinet
- 20 Griddle
- 21 Exhaust Hood
- 22 to 24 Not Used

Scullery Area:

- 25 Soiled Dish Table
- 26 Garbage Disposal
- 27 Spray Assembly
- 28 Soaking Sink
- 29 Wall-Mounted Shelf
- 30 Dishwashing Machine
- 31 Exhaust Hood - Dishwasher
- 32 Dish Table
- 33 Pot and Pan Sink
- 34 Garbage Disposal
- 35 Spray Assembly
- 36 Water Heater - Under Sink
- 37 Water Heater
- 38 Exhaust Hood - Over Sink
- 39 Floor Trough
- 40 Spray Assembly
- 41 Water Heater
- 42 to 44 Not Used

Kitchen, Storage, and Refrigeration Areas

- 45 Steam Kettle - Jacketed
- 46 Frying and Braising Pan
- 47 Water Meter
- 48 Heavy Duty Range
- 49 Baking and Roasting Oven
- 50 Exhaust Hood
- 51 Exhaust Hood
- 52 Floor Trough
- 53 Vegetable Preparation Sink
- 54 Garbage Disposal
- 55 Vegetable Peeling Machine
- 56 Wall-Mounted Shelf
- 57 Ice Machine
- 58 Hand Sink
- 59 Food Preparation Table
- 60 Kitceh Utensils Rack
- 61 Not Used
- 62 Food Preparation Table
- 63 Food Mixing Machine
- 64 Mixer Stand
- 65 Can Opener
- 66 Meat Slicing Machine
- 67 Frozen Food Cabinet
- 68 Refrigerator
- 69 Refrigerator (Not in Small Kitchen)
- 70 Plastic Strip Doorway Closure
(Not in Small Kitchen)
- 71 Shelving
- 72 Wall Lockers
- 73 Hand Shelf Truck
- 74 Air Curtain Machine (Fly Control)

Food Service Equipment List

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
						COMMERCIAL		

SELF-SERVE, BEVERAGE, SALAD AND DESSERT AREAS:

1	DISPENSER, RECTANGULAR, Service Service Tray, Automatic W/Silverware Holder, Stainless Steel	C		X	7320-01-009-2867	COMMERCIAL	8 Silverware Holders, For Dispensing Trays	
2	DISPENSERS, Tableware, Self-Leveling, Cups, Bowls Tumbler, Stainless Steel	C		X	7320-00-738-8404	COMMERCIAL	(Cups, Bowls And Tumblers, Unheated) (Cantilevered, Carrier), Size (20"x20"/Racks (Mobile Casters) ,	
3	STAND, Drink, (Hot/Counter) Stainless Steel	A	X		NNSN	BUILT TO ORDER AS PER PLAN	Mariner Edge Top, W/Tray Slide, Drain Trough and Drain Line	2" Drain Line
4	GLASS FILTER WATER COOLER	A	X				Mounted on the Stand, Drink (Hot) Counter, Stainless Steel	
5	DISPENSER, Juice, Mechanically Refrigerated, Electric, Triple	C		X	7310	COMMERCIAL	(Dispenser W/Agitation System But W/O Aeration System), For Pulpy Fruit Juices, and other Beverages not suitable for Aeration, (Triple Bowl), (capacity of 5 to 6 gallons per bowl) 15-18 gallons total capacity inclusive, Counter-Mounted Separate Toggle Switch Req'd For Independent Bowl) Operation	Electric, 115 V, 60HZ 1PH, 1/5HP, ncm 5-15 Plug
6	URN, Coffee, Twin, Automatic, 6 Gallon Capacity, Electric OR URN, Coffee, TWIN, Automatic, 6-Gallon Capacity Gas	A	X		7310	COMMERCIAL	(Counter or Stand Mounted, Twin or Single URN) (3-Gallon Capacity Each Compartment), (Electric Heated), Use with Item #3.	Electric, 208V, 60HZ, 3PH, 12KW, ½" CW Inlet
			X		7310	COMMERCIAL	(Counter or Stand Mounted, Twin or Single URN) (3-Gallon Capacity Each Compartment), (Gas Heated, Not applicable to Single Unit), Use with	Gas, 45,000 BTU Electric, 115V, 60HZ, 1PH, ½" CW Inlet

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION COMMERCIAL	REMARKS	UTILITIES
7	ICE DISPENSER, Load, W/Automatic Dispensing Head, 150 LBS Storage Capacity	A	X		NNSN	COMMERCIAL	Item #3, Furnished To Operate on Natural Gas Stainless Steel Exterior, Stainless Steel Evaporator, Manual Fill Access Door	Electric, 115V, 60HZ, 1PH, 15 AMPS, 1/4HP
8	COLD FOOD COUNTER, Mechanically Refrigerated Mobile, Self Contained, Electric, 4 Compartment	C		X	7310-01-077-6502	COMMERCIAL	(4 Food Storage Pan Capacity W/Bumpers & Casters Sneeze Guard W/Tray Rail On Both Sides	Electric, 110V, 60HZ, 1PH, 1/2" Drain

ITEM NUMBERS 9-14 NOT USED

SERVING LINE AREA

15	COUNTER, Serving, W/8 Opening SEE DETAIL DRAWINGS AND PLAN 4.03, 4.04, 4.04A AND 3.04 W/Sneeze Guard and Pastry Display	A	X		NNSN	BUILT TO ORDER	Stainless Steel, Used to Support Items 16 & 17, Sneeze Guard and Double Deck Pastry Display	Nona
16	COLD PAN, Drop-In, Mechanically Refrigerated, 1 Piece Construction Typical Producer: Atlas Metal Industries, 4 Compartment w/pastry display	A	X		NNSN	COMMERCIAL	Condensing Unit Located Below Cold Pan, On/Off Switch, W/Adapter Bars, 3 Opening Capacity, Stainless Steel	Electric 115V, 60HZ, 1/4HP, 6AMPS
17	TABLE, Hot Food, Drop-In, Electric Stainless Steel, W/Drain, Size 4, (4 Compartment) 15 Watts, Per Opening, Typical Producer: Atlas Metal Industries	A	X		NNSN	COMMERCIAL	(3 Food Storage Compartment), 12 Inch Pans X 20 inch Food Storage Pans, (With Drain), 1500 Watts Per Opening	Electric, 220V, 60HZ, 3HP, 9KW
18	TRAY SLIDE, Stainless Steel, mounted on wall (see detail drawing and plan 4-04)	A	X		NNSN	CUSTOM BUILT	Mounted on Top of Concrete /Block wall, Tray Slide To Accomodate 14"W X 18" L Tray, Use with Items 15, 16, and 17	NONE
19	CABINET, Food Warming, Reach-In Electric	A	X		7310-01-086-2867	COMMERCIAL	Modified Commercial 2 Compartment Each Compartment	Electric, 208V 60HZ, 1PH

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMBRNG	NATIONAL STOCK NUMBER	SPECIFICATION COMMERCIAL	REMARKS	UTILITIES
20	GRIDDLE, Self-Heating, Electric W/Griddle Stand (38"W, 34"D, 26"H) OR GRIDDLE, Self Heating, Gas Fired, W/Griddle Stand, (36"W, 34"D, 26"H)	A	X		7310	COMMERCIAL	Shall Hold Ten or More 12"X20" X 4" Pans, and A Minimum of Thirteen 18"X 26" Bun Pans, or Trays of 12: X 20"X 2" Food Service Fans Open Frame, Griddle Stand Leg Mounted, with support brackets	Electric, 208/230V 60HZ, 3PH, 14KW
21	HOOD, EXHAUST, W/Grease Automatic Wash down system, Stainless Steel	A	X		7320-01-295-4308 NSN	BUILT TO ORDER AS PER PLAN	Griddle Stand, Stationary, (Leg mounted), W/Quick Gas, Disconnect, (Furnished to Operable On Natural Gas) W/Vapor Proof Fluorescent Lights, W/Enclosure Panels, (Ends Closed), W/Fire Suppression system, (Chemical or Water), fire/fuel delay Timer included NFPA 13 & 96.	Gas, 81,000 BTU 115V, 60HZ, 1PH Power Control Electric Motor Water

ITEM NUMBER 22-24 NOT USED

SCULLARY AREA

25	DISH TABLE, Soiled, W/Scrap Trough Pre wash Sink, (W/Faucet And Drain Lever. Build slot in wall to allow silverware to be dropped in sink.	A	X			BUILT TO ORDER AS PER PLAN	Constructed Of 14 Gauge Stainless Steel, With 6" Back splash, W/Scrap Trough	
26	GARBAGE DISPOSAL MACHINE Typical Producer: Salvajor 5 HP II Model 500	A	X		4540	COMMERCIAL	5HP Stainless Steel, Control Center, Circuit Breaker, Automatic Reversing, Positive Flush, 6-8" Diameter Throat Cut-out, Used with Item #25 Dish washing Area.	Electric, 208V, 60HZ, 3HP, 1/2" CW
27	SPRAY ASSEMBLY, Pre-rinse, Wall mounted	A	X		NNSN	COMMERCIAL	W/Wall Bracket, (Horizontal) Water Supply, Spray W/Water Mixing Control Valve, (7 1/4" to 8 1/4" on center) Self Closing Spray Valve	1/2" HW & CW IPS Female Inlet

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

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ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCOM	OMABNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
28	SINK, Silver, Soak, Stainless Steel, 34 Deep, Mobile, W/Lever Drain Valve, Part of Item #25 Built in W/Removable Basket	A	X		7320-01-295-4308	COMMERCIAL	Stainless Steel, Sink Built Into Soil Dish table, W/Stainless Steel, Wall Slot From the Drop Off Corridor Wall (Drop Off Window)	NONE
29	SELF, Wall Mounted	A	X		7310-NNSN	BUILT TO ORDER AS PER PLAN	Constructed Of One inch Stainless Steel Tubing With Stainless Brackets Supports, 16 Gauge SS, 2" back splash Rounded Corners, All Edges, Turned Up 1 1/2", To be Used W/D-3-3.	
30	DISHWASHING MACHINE Commercial Stationary, Electric, (50 Racks Per Hour)	A	X		7320-01-028-3787	COMMERCIAL	Size 50-20, (20" X 20"), Racks, (Straight Feed) .50 Racks Per Hour (Notes: An Exception to Specification, (W/O Detergent Meter)	Electric, 208V 60HZ, 3PH, 1HP, 50KW, Heating Element, 18KW Booster, 1/2" Inlet, 2" Drain
31	HOOD, Exhaust, Dishwasher, Condensate	A	X			BUILT TO ORDER AS PER PLAN	Used W/Item #30	
32	DISH TABLE, Clean, Stainless Steel W/Lower Storage Shelf	A	X		NNSN	BUILT TO ORDER AS PER PLAN	Used W/Item #30	NONE
33	SINK, Pot and Pan, Stainless Steel, 14 Gauge No 3 or 4 Finish, 3 Compartments, W/Drain Boards, ASFT 300 Series, W/Swing Faucets	A	X		NNSN	COMMERCIAL	W/Swing Faucets and Mechanical Lever Drains Sink Compartments Will be 30"W X 28" D X 16"H W/Adjustable Bullet Feet, W/9" Back splash, Covered Corners Single Faucet For Third Sink 180 Degrees Water	1/2" EW & CW 1 1/2" Drain
34	GARBAGE DISPOSAL MACHINE, Electric 5HP	A	X		NNSN	COMMERCIAL	5HP, Control Center, Circuit Breaker, Automatic Reversing, Positive Flush, 6-8" Diameter Throat Cut Out	Electric, 208V, 60HZ, 3PH, 1/2" CW, 2" Waste Drain

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
35	SPRAY ASSEMBLY, Pre-rinse, Wall Mounted	A	X		NNSN	COMMERCIAL	W/Wall Bracket, (Horizontal Water Supply), Spray Unit, W/Water Mixing Control Valve, (7 1/4" To 8 1/4" on center), Self-Closing Spray Valve	1/2" HW & CW IPS Female Inlet
36	HEATER, Sink, Hot Water Booster, Electric Sanitizing	A	X		4520-01-041-2184	COMMERCIAL	9 KW, 180 Degree Hot Water Booster, For Final, Rinse Compartment Of the Pot and Pan Sink, Item #33	Electric, 208 V, 60HZ, 1PH, 9KW, 3/4" Inlet
37	HEATER, Hot Water, Booster Electric	A	X		4520-01-042-0409	COMMERCIAL	This item is designed, To Heat And Recirculate Only, Not to Heat the Water inside the Rinse Compartment.	Electric, 208V, 60HZ, 3PH 15KW
38	HOOD, Exhaust, Sink, Stainless Steel, SEE DETAIL DRAWING AND PLAN 5.07	A	X		MMSN	CUSTOM BUILT		Electric Motor
39	FLOOR TROUGH, W/Grate	A	X			COMMERCIAL		
40	SPRAY ASSEMBLY, Pre-rinse, Wall Mounted	A	X		NNSN	COMMERCIAL	W/Water Mixing Control Valve, (7 1/4" To 8 1/4" On Center) Self-Closing Spray Valve.	1/2" HW & CW IPS Female Inlet
41	HEATER, Hot water, Booster, Electric	A	X			COMMERCIAL	15KW, 180 Degrees Hot Water For The Dish washing Machine	208 V, 60HZ, 3PH 15KW

ITEM NUMBERS 42-44 NOT USED

KITCHEN, STORAGE, REFRIGERATION AREAS

45	KETTLE, Steam Jacketed, (Stainless Steel), 20 Gallon Electrically Heated	A	X		7310-00-355-8343	COMMERCIAL	(Floor Model), (20 Gallon Capacity), 3" Tangent Draw-Off Assembly	Electric, 208V, 60HZ, 3PH, 15KW, 1/2" Inlet
	OR							
	KETTLE, Steam Jacketed, (Stainless Steel) 20 Gallon Gas Heated	A	X			COMMERCIAL	(20 Gallon Capacity), Leg Mounted, W/3" Tangent Draw-Off Assembly, Hinged Cover, Swing Spout, (Furnished To	Gas, 110,000 BTU, 115V, 60HZ, 1PH, 1/2" Inlet

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
46	PAN, Frying and Braising, Electric, Tilting Type, Stainless Steel, 7" Deep 30 Gallon Capacity	A	X		7310	COMMERCIAL	Operate On Natural Gas), Quick Gas Disconnect Required (W/O Extension Frames and Trays), (Non-Insulated Pan Side walls), (Floor Mounted), Size (40"L X 23"D X 7"H Pan Depth), (W/O Casters), With Tilting Mechanism, W/Hinged Cover, Terminal Block For Permanent Connect	Electric, 208V, 60HZ, 3PH, 15KW Drain Trough Required.
	OR							
	PAN, Frying and Braising, Gas Heated, Tilting Type Stainless Steel 7" Deep 30 Gallon Capacity	A	X		7310	COMMERCIAL	(W/O Extension Frames and Trays), (Non-Insulated Pan Side walls), (Floor Mounted), (40"L X 23"D X 7"H Pan Depth), (W/O Casters), With Tilting Mechanism, W/Hinged Cover, Burner Indicator Lights Are Required, (Furnished To Operate On Natural Gas), Quick Gas Disconnect is Req'd	Gas, 70,000 BTU, 115V, 60HZ, 1PH, Controls, Drain Trough Required
47	METERS, Water, Automatic, Industrial, Accuracy + - 1/2, Dispense 12 Gallons per minute	A	X		MNSN		With Hot and Cold Water Mixing Valve, Temperature Controls, Capacity, 70 LBS/Minute, W/Mounting Brackets, 100/200/400 LBS, W/Standard Dial Setting	Electric, 120V, 60HZ, 1PH, 1/2"HW & CW
	TYPICAL PRODUCER: Gemini Bakery Equipment, Model AMM Or Equal		X					
48	RANGE, Heavy Duty, Electric, Commercial, w/3 Hot Plates, (Hot Top)	A	X		7310-01-034-6169		W/Oven, (3 Hot Plates, (Minimum Size 12" X 24")Stainless steel Front and Sides, W/6" Legs (Adjustable)	Electric, 208V, 60HZ, 3PH, 24KW
	OR							
	RANGE, Heavy Duty, Gas, Commercial, Open Top, W/4	A	X		7310-00-823-7379	COMMERCIAL	W/Oven, W/4 Open Top Burners, Stainless Steel Front and sides	Gas, 162,000 115V, 60HZ, 1PH,

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
	Open Burns							
49	OVEN, Baking and Roasting (Stainless Steel) Forced Convection, Electric, 2 Compartments OR For Gas Oven See Item 49 On Small Food Service Kitchen Equipment Schedule	A	X		7310-00-353-5633	COMMERCIAL	W/6" Legs (Adjustable), Furnished To Operate On Natural Gas (Two Oven Compartment), (Standard Oven Cavity), W/2 Speed Blower Motor Stainless Steel Interior, Stainless Steel exterior, Both Doors Will Have Heat Resisting Safety Viewing Glass	Controls Electric, 208V, 60HZ, 3PH, 1 1/2 HP. 3TKW
50	HOOD, Exhaust, W/Grease Automatic Wash down System, Stainless Steel, Fire Suppression System W/Clean Access Door For Clean Out	A	X		NNSN	COMMERCIAL	W/Vapor Proof Fluorescent Lights, W/Enclosed Panels (Ends Closed), W/Baffles, NFPA 13 & 96 (Fire Extinguishing System, Water or Dry Chemicals	Electric, Water
51	HOOD, Exhaust, Condensate, Stainless Steel	A	X		NNSN	COMMERCIAL	W/Vapor Fluorescent Lights, W/Enclosed Panels (End Closed)	Electric, Water
52	FLOOR THROUGH, W/Grate	A	X		NNSN	COMMERCIAL	Used W/Items # 45 & 46	NONE
53	SINK, Vegetable Preparation Stainless Steel No3 or 4 Finish, Covered Corners, ASTM Series W/SS Counter	A	X		NNSN	COMMERCIAL	2-Compartments, W/Drain Boards, W/Swing Faucets and Mechanical Lever Drain, Sink compartment Will Be 24"W X 28" X 14" H, With One 3/4" Wire Mesh Basket 20"W X 20"D X 12"H, Stainless Steel	1/2" CW & HW Swing Water Spouts, 1-1/2" Drain Line
54	GARBAGE DISPOSAL MACHINE, Electric, Commercial, 3HP	A	X		NNSN	COMMERCIAL	3HP, Control Center, Circuit Breaker Automatic Reversing, Positive Flush 6"-8" Diameter Throat Cut-Out.	Electric, 208V, 60HZ, 3PH, 3HP, 1/2" Water Inlet, 2" Waste Outlet
55	VEGETABLE PEELING MACHINE, Electric, 30 Pounds Capacity, W/Garbage Disposal (Optional)	A	X		7320	COMMERCIAL	(Floor-Mounted), 30 Pounds Of Potatoes, Per Charge) Complete W/Disposal, Waste & Disposal Stand Base, Stainless Steel Base, & Abrasive Or Ribbed Wall Cylinder	Electric, 115 V, 60HZ, 1PH, 1 1/2HP Disposal Motor 1/2HP included 1/2" CW, 2 1/2" Drain
56	SHELF, Wall Mounted,	A	X		7310-NNSN	BUILT TO ORDER	Constructed of One Inch	

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

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ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
	Stainless Steel					AS PER PLAN		
57	ICE MAKING MACHINE, Cube Automatic Mechanical, Refrigerated, Self Contained Electric	A	X		4110	COMMERCIAL	(Air Cooled Condenser), 400 Pounds, Capacity, (Stainless Steel Cabinets, 300 Series Only)	Electric, 208V, 60HZ, 1PH, 2PH 1 1/2" drain line
58	SINK, Hand Lavatory, Stainless Steel, Typical Producer: SECO Products Model HS-11-2A ADVANCE MODEL 7-PS-32 METAL MASTER MODEL HSAJ-10-FL	A	X		MNSN	COMMERCIAL	No. 3 or 4 Finish, Cited Dimensions, W/Soap/Towel Dispenser, Wrist Off/On Lever	1/2 HW & CW, 1 1/4" Drain
59	TABLE, Food Preparation, (Stainless Steel)	A	X		7320-00	COMMERCIAL	(Rolled Rim Top) (72" X 30" X 36") W/Under shelf, A (Stainless Steel Top, Frame & Fixed In Place W/Electric Outlets	Electric, 110V, 60HZ, 1PH
60	RACK, Table, Kitchen Utensils (Stainless Steel) For Mounting On Food Preparation Table, W/Sliding Hooks, Three Bars, Uprights, Table Mounted	A	X		7320-00-893-4728	COMMERCIAL	Detail Drawing 1.18 (Contractor will Provide) Use with Item 59	NONE
61	OPEN NUMBER							
62	TABLE, Food Preparation, Mobile, Stainless Steel, Rolled Rim Top	C		X	7320-00-008-7635	COMMERCIAL	(Rolled Rim Top,) (48"L X 30"W X 36" H) (With Under shelf), (Stainless Steel), (With Casters)	NONE
63	MIXING MACHINE, Food Electric (Vertical), (Commercial Type), 20 Qt Capacity	C		X	2726	COMMERCIAL	Size 20(20 W Bowl Capacity) Bench Mounted With Vegetable Cutting, Slicing Attachments	Electric, 120V, 60HZ, 1PH
64	STAND, Mixer, W/Attachment Meat Rack	C		X	7320	COMMERCIAL	For Use With 20 QT Mixer, W/Under shelf	

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
65	OPENER, Can, Heavy Duty Electric	C		X	7330-00-272-2590	COMMERCIAL	Portable, W/Lid Lifter Use W/Item 59	Electric, 115V, 60HZ, 1PH
66	MEAT SLICING MACHINE, Automatic, Electric	C		X	7320-00-355-8389	COMMERCIAL	80 Slices Per Minute, Size 1, Bench Required.	Electric, 115V, 60HZ, 1PH, 1/3HP
67	FROZEN FOOD CABINET, Mechanically, Refrigerated, Stainless steel, 45 Cu Ft, Reach-in	A	X		4110-01-024-8990	COMMERCIAL	Reach-In 4 doors, Air Cooled Hermetically sealed condenser, with shelves	Electric, 208 V 60HZ, 3PH, 34HP
68	REFRIGERATOR, Prefabricated Mechanical cooled, Commercial Walk-in Dairy	A	X		MNSN	COMMERCIAL	Type I (Refrigerator) Style A (Flooders Design), Remote and Air Cooled Refrigeration system	Electric, 208V, 60HZ, 3PH,
69	REFRIGERATOR, Prefabricated Mechanically Cooled Commercial Walk in Vegetables	A	X		MNSN	COMMERCIAL	Type I (Refrigerator) Style A (Flooders Design), Remote and Air Cooled Refrigeration System	Electric, 120V, 60HZ, 3PH, 3HP
70	Doorway Closures, Plastic Strips Typical Procedures W. B McGuire Co, Inc Model SF 300 or Kelly Co Model 303 or equal	A 2	X		MNSN	COMMERCIAL	Transparent, Overlapping Strip Rounded edge constructed Designed for low and Standard Temperature, (300X to 1500X F) Used W/R 2 Series Item(10A/10B/10C, Max Thickness .125 Inches	NONE
71	SHELVING, Stainless Steel Mobile, Food Service	C		X	7125	COMMERCIAL	Type II Style I (Mobile), (Wire Construction), W/5 Adjustable Shelves, W/5-Inch Casters, W/Bumper Guards	NONE
72	LOCKERS, Wall, Metal, Tier OR SECURITY UNITS	A	X		7125-NNSN	COMMERCIAL	One Door, W/5 Shelves, W/Legs, To Be Used To Store, Containers of Condiments, Local Purchase and Authorized Security Unit W/Casters	
73	TRUCK, Hand Shelf, Pot and Pan Rack, Stainless Steel	C		X	3920-00-171-9306	COMMERCIAL	(4 Shelves, 2 Fixed & 2 Adjustable), 800 Pounds Capacity, W/Bumpers & Casters	NONE

ARMY NATIONAL GUARD FOOD SERVICE EQUIPMENT SCHEDULES

ITEM NO.	ITEM DESCRIPTION	LOG Class	MILCON	OMARNG	NATIONAL STOCK NUMBER	SPECIFICATION	REMARKS	UTILITIES
74	AIR CURTAIN FLY CONTROL MACHINE	A	X			COMMERCIAL	Air Velocity , Measured Three Feet Above The Floor Will Be 500 FPM For Personnel Entrance Ways, and Receiving Doors, Micro switch For Automatic, On/Off Air Curtains Must Cover Complete Width Of, The Door, Machine Must Be Installed Above The Exterior Of The Door.	Electric, 208V, 60 HZ, 1PH, 1/2HP

NOTES:

- Point of Contact is as follows:
 Army Center of Excellence Subsistence
 U.S. Army Quartermaster Center and School
 ATSM-CES-0E, 1201 22nd Street
 Building P-5000
 Fort Lee, VA 23801-1601
 Tele. No. DSN 687-3450 Comm. (804) 734-3450
 FAX. DSN 687-5108 Comm. (804) 734-5108
 ATTN: Mr. Goldie M. Bailey
- LOG CLASSIFICATIONS:
 A: Equipment authorized to be installed (i.e. attached to the floor and or permanently connected to the building structure or utility system) as part of the construction contract.
 C: Portable equipment which will be provided through supply channels and owner installed (and which should not be included in the construction contract) and for which no utility hook-ups are required (but which should be considered in the Space layout and operational plan).

- For Food Service Equipment Layout Sketch
 See Design Guide (DG) 415-5, Appendix D,
 Figure-1: Small Kitchen Equipment Layout,
 Figure-2: Large Kitchen Equipment Layout
- FUNDING CLASSIFICATIONS:
 MILCON: Military Construction
 OMARNG: Operation & Maintenance Army National Guard

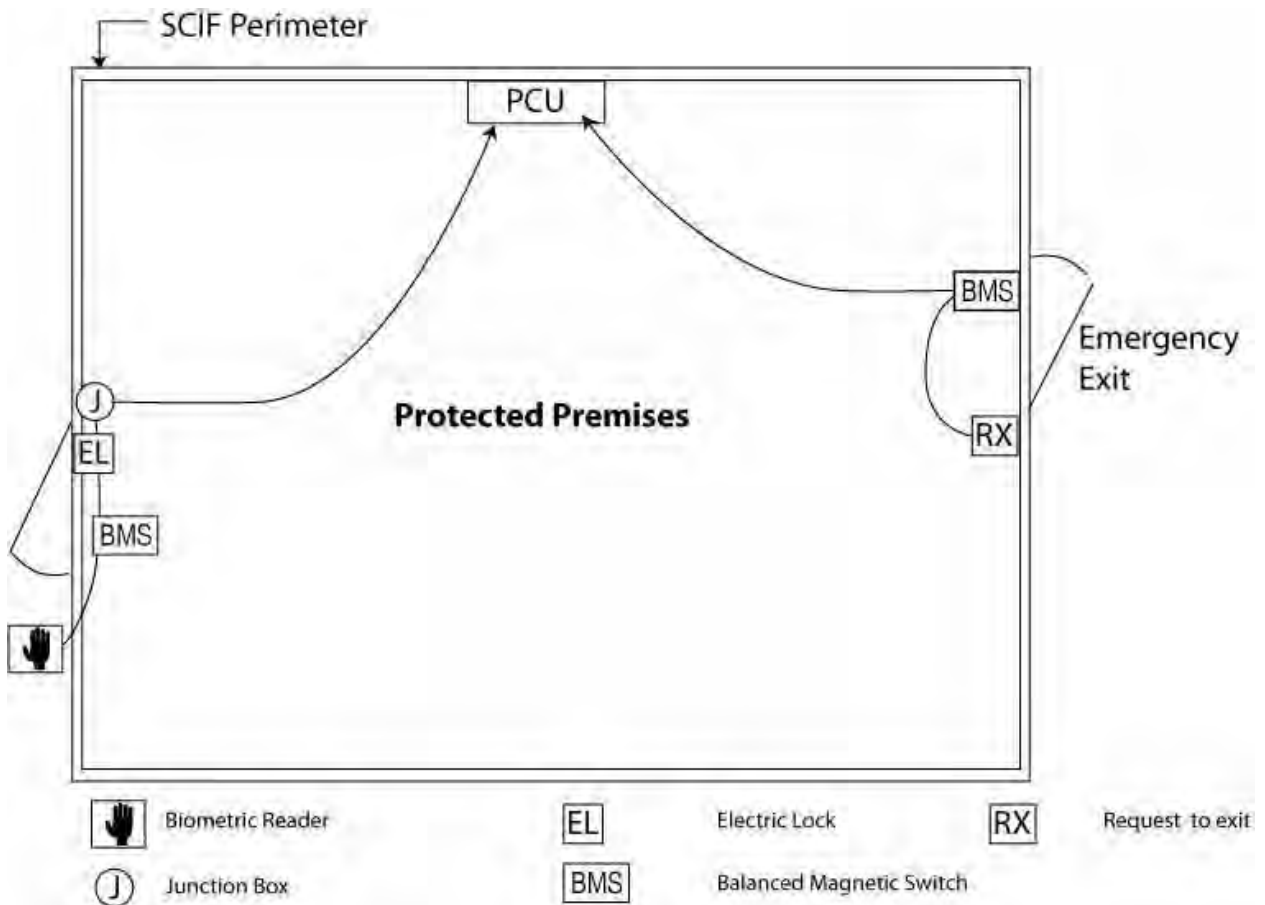


FIGURE 3 PCU IN A SCIF



MILCON Execution Slide Guide

<u>%DES (Design)</u>	<u>Design Bid Build D/B/B</u>	<u>Design Build D/B</u>
• 1% = Design Release from DA		
• 2% = 1390 approved & Design Authority issued to State		
• 3% = A/E Contract or RFP Awarded		
• 30% = Concepts received by CFMO/NGB from the AE/State		1390/91, MCCA & Cost Validation
	<u>Expected Submissions: Land-CT/License; NEPA-EBS; Rec/Check; EA; & EIS</u>	
• 35% = Concepts approved by CFMO/NGB		Initial / Draft RFP
• 60% = Prelims received by NGB from the State.....		Pre-Final RFP
• 65% = Prelims approved by NGB		Select Final Proposal (GMP)
• 90% = Finals received by NGB from the State.....		
• 95% = Finals approved by NGB		
• 100% = Bid finals approved by NGB.....		

AWARD CONSTRUCTION CONTRACT

<u>FORECAST</u>	- Expected Construction Award Date	<u>OUT YEARS</u>
	<u>CURRENT YEAR</u>	Meeting Milestones
• Green	- WILL AWARD in FY	<u>NOT</u> Meeting Milestones
• Yellow	- Projected Award Date Beyond FY	
• Red	- NO FORECAST - No Projected Award Date	

AWARD SELECTED PROPOSAL

ATTACHMENT E

NGR 415 ARMY NATIONAL GUARD PROGRAM DEVELOPMENT AND EXECUTION



TETRA TECH

National Guard Regulation 415-5

Construction

Army National Guard Military Construction Program Development and Execution

National Guard Bureau
Arlington, VA 22204
6 March 2015

UNCLASSIFIED

SUMMARY of CHANGE

NGR 415-5
ARMY NATIONAL GUARD MILITARY CONSTRUCTION
PROGRAM DEVELOPMENT AND EXECUTION

This revision, dated 6 March 2015 --


- o Follows Department of Army publication format, reorganizing chapters by acquisition phases (Planning, Programming, Budgeting and Execution).
- o Includes references to the Army National Guard Military Construction Budget and Programming Guidance.
- o Includes information on the Military Construction Cooperative Agreement removed from the updated National Guard Bureau Office of Principal Assistant Responsible for Contracting regulation NGR 5-1.
- o Includes updates to the Design Build Delivery System & introduces Construction Manager at Risk / Construction Manager General Contractor.
- o Includes comment about the congressional notification for Unspecified Minor Military Construction projects.
- o Includes information on Planning Charrettes.
- o Removes DD Forms 1390/91 detailed instructions.
- o Clarifies Environmental terms substituting the Environmental Baseline Study with Environmental Condition of Property.
- o Addresses Contract Modifications reference requirements.
- o Adds the President's Budget Submission information.
- o Includes references to the Readiness Center's minimum total authorized strength.
- o Removes all mentions of Facility Center and replaced with PRIDE.
- o Removes mention of Federal/State Agreement.
- o Includes references to subject to the availability of funds solicitation authorization.
- o Clarifies percent of Federal funding reimbursement for Federal Contracting/Federal land.

Construction

**ARMY NATIONAL GUARD MILITARY CONSTRUCTION
PROGRAM DEVELOPMENT AND EXECUTION**

By Order of the Secretary of the Army:

JUDD H. LYONS
Major General, GS
Acting Director, Army National Guard

Official: 
Charles P. Baldwin
Deputy Chief of Staff

History. This printing publishes a revised regulation of the NGR (AR) 415-5, dated 18 July 2003, which is hereby rescinded.

Summary. This regulation provides guidance for planning, programming, budgeting, and executing all Military Construction Army National Guard (MCNG) projects.

Applicability. This regulation applies to the Army National Guard and all MCNG funded in whole or in part with a military construction appropriation.

Proponent and exception authority. The proponent of this regulation is the Installations Division Chief, Army National Guard (ARNG-ILI). The proponent has the authority to approve exceptions to this regulation that are consistent with controlling law and regulation. This authority may not be delegated.

Management Control Process. This regulation contains management control provisions in accordance with AR 11-2, key management controls that must be evaluated in NG Pam 415-5.

Supplementation. Supplementation of this regulation requires the approval of the Army National Guard, Installations Division, ARNG-ILI, 111 South George Mason Drive, Arlington, VA 22204.

Suggested Improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to the Army National Guard, Installations Division, ARNG-ILI, 111 South George Mason Drive, Arlington, VA 22204.

Distribution. B.

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* This regulation supersedes NGR (AR) 415-5, 18 July 2003.

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Chapter 1

General

1-1. Overview

This regulation provides basic policies, responsibilities and requirements for the Adjutant General (and staff) for the development and execution of the Military Construction Army National Guard (MCNG) program. This includes guidance on planning, programming, budgeting, designing, contracting, and managing projects. Also, it prescribes the means for achieving high quality, cost effective military construction within schedules that meet the needs of the facility users and attain and maintain the compliance with Federal and State laws and regulations. The term State is used in this regulation to include the 50 States, the three territories and the District of Columbia.

1-2. References

Required and related publications are listed in Appendix A.

1-3. Explanation of Abbreviations and Terms

Abbreviations and special terms used in this regulation are explained in the glossary.

1-4. Responsibilities

The following responsibilities are applicable to this regulation in general.

a. The Under Secretary of Defense (Comptroller) (USD-C) is the approval authority for military construction budget submissions and for funding of authorized and appropriated projects.

b. Assistant Chief of Staff for Installations Management (ACSIM) is the Army staff element responsible for programming funds for facilities programs and for providing policy guidance for all areas and activities associated with programming facilities funds. Also, provides replacement facilities for ARNG units displaced at Army installations in accordance with DoD 1225.07.

c. The Assistant Secretary of the Army for Installations, Energy and Environment (ASA-IE&E) has the principal responsibility for all Department of the Army matters related to installations and environment, energy, safety and occupational health.

(1) Has overall responsibility for providing guidance on installation facilities, housing, energy initiatives and environmental policy and program direction. This includes approving and forwarding Congressional actions to OSD and Congress.

(2) Provides project reviews of all military construction budget submissions and approves the overall submission before its submittal to OSD.

(3) Approves all military construction projects for both design and construction release.

(4) Delegates work classification authority to Chief, National Guard Bureau.

d. Assistant Secretary of the Army for Financial Management and Comptroller (ASA-FM&C) controls military construction appropriation funds and manages the budget as provided in AR 1-1.

e. Chief, National Guard Bureau (CNGB) establishes National Guard priorities and policies to support the commanders of the unified combatant commands, the military services, and the States and delegates work classification authority to Installations Division Chief. Also, advises DA program coordinators of program implications resulting from force structure and stationing changes, Base Realignment and Closure (BRAC) initiatives, or congressional actions (for example, for MILCON and non-MILCON program additions).

f. Director, Army National Guard (DARNG) as the MILCON appropriation sponsor acquires, manages and distributes resources to meet the ARNG priorities and to influence the development of policies in order to support the commanders of the unified combatant commands, the military services, and the States.

g. Chief, Army National Guard, Installations Division (ARNG-ILI) serves as the primary advisor to the DARNG regarding Installations. The ARNG-ILI Chief administers military construction to support the mission of the Army National Guard and is responsible for the planning, programming, acquisition, operation and disposal of ARNG land, utilities, infrastructure and facilities. Other responsibilities include:

(1) Provides resources and policy guidance to the States regarding facilities planning, programming, acquisition, design, construction, inspection, maintenance and repair, and disposal.

(2) Recommends policy to the Director, Army National Guard, involving military construction for the ARNG and implements approved policy.

(3) Develops and directs planning, programming, and budgeting involving military construction for the ARNG.

(4) Provides professional and technical guidance and assistance to the States in developing, managing, and executing a sound MCNG program in accordance with current DoD and DA policies, and industry construction standards, practices, codes, and principles.

(5) Chairs the Facility Review Committee and superintends the prioritization of MCNG projects.

(6) Serves as the proponent for readiness centers.

h. Army National Guard, Environmental Programs Division (ARNG-ILE) provides guidance, recommendations, and assistance to the States in the environmental aspects associated with planning, programming, siting, and scoping military construction projects. Reviews and approves all environmental documentation required to acquire and construct real property as part of the MCNG program. Serves as a non-voting member of the Facility Review Committee (FRC), provides guidance and assistance in project prioritization.

i. Army National Guard, Logistics Division (ARNG-ILS) serves as the proponent for surface maintenance and logistics facilities and provides guidance, advice, assistance, and recommendations regarding functional requirements, criteria, programming, and design review for surface maintenance and logistics facilities. As a voting member of the FRC, provides guidance and assistance in project prioritization.

j. Army National Guard, Training Division (ARNG-TR) serves as the proponent for training facilities and training centers and provides guidance, advice, assistance, and recommendations regarding functional requirements, criteria, programming, and design review for training facilities and training centers. As a voting member of the FRC, provides guidance and assistance in project prioritization.

k. Army National Guard, Aviation and Safety Division (ARNG-AV) serves as the proponent for aviation facilities and provides guidance, advice, assistance, and recommendations regarding functional requirements, criteria, programming, and design review for aviation facilities. As a voting member of the FRC, provides guidance and assistance in project prioritization.

l. The Adjutant General (TAG) provides strategic direction for the preparation and update of the State's Real Property Development Plan (RPDP) and is the State authority for cooperative agreements.

m. United States Property and Fiscal Officer (USPFO) serves as the contracting agent for all MCNG projects executed through Federal procedures, unless the State makes a request to ARNG-ILI to delegate that responsibility to another Federal construction agent (U.S. Army Corps of Engineers or the Naval Facilities Engineering Command).

(1) Accountable and responsible for the proper obligation and expenditure of all MCNG funds provided to the State through Military Construction Cooperative Agreements.

(2) Responsible to monitor, advise, and assist in the MCNG program, to ensure that Federal funds are expended only on the authorized scope, as set forth in NGB-PARC cooperative agreement directives. Ensure projects are executed through the Federal Acquisition Regulation (FAR) and its supplementary procedures.

(3) Responsible for the certification of Federal funds for those projects executed through State procedures, Military Construction Cooperative Agreement (Federal/State Agreement) compliance, and final project acceptance.

(4) Responsible to review and approve any interagency agreement assigning design and construction supervision to a State agency other than the Military Department.

(5) Accountable officer for reporting all Federally-owned real property and the responsible person to sign the DD Form 1354 as the Federal representative upon project completion.

n. The Construction and Facilities Management Officer (CFMO) serves as principal advisor to the Adjutant General on all aspects of the State's facilities including the MCNG, O&M and in most cases environmental programs, being the principal point of contact for all the State's facilities programs.

(1) Leads the development, justification, and execution of all military construction (specified and un-specified) projects in design and construction for the State ensuring the functionality, operability, and maintainability characteristics of all military construction projects.

(2) Accomplishes short and long-range planning, with the Adjutant General's approval, for future development of land, facilities, and infrastructure of the State, following the master planning methodology of ARNG Directorate master planning directives and any other published regulations and policies.

(3) Prepares a complete and comprehensive economic analysis for each proposed MCNG project in accordance with DA Pam 415-3 to justify project, its location, and scope before commencing design.

(4) Fully coordinates with all facility users, functional proponents, and other appropriate State staff elements to ensure the maximum functionality and usability of each project and the project compliance with all statutory, regulatory, and code requirements.

(5) Prepare completed project documentation on designated MILCON projects per ARNG-ILI instructions. Ensure all non-construction funded requirements including OMA or OPA cost related to these projects have been identified and are shown in the appropriate fiscal years to provide facilities which are ready for the user to commence operation upon beneficial occupancy.

(6) Serves as member and Records Custodian of the Joint Service Reserve Component Facility Board for the State. Stores all records of the Board, submits all required reports, assures all required minutes of the Board's proceedings have been received by ARNG-ILI, and may serve as Chair on a rotating basis.

Chapter 2 Planning

2-1. Overview

Project planning supports the Adjutant General's vision by identifying alternatives and establishes a strategy for future development that may or may not include construction. During the planning phase, the baseline of existing facility conditions is established along with all the facility requirements to satisfy current and future mission necessities to support the States missions and readiness.

2-2. Facility Requirements

a. Real Property Development Plan (RPDP) identifies the Adjutant General's goals and objectives for development and operation of the State and its supported installations. It identifies major work to be done to real property to assure continued mission performance. To accomplish this, the RPDP:

(1) Documents results of the planning process.

(2) Depicts all projects that bring the States facility inventory to an ISR-I F-2, Q-2, or C-2.

- (3) Provides a decision-support tool to identify requirements and alternatives for resolving real property deficiencies/excesses.
- (4) Provides the basis to support acquisition, management, accountability, and disposal of real property.
- (5) Provides the framework and decision support tool for supporting requested military construction projects.
- (6) Provides supporting information, assisting the State with developing programming documents for MCNG projects.
- (7) Must be regularly updated and submitted annually to ARNG-ILI (Refer to the ARNG MILCON Budget and Programming Guidance).

b. Long Range Construction Plan (LRCP) consists of a prioritized list of MCNG projects required by the State to implement its RPD. This plan provides the State's input into ARNG Directorate's updated prioritization of the entire MCNG program. For details refer to the ARNG MILCON Budget and Programming Guidance from ARNG-ILI.

c. Infrastructure Requirements Plan (IRP) is a process which produces a prioritized list of MCNG projects from all States. This list is formed using a model from the programming guidance that prioritizes all projects on States' submitted LRCPs. Based on a variety of weighted factors; the model includes the highest priorities of the Adjutant General, while integrating national level military construction needs and programmatic and statutory priorities. The criteria in the IRP are determined by the Facilities Review Committee (FRC), which contains ARNG Directorate and State membership. Recommendations of the FRC are presented to the Director, Army National Guard for final approval. The highest ranking projects from the IRP process become part of the Future Years Defense Program (FYDP), while the remaining projects become the unfunded military construction requirements of the ARNG. Instructions are in the ARNG MILCON Budget and Programming Guidance update each cycle.

2-3. Real Estate Considerations

The Construction and Facilities Management Officer (CFMO) shall determine whether any proposed construction project requires acquisition of real estate interests and what such interests would cost. When acquiring real property to support MCNG projects follow and adhere to the provisions in the ARNG Real Estate Manual.

a. The relationship between the Army National Guard (ARNG) Directorate and the State Military Department is governed by the fact that all ARNG facilities are owned by, leased for, permitted to, or licensed to the States. As a result, the States, and not the Federal government, operate and maintain all ARNG facilities.

b. The identification of an adequate, cost-effective site is the first step in successfully executing a MCNG project. When selecting real property for MCNG projects, the CFMO shall maximize the use of existing real property and joint use with other DoD components. A factual justification will be required if the CFMO proposes unilateral construction to support the conclusion that joint facilities are not practical or economically advantageous to the Federal government.

c. When acquiring land for MCNG projects, the CFMO will select real property that on a long-term basis most economically meets the State's training, mission, support, and operational requirements and is consistent with the Adjutant General's planning philosophy.

d. In making a major land acquisition using Federal funds, the CFMO will comply with DoDI 4165.71.

e. The following is a prioritized list of methods of acquiring real property to satisfy MCNG requirements:

(1) Use of existing, underutilized Federal or State owned facilities, especially those of other DoD Components (both Reserve and Active). This may include re-stationing force structure to maximize the use of existing facilities.

(2) Use of existing, available, excess or vacant Federal real property, via transfer, license, use agreement, permit, or purchase, including maximum use of facilities excess because of base realignment and closure actions.

(3) Donation, or lease at no cost to the Federal or State government, of existing privately-or publicly-owned real property, provided that only minimal additional construction is required.

(4) Additions/alterations to existing DoD facilities or new construction on DoD installations provided that provisions are made to maximize joint use.

(5) Purchase of existing privately or publicly-owned real property, provided that only minimal additional construction is required.

(6) Construction of a new facility to be jointly used by at least one other DoD component.

(7) Construction of a new facility to be solely used by the ARNG. As much as possible, design and provide a site that will accommodate future expansion for joint use.

f. The State lease of State-owned or private property to the Federal government for a proposed readiness center project requires a 25 percent State share. Donating land to the Federal government to avoid State share for a Readiness Center is prohibited. See paragraph 4-3 Authorized Charges for descriptions of Federal/State cost shares for MILCON projects.

g. The existence of a Federal lease of State-owned property does not normally qualify a proposed readiness center project on such a site for 100 percent Federal reimbursement of design and construction costs. Instead, unless an exception is granted by the Assistant Secretary of the Army (Installations, Energy and Environment), should a readiness center project be approved for such a site, the State share of 25 percent still applies.

2-4. Site Selection

a. The purchase or lease of State land to support a proposed or programmed construction project is a State responsibility. This includes the actual property acquisition, any required boundary surveys, Environmental Condition of Property (ECOP), and any other environmental documentation required for the acquisition of the site. The ECOP can be federally funded only for acquisition of Federal land. For information refer to ARNG Real Estate Manual and the Army National Guard Bureau Environmental Condition of Property (ECOP) Handbook.

b. A good selection process determines the most suitable site, considering land availability, support of unit readiness and recruiting/retention goals, current and future zoning that may influence encroachment and the economics of site preparation,

environmental impacts and other effects on construction costs. As part of the site selection process, the CFMO investigates all prospective sites for conformance with the following requirements:

- (1) The size of the site for a facility must have adequate acreage to accommodate the project scope including antiterrorism/force protection (ATFP) requirements.
- (2) The sites selected for other projects shall provide adequate area to support mission requirements.
- (3) Front on at least one public street or road, while ensuring adequate standoff to meet conventional construction ATFP requirements.
- (4) Have adequate access roads from nearby population centers and from public highway networks. Preferably should be served by public transportation.
- (5) Be free from low-lying areas, steep slopes, faults, and other prospective nuisances.
- (6) Have uniformly contoured terrain that is either level or only slightly sloping (less than 4 percent).
- (7) Have soil at the frost line depth for the locality with a minimum bearing capacity of 2,000 pounds per square foot on natural, undisturbed earth.
- (8) Have accessible public utilities necessary and required for successful operation of the facilities being constructed. Connection to existing utility system beyond building property line is limited to 300 linear feet; see NG Pam 415-12 for details.
- (9) Be protected by local zoning regulations so as to permit the construction and full use of a facility and to prohibit the establishment of any activities or industries that would adversely affect the operation of the facility.
- (10) Be uncontaminated land, free from the prospect of hazardous substances that could subject the State or Federal government to liability for response, clean-up, and health costs or for natural resource damage costs, and free from conditions that would prevent or affect the construction, occupancy, and future operation of the facility.
- (11) Should avoid former landfills, fuel farms, waste treatment facilities, and other potentially contaminated sites.
- (12) Should not be sited in flood hazard areas or areas subject to sea level rise and storm surges.
- (13) When siting new construction, preference shall be given to brownfields and other previously-developed lands, proximity to existing supporting infrastructure (e.g., utilities), and connectivity to transportation modes/networks where feasible.

c. Once the State has made a tentative site selection and has received design authority, it conducts an engineering site investigation. The investigation includes a minimum number of soil borings, based on visual observation of the site and knowledge of the local area, in order to determine the nature and consistency of sub-surface soil strata conditions. Additional borings may be necessary if the first results are insufficient or inconclusive to use to design foundations. Soil borings from the selected site becomes part of the site survey report required by paragraph 5-6l (1).

d. The Federal government does not normally support construction costs associated with work to correct site deficiencies at locations that do not conform to the specifications in paragraph 2-4 b. If the site does not conform, the State must submit a memorandum clearly justifying its siting decision, including documentation such as an economic analysis justifying increased construction costs.

e. Acquisition of sites for military construction projects has to comply with applicable requirements of the National Environmental Policy Act (42 U.S.C. §§4321-4370a), National Historic Preservation Act (16 U.S.C. §470 et. seq.), Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C., Chapter 103), and other environmental requirements (See AR 200-1 and 32 CFR Part 651). The CFMO uses the guidelines contained in these statutes and regulations to help select project sites and initiates the required environmental processes before requesting funds for design and construction.

f. The acquisition of real property for a construction project requires at minimum an ECOP (typically this would be an Environmental Baseline Study (EBS) for Federal property and an Environmental Site Assessment (ESA) for the State property) to determine the extent of potential liability of the Federal government should it approve the project at that site. If the project is on an installation with a previously approved ECOP, the State completes an Environmental Survey and Clearance for Construction. As appropriate, the State should use the sampling required for environmental contamination to supplement the soil borings required in paragraph 2-4c above.

g. Because of the potential liability for excess construction costs for poor site selection, the CFMO should carefully examine all proposed sites for their slopes, drainage, rock, soils, unexploded ordnance (UXO), and environmental hazards, contamination or constraints (i.e., soil or groundwater contamination, wetlands, presence of endangered species, or cultural sites). States may have to fund excess construction costs if they elect to choose a given site in lieu of an acceptable site.

2-5. Planning and Programming Charrettes (PPDC)

a. Planning Charrettes (Not to be confused with a Design Charrette) are used to validate the information and assumptions that were made in the preparation of the DD Forms 1390/1391. A PPDC is conducted at FY-5, (i.e. FY13 ARNG-ILI was conducting PPDC's for FY18 FYDP projects). PPDC's utilize 2065 sustainment funds and cannot be conducted once 2085 MILCON funds have been allocated to a project. Refer to the ARNG MILCON Budget and Programming Guidance for more information on the procedures for a PPDC.

b. While planning and programming charrettes are an important tool to ensure MILCON projects are properly scoped and include the requirements of all stakeholders; NGB can only fund charrettes with OMNG funds for some MILCON projects and only after the project has been accepted for the FYDP. Considerations as to which planning and programming charrettes are funded by NGB depend on the availability of funds, complexity of the project, and project cost. States are encouraged to conduct their own charrettes at a time of their choosing at their own expense. However when a State needs NGB funding support for a planning or programming charrette, the CFMO should request such after the project is placed on the FYDP.

c. Where projects have multiple stakeholders, or are complex in nature, PPDCs are viewed as reasonable if not essential. The proper document to initiate a planning and programming charrette is a draft 1390/91. The CFMO should request funding for

PPDCs through the Operations and Maintenance program; master planning funds are the appropriate Management Decision Evaluation Package (MDEP), or the CFMO may elect to fund the PPDC through their normal OMNG allotment. PPDCs conducted during the development of DD Forms 1390/1391 should receive full State and ARNG-ILI support. Detailed reviews of RFPs should be conducted by all organizations that have a vested interest in each project. This includes but is not limited to; the user, the project proponent and the ARNG-ILI representative.

d. For further guidance see the USACE Engineering and Construction Bulletin 2003-8 (Rev 1).

Chapter 3 Programming

3-1. General

MILCON programming is the process of acquiring both the authority and resources necessary to meet facility requirements identified by the planning process. A construction project with an estimated cost greater than the Operations & Maintenance (O&M) funded ceiling is normally funded through the MILCON Program. Requirements, identification, feasibility studies, DD Forms 1390/91 creation, etc., should be programmed for and accomplished prior to formally initiating a project into the ARNG MILCON program. For a project to be considered, the State CFMO needs to reference annual ARNG MILCON Budget and Programming Guidance for specific minimum requirements. A project is not considered an actual funded project until it has been authorized and appropriated by Congress.

a. ARNG-ILI obtains programming and budgetary resources based upon ARNG Directorate's success in the annual Program Objective Memorandum (POM) process. ARNG-ILI applies these programming funds against the highest MCNG priorities nationwide annually to prepare its next MCNG President's Budget submission, to update its FYDP, and to create a prioritized, unfunded MCNG list. In some cases, Congress may provide additional resources during the annual budget authorization and appropriation cycle.

b. A project remains on the FYDP until Congress authorizes and appropriates it, the Adjutant General cancels it, or the State fails to comply with the MCNG programming and project documentation process. Also, a Department of Defense element (including the Secretary of Defense, the Secretary of the Army, or the Chief, National Guard Bureau) can decide to remove it from the program. ARNG-ILI oversees the development of the funded MCNG project list (the FYDP) and the unfunded MCNG list (the IRP) after doing a detailed analysis of the annual LRCP submissions from all CFMOs and convening the Facility Review Committee.

c. Cost on the DD Forms 1390/1391 are for programming purpose and are not the actual fund amounts for State to execute the project. The actual funding is predicated on the construction bid amount. The bid savings not used for the project will support the overall ARNG MILCON program on projects requiring additional funds due to bids exceeding programmed amount.

3-2. Project Limitations

a. The Military Construction Army National Guard (MCNG) program consists of three parts, each with a separate authorization and appropriation line from Congress; Major Construction (i.e., specified projects), Unspecified Minor Military Construction (UMMC), and Planning and Design (P&D). Once appropriated, funds may not be moved from one part to another without a formal Congressional reprogramming action.

b. Each MILCON project shall result in a complete and usable facility or a complete and usable improvement to a facility. Avoid combining work on multiple facilities of different types into a single project. Combining multiple projects into a single, lump sum request is prohibited, except when each project is in the same general facility category (i.e. supply facilities, maintenance and production facilities, etc.) and the required completion date of each facility is programmed in the same fiscal year.

c. Major MILCON projects are programmed separately. Every MCNG construction undertaking must be individually authorized and funded in military construction legislation or performed under special statutory authority (e.g., 10 U.S.C. §2803 or 10 U.S.C. §2854). UMMC and P&D funding is authorized and appropriated as a lump sum and are managed at the appropriation level by ARNG-ILI.

d. No entity within the State nor any tenant organization (including the Active Army and other DoD components) shall start any project work without the prior written project approval of the CFMO, the USPFO, ARNG-ILI, and any other entity required by this regulation for a specific type project.

3-3. Project Development

Project development is one of the most important actions in MILCON programming and is documented using a DD Forms 1390/91. The DD Forms 1390/91, by itself, shall explain and justify the project to all levels of the Army, OSD, OMB, and Congress.

a. The State CFMO will review, validate, and prioritize the State MILCON facility requirements, including total authorized scope and unit strength (per NG PAM 415-12). To construct a Readiness Center you must have total authorized strength of 55 minimum for all units combined that are assigned to this type of facility. When it is determined that a facility shall be constructed or upgraded, the CFMO will prepare and submit DD Forms 1390/91, with all other applicable documentation. This will be accomplished using the PROJDOC DD Forms 1390/91 development tool.

b. ARNG-ILI shall validate each MILCON project by verifying the requirement that creates the need for the proposed project and confirming that the proposed project is the most cost effective means of satisfying the requirement.

c. Accurate project cost estimates are essential to successful MILCON project development and execution. Cost estimates must be closely scrutinized to ensure they are in-line with the OSD Pricing Guide. Project requirements will be captured as separate line

items under Primary or Supporting Facility cost and shall include contingency allowances, Supervision, Inspection, and Overhead (SIOH) and commissioning services. Detailed directions for completion of the DD Forms 1390/91 are contained in the annual ARNG MILCON Budget and Programming Guidance.

d. Demolition funded as part of a MILCON project shall be directly related to the project (e.g., in the footprint of the new construction or no longer needed as a result of the new construction).

e. Storm Water Management. Site development for all projects of 5,000 ft² or greater shall retain the pre-development site hydrology in accordance with EISA 2007 Section 438; referenced in UFC 3-210-10.

3-4. Unspecified Military Minor Construction Programming

Unspecified minor construction (UMMC) projects are authorized by *Title 10, United States Code, Section 2805, Unspecified Minor Construction*. Although individual UMMC projects are not separate line items in the budget; they require notification to congress before being considered for Federal funding.

a. Unspecified Military Minor Construction requirements should be unforeseen and so urgent that the project cannot wait for the MILCON POM Process. The State is to remember that a UMMC project is still a 2085 MILCON project and must follow the rules as such. Each project shall provide a complete and usable facility or improvement to an existing facility. Splitting requirements to keep project costs below the threshold is prohibited. An UMMC project shall not be accomplished concurrently with a MILCON project in the same facility. A UMMC project may precede a MILCON project for a new mission requirement when the UMMC will provide a complete and usable facility to meet a specific need during a specific time frame.

b. The CFMO will submit the project requests to ARNG-ILI-R in accordance with the instructions provided in the most current ARNG MILCON Budget and Programming Guidance.

Chapter 4 Budgeting

4-1. General

A project's Federal funding is based on the ARNG-ILI approved DD Forms 1390/91 for the project and is limited by congressional authorization and appropriation for the project and, if required, the availability of State funding.

a. Appropriations must be obligated within five years (FY+4). Any MILCON funds less than five years old may be used for in scope changes on any current MILCON project. Any MILCON funds older than five years and less than ten years old may only be used for in scope changes on the project for which the funds were originally appropriated. After 10 years, funds are not available for any purpose unless extended by Congress for their original intent.

b. Authorizations are good for three years (FY+2). If no obligations are made within this three year period a Congressional extension is required. Extension is for one year at a time with a maximum limit of two extensions.

c. Funding categories: The State shall use the following Army Management Structure Codes (AMSCO) for the following projects. No charge shall be made to the listed AMSCOs unless it specifically falls under the guidelines of the AMSCO.

(1) Code for each major construction project is project specific. Major construction project line item in budget is normally more than \$2,000,000. This includes construction supervision and administration (Title II or Type "C" services).

(2) Minor Construction: Specific projects at known locations with construction costs normally under \$2,000,000, executed as an exigent minor construction project. This includes construction supervision and administration (Title II or Type "C" services).

(3) Planning: Design of major and minor MILCON projects, soil testing, and consultant studies.

d. Design/supervision: An Architectural/Engineering (AE) professional services contract is authorized for State MCNG projects. The contract will be based on the ARNG-ILI approved project DD Forms 1390/91, which establish scope of work and cost estimates for State MCNG projects. The Federal reimbursement share of the AE contracts for MCNG projects assigned State design and construction agent responsibilities will be based on an amount not exceeding the estimated construction cost indicated in NGB's design authorization letter, or as later modified by ARNG-ILI in the MCCA design appendix.

4-2. President's Budget Submission to Congress

Each year, as part of the President's Budget Estimate submitted to Congress, budget books containing the details of each appropriation are prepared. These books are used by Congress to prepare Appropriation and Authorization legislation and reports. One of those books is the Military Construction Program for the Army National Guard. Once submitted to Congress, these books become publically available documents.

a. The Army National Guard Military Construction book is prepared by ARNG-ILI and reviewed/approved through the command chain including the Chief, National Guard Bureau, the Secretary of the Army and the Secretary of Defense.

b. The Army National Guard Military Construction book typically contains the following sections:

(1) Summary list of projects submitted for Appropriation and Authorization.

(2) Supporting forms, in the form of DD Forms 1390/91, detail each project submitted. The forms detail projects' scope and justification. If funded, deviation from the contents of the forms could have legal implications.

(3) Future Years Defense Program (FYDP). Some appropriations, including DoD reserve component Military Construction Programs, have been requested by Congress to publish an outline of its FYDP, along with changes from the previous FYDP and justifications for each change.

(4) Special Program Considerations. Formal communication of various issues related to the appropriation. Items in this section have included the following.

- (a) Comments (including project status) regarding issues outlined in Congressional Reports including directed design and directed minor construction.
- (b) Requests for scope changes for projects funded in prior years.
- (c) Requests for extension of authorization for projects authorized in prior years.
- (d) Summaries areas of compliance with laws, regulations and policies applicable to the program.

4-3. Authorized Charges

The relationship between ARNG Directorate and the State Military Department is that of a grantor and grantee as defined in 31 U.S.C. §§ 6301-6308. ARNG Directorate transfers funds to the State for NGB approved scope through a cooperative agreement, as detailed in Principal Assistant Responsible for Contracting (NGB-PARC) cooperative agreement directives, so that the States may construct facilities in support of the Federal mission of the ARNG to meet criteria established by ARNG Directorate.

a. *Construction of Non-readiness center facilities* to include logistical, aviation, training site facilities and others, located on either Federal or State land is 100 percent federally reimbursed when constructed in compliance with ARNG criteria.

b. *Readiness Center Projects Construction*

(1) Federal reimbursement for readiness center projects on State land is limited to 75 percent of allowable cost of construction, exclusive of land acquisition, which is a State responsibility.

(2) Costs for the construction of or additions/alterations to readiness center projects that are caused by Federally directed conversion, re-designation, or reorganization of units during force structuring can be supported with 100 percent Federal construction reimbursement.

(3) Costs for the construction of readiness center projects on Federal land are 100 percent Federally funded when Federal contracting procedures are used and land is licensed or permitted to the State from one of the DoD services or 75 percent if federal land is not licensed or permitted from one of the DoD services. Cost for construction is 75 percent Federal reimbursement when State contracting procedures are used on Federal land.

(4) Readiness center projects to be constructed on State owned land leased to the Federal Government will be considered State owned and will be limited to 75 percent Federal reimbursement.

c. *National Guard/Reserve Center Project costs* for the construction of reserve centers for joint use by the Army National Guard and units of one or more other reserve components are supported with 100 percent Federal construction reimbursement.

d. *Division of costs:* Items that are in excess of NGB authorization, and therefore not eligible for Federal reimbursement, may be included in a project if they do not substantially diminish the usefulness of the facility for National Guard purposes. Such items must be separately bid as alternates, or have a unit price bid, to establish the cost of the excess items. If the excess item is of a nature that separate bidding is not possible, the additional cost will be based on a predetermined calculation of the difference in cost of the item (or unit cost) and the cost of the quality or quantity authorized Federal support. Cost for excess floor area in a building (which cannot be bid separately) will be based on the average square foot unit cost of the building.

e. *Maintenance and repair:* NGB funding support from the MCNG appropriation is limited to new construction of facilities and the additions, alteration, conversion, and/or rehabilitation of existing facilities. Normally, the maintenance or repair of a facility will not be supported with MCNG funds unless specifically identified as part of the scope of work in the approved DD Forms 1390/91.

f. *Installed Building Equipment (IBE):* Installed-building equipment (real property) are items that are affixed or built into the facility and become an integral part of the facility. The cost for IBE is included in the costs of the primary facility and is not listed as a separate line item. For details and examples, see NG Pam 415-5 and AR 420-1 Chapter 4 Section VI. Personal property must be distinguished from IBE. Although potentially reimbursable with Federal funds and an integral part of the construction project, personal property is funded with other than MCNG funds.

4-4. Unauthorized Charges

a. *Incremental construction:* No requirement for a facility, or improvement to a facility, at a single location shall be subdivided into two or more projects (for construction in the same or succeeding years) to circumvent regulatory cost limitations or approval authorities.

b. Items in excess of NGB support (including excess energy consuming items) or to support non-DoD users of the project.

4-5. Military Construction Cooperative Agreement (MCCA)

This section describes procedures for the administration of the Military Construction Cooperative Agreements (MCCA) executed in conjunction with the Military Construction Army National Guard (MCNG) Program. For further information see NGR 5-1 (National Guard Grants and Cooperative Agreements) and the current MCCA from NGB-PARC (Principal Assistant Responsible for Contracting). If there is any discrepancy, the information on the MCCA from NGB-PARC supersedes all other references being the actual legal document and final authority. The MCCA is not considered an approved document until the final signature from ARNG-ILI Division Chief.

a. The state determines whether Federal or State contracting procedures will be used. An MCCA is required when State contracting procedures are used or if Federal contracting procedures are used on State-owned or State-leased property. Projects on Federal land, licensed or permitted to the state from one of the DoD services, using Federal contracting do not require an MCCA.

b. If an MCCA is required; it must be in effect prior to distributing any Federal funds.

c. Contribution of funds for State executed MCNG programs are authorized under Title 10, U.S.C. Chapter 1803. The program is formulated on the basis of MCNG design and construction requirements accomplished by State contracts and executed by a State contracting officer. This contract is subject to the regulatory policies established by NGB and Federal law and within authorized funding limits. In the event of a conflict between Federal and State law, NGB and Federal requirements may be amended or deleted to

conform to State law, but only after written approval has been obtained from the U.S. Department of Labor in the case of labor requirements, or from ARNG-ILI in all other cases.

d. The MCCA is composed of a basic model document with separate model appendices. Basic project types are listed below, some of which will require supplemental language to the appendices. Unique State conditions may also require modifications to the basic document. Such modified language must be approved by ARNG-AQ and may be a cause for delay in obtaining final approval.

(1) Readiness Center Projects on State Property: Federal reimbursement of both design and construction is limited to 75 percent of NGB approved scope.

(2) Readiness Center Projects on Federal Property: Federal reimbursement of both design and construction for readiness center projects on land that is licensed or permitted to the state from one of the DoD services is 100 percent of NGB approved scope when Federal contracting procedures are used. Readiness center projects on federal land that is not licensed or permitted to the state from one of the DoD services have the same federal reimbursement percentage as if the construction were on state owned land. If State contracting procedures are used, federal reimbursement is limited to 75 percent of NGB approved scope.

(3) Non-Readiness Center Projects on State or Federal Property: Federal reimbursement of both design and construction is 100 percent of NGB approved scope.

(4) National Guard/Reserve Center projects on State or Federal property: Federal reimbursement of both design and construction is 100 percent of NGB approved scope.

e. Funding the design of projects with a State share:

(1) NGB may agree to advance 100 percent design funds; if so the State will reimburse NGB its share at bid opening.

(2) The State may decide to use State funds for 100 percent design costs; if so NGB will reimburse the State its share at bid opening if it is put into the MCCA under pre-agreement costs. Federal reimbursement of state costs for design is contingent upon one or more of the following conditions being met:

(a) MILCON project is appropriated for construction

(b) Congress has directed project design

(c) Project is included in the Future Year Defense Plan

f. All MCCA MCNG supported facilities must be maintained and operated for its intended purpose for at least 25 years. As an exception to policy, ARNG-ILI may approve the use of MCNG funds for temporary or semi-permanent construction and may approve an MCCA for less than 25 years. ARNG-ILI will concur in such an agreement only if the State presents compelling evidence that an existing facility on State-owned or leased property cannot be rehabilitated sufficiently to increase its useful life to at least 25 years and that the requirement for an addition and/or alteration project is of such a critical nature that it cannot be deferred until a permanent replacement facility can be constructed. In these instances, the State must document the conditions of the existing facility and the critical nature of the requirement on the project's DD Forms 1390/91. ARNG-ILI will then determine the agreement period and the type of construction authorized based on its estimate of the remaining number of years of useful life of the existing facility.

g. The State may propose alterations or changes to one of the existing MCCAs. The State shall attach the complete statement of the approved alterations and changes, with justification, to the executed MCCA when it forwards the MCCA to ARNG-ILI for approval. Two copies of the MCCA agreement with original signatures and the date of execution to ARNG-ILI for concurrence will be part of the submittal.

h. Before concurrence, ARNG-ILI shall review the submitted MCCA for the following items:

(1) Use of current edition of proper MCCA.

(2) Proper calculation of cost sharing.

(3) Duration of agreement is not less than 25 years, unless ARNG-ILI has previously approved an exception.

(4) Properly written and approved changes and alterations to the standard format. If there are none, the MCCA must so state.

(5) Verification that Architect-Engineer services do not exceed 3 percent of the approved estimated project cost for Type A and Type C services (unless ARNG-ILI has approved otherwise) and that they do not exceed the statutory six (6) percent for Type B services.

(6) A properly annotated date of MCCA execution.

(7) Original signatures on both copies of the MCCA of the Adjutant General; the USPFO; signed certification by the State Attorney General; including any required signature delegation letters and copies of statutory signature delegation authorizations.

(8) Modifications will be accomplished using the Military Construction Cooperative Agreement (ARNG) Modification form shown in the latest version approved by NGB-PARC.

Chapter 5 Execution

Section I 5-1. General

It is the ARNG-ILI mission to construct high quality, sustainable, maintainable, long lasting, flexible, responsive, cost effective, new and replacement facilities for the Army National Guard on suitable land that is free from environmental hazards, within schedules that meet the needs of facility users, satisfy operational and training requirements, and attain and maintain compliance with Federal, State, and local environmental laws, codes, and regulations. During the execution phase, all projects are on the FYDP with validated programming documents (DD Forms 1390/91). The State CFMO has the lead role to design and construct MCNG projects with the support of the USPFO.

Section II Design Management

5-2. General

The project design year starts when DASA (IH&P) releases the projects to ARNG-ILI for design. ARNG-ILI will review the project programming documents (DD Forms 1390/91) for cost, scope and criteria compliance before issuing a design authority memorandum. This initial design authority memorandum gives the State CFMO and USPFO the authority to negotiate an Architect-Engineer contract for the preparation of the concept design. Other design directives will follow authorizing the project to proceed to the next design level; validating the project scope and cost in each level of submission, with special instructions for the design of the project. This process applies to all the MILCON projects (specified, unspecified, emergency, damaged or destroyed, and contingency construction).

5-3. Design Considerations

a. The NGR 415-10, NG Pam 415-12, and other technical publications will be used by the State for design development of applicable facilities. In absence of technical facility criteria, the current Uniform Building Code (UBC) will be used to complete the design. The States may request exceptions only to ARNG criteria. ARNG Directorate has no authority to waive the criteria in the UBC, or local building codes. However, the State must submit a certification of the local code in accordance with paragraph 5-11g(7) when the proposed design exceeds ARNG criteria.

b. MCNG planning and design funds (P&D) will be used for project design activities after issuance of the design authority memorandum until the award of the construction contract; including a design-build contract. This will include inhouse and AE activities associated with preparation and evaluation of the design-build RFP.

c. MCNG construction funds will be used for post-award project activities performed by the construction contractor and AE. Design-related activities performed by the design-build contractor will also be MILCON funded. Post-award design review costs will be a direct charge to MILCON funds. For certain projects, such as those accelerated by Congress, MILCON funds may be used for pre-award activities only where such activities are explicitly identified and associated costs specifically shown on the DD Forms 1390/91 funded as part of construction.

d. In the case of State contracted procedures, the CFMO (or State official) determines if they will utilize a unique AE selection or a pre-selected contractor, for instance an Indefinite Delivery Indefinite Quantity (IDIQ) contract. For Federal contracting, the USPFO shall select the source for the pre-design activities. These required efforts will begin when a design directive is received from ARNG-ILI. Unless otherwise directed, pre-design activities require the following documentation before beginning:

- (1) Approved DD Forms 1390/91 for the project.
- (2) Site surveys.
- (3) Site plans including Real Estate certification.
- (4) Preliminary subsurface investigation and analysis.
- (5) Preliminary utility investigation and analysis.
- (6) Narrative description of structural, electrical, mechanical, power, fire protection, and HVAC systems, and alternative energy systems to be considered.
- (7) A Construction Working Estimate (CWE) for budget purposes, which will be prepared if cost differs from that shown on the approved DD Forms 1390/91.
- (8) Environmental documentation indicating the site is suitable for construction. The CFMO will commence environmental documentation prior to submitting DD Forms 1390/1391 for the project.
- (9) Selection and negotiation of an AE contract.

e. To ensure that maximum functionality and usability throughout the design process the CFMO involves all facility users, functional proponents, and other appropriate State staff elements.

f. To ensure that the project complies with all statutory, regulatory, and code requirements, the CFMO will consult at each stage of the design with appropriate code officials and environmental, physical security, range safety, explosive safety, and occupational health experts and have them review the design documents.

g. The CFMOs ensure that the State Safety Officer submits such site plans through the National Guard Bureau's Army Aviation and Safety Division (ARNG-AVS) to the Department of Defense Explosives Safety Board (DDESB), as needed.

h. Preparation and contents of site plans will be in accordance with Preliminary and Final Site Submittal Checklist and Site and General Construction Plan Guide, USATCESP 385-02.

i. An industrial hygiene and occupational health technical review, as described in NG Pam 415-5, for surface and air maintenance facilities and indoor ranges.

j. The CFMO ensures that there is a common site reference point established and referenced on the designs for those projects where there are two or more AEs. In addition, all of the site designs will be accomplished using an equivalent scale.

k. The CFMO will verify all construction projects through an Archival Search Report the hazards and costs associated with UXO contamination. For details see NG Pam 415-5.

5-4. Types of Design Services

a. Title I, Type A. Field surveys and investigations required to obtain data that is essential to the performance of Type B services and that is not available from Federal or State government resources. These surveys and investigations may include topographical surveys; soil borings and other subsurface investigations; soils, chemical and mechanical surveys and investigations; determination of utility locations and capacities; and similar fact-finding investigations and technical studies at the approved project site. For Design-Build projects this type of service is used for the development of the Request for Qualification (RFQ) and the Request for

Proposal (RFP) to award the contract. This also may include 0.4 percent of pre-construction commissioning services.

b. Title I, Type B. The fee under any AE contract for services for developing plans and specifications is limited by statute to a maximum of six percent of the estimated cost of construction. The six percent statutory limitation applies only to production and delivery of designs, plans, drawings, and specifications for construction. On Design-Build projects, Type B services are not paid for with AE funding (except up to a one percent allowance to produce the RFP); they are programmed into construction costs. Some AE services are not considered an integral part of direct design services for a construction project and should be EXCLUDED from the AE fee when determining compliance with the six percent limitation. Examples are listed below:

- (1) Initial site visits.
- (2) Field, topographic, property, boundary, utility, and right-of-way surveys.
- (3) Subsurface explorations and borings, soils and materials testing, and resultant reports.
- (4) Flow gauging and model testing.
- (5) Reproduction of design documents for review purposes.
- (6) Comprehensive interior design (CID) services – to fund the design of Furniture, Fixtures and Equipment (FF&E), as part of CID, it must be included in the description of construction on the approved DD Forms 1390/1391 per UFC 3-120-10.
- (7) Preparation of general and feature design memoranda.
- (8) Models, renderings, or photographs of completed designs.
- (9) Construction phase services.
- (10) Preparation or verification of as-built drawings during construction.
- (11) The services of consultants not specifically applied to the preparation of designs, plans, cost estimates, drawings, or specifications for a project.
- (12) Preparation of general and development criteria not related to a specific construction project.
- (13) Management and contract administration of AE services contracts in connection with services excluded from the six percent limitation.
- (14) Document reproduction, travel, and per diem costs.

c. Title II, Type C. Construction supervision and inspection services, testing, shop drawing review, and management services including allowances for Supervision, Inspection, and Overhead (SIOH). This also may include 0.6 percent of post-construction Commissioning services. Type C services are part of primary facility construction costs.

5-5. Contracting for Design

a. The CFMO will determine whether a Federal or a State agent is utilized and may elect to contract for all AE services, to perform some of the services within the CFMO office, or to enter into an agreement with a State agency outside of the Military Department to be the contracting agent. When the standard procedures, agreements, or laws of a State require that MCNG projects be designed and their construction supervised by a State agency other than the Military Department; the State Military Department enters into a formal agreement with that agency. Although there is no standard format for the agreement, it will be reviewed and approved by the USPFO to ensure that its procedures are in consonance with the MCCA. The CFMO may request approval from ARNG-ILI to allow part of or all AE services to be performed with Construction and Facilities Management Office staff.

b. Whichever contracting agent the CFMO uses to begin a project (State or Federal) needs to remain the same throughout both the design and construction phases of the project. Exception to this will only be approved if the CFMO submits sufficient justification, which is reviewed and approved by ARNG-ILI.

c. For Federal contracts, the USPFO is usually the design and construction agent on MCNG projects executed under Federal procedures. However, if requested by the State, ARNG Directorate may delegate the responsibility to the Army Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), or the NGB Principal Assistant responsible for Contracting (NGB-PARC). All MCNG funds flow through the USPFO, except when NGB is the design and construction agent.

(1) A MCCA is required when a Federal design agent executes a project on State land, but is not required when a Federal design agent executes a project on Federal land.

(2) The CFMO prepares a concise and accurate project description to be used in the statement of work for both the design contracts. At a minimum the description must provide information on utility systems, existing structures that will be affected by the new project, facility user requirements, and a list of Government equipment to be installed.

(3) The CFMO prepares, signs, and dates a detailed cost estimate for both the design and the construction contracts and submit the same (and any required revised estimates) and assist the contracting officer in preparing AE performance evaluations when the FAR requires them.

(4) The CFMO schedules and conducts project AE criteria review conferences for all MCNG projects with a Federal design agent and provides technical support as requested.

(5) The AE selection will be in conformance with the FAR and its supplements. All AE contracts are to be fixed-price, and will contain the following:

- (a) The requirement for ARNG Directorate reviews as stipulated elsewhere in this regulation.
- (b) A design control cost as described in paragraph 5-5d (2) a below.
- (c) The stipulation as described in paragraph 5-5d (5) below.
- (6) When ARNG-ILI grants design authority, the CFMO will submit an NGB Form 86-R to ARNG-ILI for review and advance funding. Upon approval, ARNG-ILI allots funding for the estimated Federal share of Title I costs to the USPFO as an advance so that the contracting officer can negotiate an AE contract. Upon completion of AE negotiations, the CFMO submits an NGB Form 86-R to adjust Title I funding to the actual contract amount.

d. For State contracts, the following conditions apply:

(1) Services must be provided by a firm licensed to do business within the State as a registered architect or engineer and comply with State licensing requirements.

(2) The State may contract for AE services in accordance with NGB-PARC cooperative agreement directives and the MCCA (Appendix SD) on the NGB variable fee schedule, an NGB approved State variable fee schedule, or a lump-sum fixed-fee basis. A contract will include the following two clauses:

(a) A stipulation that the AE will revise plans at no cost to the State to stay within the design control cost or to correct errors in the design. This consists of a contract designated amount not to exceed the estimated project cost on the latest approved DD Forms 1390/1391. If the State selects the Army Corps of Engineers (USACE) or the Naval Facilities Engineering Command (NAVFAC) as the design agent and revisions to plans are required to stay within design controls or to correct errors in the design, the State may be required to pay additional design fees from State funds without Federal government reimbursement.

(b) A payment escalation clause, that in the case of a variable percentage contract, will stipulate that the contract amount is an estimated amount only and that final payment for all AE services are based on the lowest acceptable responsible bid under the construction contract. The clause will further state that if the State cancels the project prior to award of a construction contract, the AE only receives payment for Title I services. Payment is based on the lowest bid received, or, if no bids have been received, on the State Contracting Officer's determination, but in neither case to exceed the amount established in the AE contract.

(3) The State is liable for any AE fees that exceed the limits established in the MCCA, Appendix SD, as amended.

(4) Upon completion of its AE contract negotiations and establishment of a design schedule, the CFMO submits an NGB Form 86-R, the State's estimate, and a record of negotiations to ARNG-ILI for review and funding. Upon approval, ARNG-ILI allots funding for the estimated Federal share of Title I costs to the USPFO which will reimburse the State for the AE progress payments.

(5) ARNG-ILI will not normally consider a request for additional funds predicated upon AE work required to modify, change, or correct the project plans, specifications, or bidding documents to conform to ARNG-ILI design review comments on published criteria and construction standards.

(6) If ARNG-ILI approve changes in project scope, construction cost, and construction methods or details require the AE to accomplish Title I work above and beyond that normally required such that the escalation clause in the variable fee contract (or the amount of the fixed fee contract) will not adequately compensate the AE, the CFMO may negotiate a change to the original contract and submit an NGB Form 87-R requesting additional funds.

(a) For fixed fee contracts additional funds are limited to actual time and materials to be expended by the AE. ARNG-ILI approval is contingent upon CFMO justification that clearly itemizes the additional labor required by AE discipline and type of work and other materials required and expenses to be incurred.

(b) Any approval by ARNG-ILI will also require the State to submit a modification to the MCCA, if the increased costs will exceed maximum Federal funding limitation for design in Appendix SD.

(7) Upon award of a construction contract, the CFMO will modify the AE contract according to the payment escalation clause and submit two NGB Forms 86-R, the first form indicates the final fee due to the AE and the adjustment of funds between the final amount and the amount previously allotted to the State for Title I fees. (In the case of a fixed fee AE contract, the State will only submit a form requesting Title II funding.) After review and approval, ARNG-ILI allots additional funds or withdraws unnecessary funds from the USPFO for Title I and allots Title II funds. Any additional design changes required after construction has begun are paid for out of Title II funds.

(8) If changes in construction methods or details required by the contracting officer require the AE to accomplish Title II work above and beyond that normally required the State need to demonstrate that additional work effort is required by these changes. ARNG-ILI approves these changes; the CFMO may negotiate a change to the original contract and submit an NGB Form 87-R requesting additional funds.

(9) For the State to receive Federal funding for design, all of the following must occur.

(a) ARNG-ILI must have an approved a DD Forms 1390/1391 in writing within the past 12 months for the scope of the project. Any scope changes during the design must be notified to ARNG-ILI immediately to ensure compliance with the authorization. All design modifications requires ARNG-ILI approval before proceeding further.

(b) ARNG-ILI must have granted the State authority to proceed to design in writing. Federal reimbursement for design cost is not authorized if the State proceeds to the next design level without authority or without complying with prior NGB review comments before proceeding with design.

(c) There must be a fully executed Military Construction Cooperative Agreement (MCCA) for the project.

(d) The CFMO must have submitted, and ARNG-ILI must have approved, an NGB Form 86-R for design services.

e. Errors and Omissions. No matter what type contracting procedure is used for design, the AE is responsible for the technical competency, accuracy, and completeness of its project plans and specifications and is to be held accountable for any additional expenses and or lost work resulting from its errors and omissions.

(1) Under AE contracts, the AE is required to make necessary corrections at no cost to the Government when the designs, drawings, specifications, or other items or services furnished contain any AE errors, deficiencies, or inadequacies.

(2) No Federal funds are to be used to compensate the AE for additional design work or the construction contractor for construction costs incurred as a result of AE errors and omissions. State and Federal contracting agents will seek appropriate remedies under their applicable contracting procedures. However, this prohibition on additional Federal funds for construction costs as a result of AE errors and omissions applies only to the difference between what the project actually cost and what it would have cost had the AE not made the errors and omissions.

(3) In the case of State contracting agents, the State is liable out of its own, non-Federal, funds for any additional AE or construction costs that accrue as a result of improper guidance, direction, or oversight it provides the AE.

5-6. Design Submittals

a. The State proceeds at its own financial risk if it lets a design contract without ARNG-ILI design authority. The State CFMO will determine the most economical and effective means to design and construct ARNG facilities, including the selection of the project delivery system. Details about the design milestones compliance for design-bid-build and design-build delivery systems are explained throughout this section.

b. ARNG-ILI reviews for industry standard quality control measures. The intent is to ensure facility quality and adaptability and to reduce obvious design errors that increase either construction or operational costs and that reduce mission support. However, this is a quality control review and not a complete technical review, which remains the responsibility of the CFMO.

c. ARNG-ILI primarily conducts its reviews to ensure:

(1) The design is within the scope of the approved DD Forms 1390/1391.

(2) That features that are eligible for Federal construction support are differentiated from those not eligible for Federal reimbursement.

(3) That items that appear to exceed published ARNG criteria and construction standards must be covered by an approved exception to criteria, adequately justified, or may remain in the project without justification if supported with other than Federal funds.

(4) That items that do not conform to ARNG, NGB, DA, or OSD policies and/or are not supported by a life cycle cost analysis or will not meet Army energy goals are identified.

d. ARNG-ILI design reviews will not supersede State or local code. If the State desires Federal support for an item required by State or local code and normally considered excess to published ARNG criteria and construction standards, the CFMO signs and submits to ARNG-ILI a certified statement detailing the code applicability. For specific format to be utilized, consult NG Pam 415-5. States are encouraged to involve applicable code officials in justifying design components in dispute.

e. The CFMO submits the review documents to ARNG-ILI for comment and approval with a transmittal memorandum which certifies that the State has reviewed the documents prior to submission and a brief discussion of the steps the State will take to resolve the non-complaint items of the review. The review will not start until ARNG-ILI receives the complete submittal to include the transmittal memorandum. For details of the submission, see NG Pam 415-5.

f. At minimum, the design review process will cover the following areas:

(1) Cost – Project cost did not exceed the project programmed amount.

(2) Scope – Project scope is within the authorized area and items listed are authorized on the DD Forms 1390/91.

(3) Real Estate (License, Certificate or Lease).

(4) National Environmental Act and Environmental Condition of Property requirements.

(5) Physical (Anti-Terrorism/Force Protection) and Electronic Security Systems Requirements.

(6) Compliance with the latest Sustainable Design and Development Policy, the Department of Defense Sustainable Buildings Policy and the Secretary of Army's Energy Policy. Also all submissions will reflect the principles of sustainable design and development as enunciated in Executive Orders 13101 and 13123.

(7) Design and construction standards for the Building Envelope (heating, ventilation, and air conditioning; lighting; and service water heating) per ASHRAE Standard 189.1-2011 or any subsequent standard as articulated by the Department of the Army.

(8) Chief of Financial Officer Act compliance.

(9) Subsurface Investigation and Analysis.

(10) Functional Requirements (Maintenance, Training, Aviation), the CFMO must submit copies of the required approvals.

g. All design submittals, conceptual through final, will be submitted in half-size drawings. Cost estimates and specifications submittals will include a hard copy. Bid final drawings and specifications must include an electronic format. The State should coordinate directly with the ARNG-ILI-C Regional Facilities Management Engineer (FME) for the specific details.

h. Conceptual Design is submitted at approximately at the 30% point in the design process. Design will begin when the State receives the design authorization memorandum from ARNG-ILI and is based upon the compliance of pre-design activities. The design will be limited to the approved scope as shown on the DD Forms 1390/91. The State CFMO and ARNG-ILI will review each design submittal, assuring that the authorized scope on the DD Forms 1390/91 is not exceeded during design. The design will establish all basic features, materials, construction methods, facility systems, and related costs of the facility. This is a requirement for all MILCON projects.

i. The purpose of the conceptual design is to ensure early coordination at both the Federal and State levels and to clarify project requirements, criteria, and utility services. A conceptual design submittal may be considered for preliminary submission approval if the level and quality of detail of the submission meets the preliminary design requirements. Any changes required due to exceeding criteria, scope or costs identified at this level of design are still the responsibility of the AE to correct without additional compensation. The conceptual submittal requirements follow:

(1) Outline specifications.

(2) Current working estimate for budget purposes.

(3) Thirty-five percent design drawings, which includes:

(a) Project site plan.

(b) Area site plan.

(c) Complete subsurface investigation and analysis.

(d) Architectural floor plans that consider functional relationships, work area use, security requirements, and traffic flow patterns.

(e) Building sections.

(f) General interior finish selections including interior design concepts.

- (g) Exterior elevation drawings showing principal exterior finishes.
- (h) General preliminary mechanical, electrical, and information systems layouts, including equipment capacities and sizes.
- (i) Fire protection plan.
- (j) Exterior utility plans.
- (k) Electronic Security System infrastructure plan.
- (4) Basis of design, including the following:
 - (a) Design assumptions.
 - (b) Design analysis and calculations.
 - (c) Economic analyses.
 - (d) List of materials and methods of construction to be used.
 - (e) Information systems requirements.
 - (f) Discussion of types and capacities of HVAC systems, including a description of the selected system.
 - (g) Discussion of types and capacities of primary electrical power, conduit, information systems, lighting, and other systems considered, including a description of the selected systems.
 - (h) Descriptions of the foundation, including any special requirements such as drilled piers, pilings, and support facilities.
 - (i) Site analysis that discusses the opportunities and constraints of the site.
 - (j) Operability studies.
 - (k) Department of Defense Explosives Safety Board (DDESB) site approval, if required by AR 385–10.
 - (l) Hazard analyses, if required.
 - (m) Preliminary erosion control analysis.
 - (n) Preliminary landscaping planting plan and a plant material analysis that reflects the selection of plant material native to the project area.
 - (o) Life cycle cost analyses on the use of renewable energy.
 - (p) Building energy simulations, energy conservation studies, and design energy use calculations.
 - (q) Design submittals for DoD Minimum AT/FP compliance.
 - (r) Fire protection analyses.
 - (s) Corrosion mitigation plan.
 - (t) ARNG-AV review of all new range construction projects and validation that the surface danger zone (SDZ) has been properly mapped and applied in accordance with AR 385-63.

(5) Concept design is not complete until it incorporates all valid comments and is approved by ARNG-ILI. Refer to the most current ARNG MILCON Budget and Programming Guidance for submittal deadlines. The cost reported by the current working estimate, is reviewed, validated, and approved by ARNG-ILI prior to its submission to HQDA.

j. Preliminary Design is submitted at the 60% point in the design process and consists of plans, technical specifications, cost estimate, supporting design data, along with a transmittal memorandum from the CFMO that addresses each and every ARNG-ILI review comment from a prior review. The preliminary submittal will include all items required in the conceptual submittal further developed to the 60% point and updated to include refinements in the design identified during the conceptual review or in developing the preliminary design. Preliminary specifications will be in draft form and closely approximate the final specifications. This design will begin when the State receives the design directive from ARNG-ILI-C based upon the compliance with the conceptual design review comments. The State and ARNG-ILI will review each design submittal, ensuring that the authorized scope on the DD Forms 1390/91 is not exceeded during design phase. This is a requirement for all MILCON projects.

k. Once a project has obtained a preliminary design submission approval, no criteria changes that may be subsequently published may be incorporated into the design. The only exceptions are projects that have no authority to exceed that design level or projects that are not in a military construction budget already submitted or just about to be submitted to DA. In those cases, the States must make a formal, justified case for an exception. In other cases, the States may also request an exception if it can demonstrate that adhering to the original criteria would not negatively impact the readiness levels of the supported units or would not significantly increase the cost of construction.

l. Prior to or simultaneously with the preliminary design submission, the CFMO provides ARNG-ILI with the following documents.

(1) Site survey report. This report is for the actual location of the project, not for adjacent or similar locations, and will include laboratory results that classify, grade, characterize, and determine the strength of the surface land sub-soils for supporting building and pavement construction (i.e., Declaration of Soil Bearing Capacity). The report will provide recommendations on whether to use slab-on-grade or a foundation and what type of paving to apply.

(2) Environmental Condition of Property (ECOP). ARNG-ILI will not begin review of the preliminary documents without an ARNG-ILE approved ECOP that demonstrates that the project site meets the requirements stipulated in paragraph 2-4b.(10) above.

(3) Certificate of Title, dated within one year of its submission to ARNG-ILI-E. It will be in two originals, with the original signatures on both of the State Attorney General, his or her legal representative, or another State official specifically authorized by statute to certify title validity. However, ARNG-ILI-E may consider waiving this requirement until the submission of final design documents in the case of projects requiring a license, if the State can demonstrate that it has a legally binding right of entry to the project site.

(a) The State will have fee simple interest in the property or a lease interest that is not revocable with a firm term or right of renewal for a minimum of 25 years, unless there is compelling reason for a lesser period. The legal description in the title or lease places no restrictions against ARNG use for construction, administration, operations and training or to Federal government use in time of war or national emergency. Any lesser period requires approval of ARNG-ILI.

(b) If the property is on Federally owned land, the State submits two copies of its license, which provides for at least a 25 year interest, unless there is compelling reason for a lesser period. Any lesser period requires approval of the Assistant Secretary of the Army (Installations, Energy and Environment).

(c) If the project is on the same tract of land as a previous MCNG project, then the State submits a certificate stating only that no transactions have been recorded for the described tract since the date of the original certificate. This certificate has the same signature and signature validation requirements as an original Certificate of Title and references the MCCA or Federal/State Agreement of the original project and the current MCCA or Federal/State Agreement. However, in the case of projects on the same tract of land as a previous MCNG project where the State only holds a lease or license interest, the State must demonstrate that it has at least a remaining 25 year interest from the estimated date of construction completion.

(4) The CFMO will submit appropriate proof that the State has complied with applicable requirements of the National Environmental Policy Act (NEPA) (42 U.S.C. §§4321-4370a), National Historic Preservation Act (16 U.S.C. §470 et. seq.), Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C., Chapter 103), the DA Sustainable Design and Development Policy (see UFC 1-200-02 High Performance and Sustainable Buildings Requirements) and other environmental requirements. See AR 200-1 and 32 CFR Part 651 for details. The documentation will contain an ARNG-ILE approved Record of Environmental Consideration, Finding of No Significant Impact, or Environmental Impact Statement. In addition, if there is a potential for the project to be considered an undertaking (as defined in 36 CFR 800.16(y) on a historical property (as defined in 36 CFR 800.16(1)(1)), the State must provide proof of concurrence from the State Historic Preservation Office (SHPO). Failure to do so can result in a Letter of Foreclosure from the Advisory Council on Historic Preservation to the Secretary of the Army. Additionally, NEPA funds will not be made available until the project is on the FYDP.

m. A preliminary design submittal could be validated as a final design submittal at the discretion of ARNG-ILI-C if the level and quality of the submission is sufficient to satisfy the final submittal requirements.

n. Final design is submitted at approximately the 90% point in the design process. This level of design is authorized after a project complies with the preliminary design review requirements. Final review documents will explicitly describe the quantity and quality of work to be performed by the construction contractor. This description will be of such quality in such detail that a qualified contractor can build a complete and usable facility suitable for the purpose intended, without recourse to subsequent contract modifications or changes (assuming no user directed changes and any AE errors and omissions).

o. Prior to submission, the CFMO in conjunction with the appropriate environmental, range safety, explosive safety, and occupational health experts, examine the design documents from the AE for completion. They should pay special attention to possible omissions of authorized items, threats to environmental protection, and violation of safety and occupational health requirements.

p. The CFMO shall review the documents prior to submitting to ARNG-ILI to ensure that the submission is in accordance with the ARNG-ILI comments on the preliminary submission, the scope in the approved DD Forms 1390/1391, and the generally accepted construction standards in the appropriate Design Guides. The CFMO shall certify in the final submittal memorandum that the State has complied with this requirement.

q. The CFMO ensures that the contracting officer does not solicit bids until ARNG-ILI approves the final review documents and authorizes that the project be bid. The State is liable for all additional costs incurred as a consequence of soliciting bids for construction prior to ARNG-ILI granting bid authority.

r. Prior to or simultaneously with the final design submission, the CFMO provides ARNG-ILI with the following additional documents.

(1) Appendix SC of the MCCA, unless the CFMO submitted it with the MCCA at the time ARNG-ILI issued design funds. Those States who had a Federal/State Agreement approved prior to the adoption of the MCCA may use that document. This requirement does not apply to projects with a Federal construction agent.

(2) The CFMO will either certify that no change has occurred in its environmental documentation or it will update the documents submitted with the preliminary design package.

s. ARNG-ILI will issue bid authority when the Final Design is approved, stamped by the designer of record; major issues are resolved; all required documentation and certifications are submitted; and funding is available. The Chief of ARNG-ILI may grant an exception in cases where no MILCON funds are authorized by Congress. Such exception shall be solicited as "Subject to Availability of Funds (SAF). No other exceptions are allowable.

t. Bid Finals - Prior to soliciting bids, the CFMO submits 100% bid final, drawings and specifications in CD form.

(1) This submittal includes all of ARNG-ILI's comments on the final review submission and will be identical to the documents that will be issued to prospective contractors.

(2) The CFMO ensures that an architect and/or engineer(s) licensed to practice within the State stamps or otherwise certifies the final construction drawings and includes the necessary plans, elevation, sections, schedules, and notes, to include the material submittal requirements (required for Federal contracts).

u. Concurrent with the submission of the bid final documents, the State submits the following:

(1) A draft DD Form 1354 itemizing by real property category code all construction that the AE shows as taking place. Without this document, ARNG-ILI will not issue construction dollars.

(2) Certification that the environmental documentation, including the compliance of applicable sustainability policies and the Certificate of Title are all still current and valid and that any required matching funds are currently available.

v. ARNG-ILI will review the bid final documents to determine conformance with final review comments. If it finds items in excess of authorization that have not been properly annotated as additive or alternate bid items, it coordinates with the State to resolve the issues and, if necessary, determine a reasonable cost for the items and deduct that amount from the amount issued to the USPFO to reimburse the State during construction.

w. The bid final documents become the final, auditable record of the project as bid for both the State and ARNG Directorate.

x. Design-Build Procurement. Projects planned for execution as design-build will be identified as early as possible, preferably at the time the project is submitted for the LRCP. Further, the opportunity to make changes to a design-build contract will be severely limited after contract award. After contract award, all discretionary (user-requested) changes, including those that affect the contractor's design, must be approved by ARNG-ILI-C. For this type of contract:

(1) Planning and design funds (P&D) will be used for project activities after issuance of a design authority until award of a design-build contract. This will include in-house and AE activities associated with preparation and evaluation of the Requests for Qualification (RFQ) and Requests for Proposal (RFP).

(2) MCNG funds will be used for post-award project activities performed by the construction contractor and AE. Design-related activities performed by the design-build contractor will also be MILCON funded. Post award design review costs will be a direct charge to MILCON funds.

(3) ARNG-ILI conducts two reviews prior to granting authority to issue the design-build RFP. These reviews will cover the same criteria of a Design-Bid-Build project (scope, cost and criteria) and in accordance with current, accepted practices for design-build RFPs. The State is encouraged to incorporate Design Build Institute of America (DBIA) best practices, where practical and in compliance with State law and Federal policies (see Appendix A, References).

(a) The State will submit the draft RFP for review with any applicable bridging documents. ARNG-ILI will review the draft RFP documents to assure the project conforms to and does not exceed the approved project scope, and budget; and includes all applicable criteria.

(b) ARNG-ILI-C will review final RFP documents to assure the project conforms to the approved concept requirements for functionality, operability, and maintainability; and that any corrections identified during the draft review have been incorporated into the final.

(c) To receive approval to award the design-build contract, the State must submit the final negotiated price for the selected proposal, the record of negotiations or basis of award, and the selected proposal. After the compliance with these conditions ARNG-ILI will grant the State authority to award the design-build contract.

(4) After contract award, ARNG-ILI will review the design at 50 percent design completion stage to ensure criteria compliance; the State cannot start any construction activity until ARNG-ILI approves the 50 percent submittal. ARNG-ILI has the option to provide comments to the States; however, time for ARNG-ILI design review will not be included in the project schedule. The ARNG-ILI design review will focus on the whether the design accurately complies with the criteria in the contract RFP and any associated bridging documents. If the design has serious issues or does not adequately address all required criteria items, ARNG-ILI may reject the submission completely or conditionally accept it, requesting further information or submissions per ARNG-ILI guidance and discretion.

(5) The design-build contractor is responsible for correcting any errors or omissions in the design and adjusting their internal schedule to accommodate those corrections at no additional cost to the State or Federal government.

(6) Construction Phase. Once ARNG-ILI has reviewed and accepted the design, it will issue authority to proceed with the construction phase of the contract. All technical issues are the responsibility of the State and their design-build contractor.

(7) NGB does not encourage the use of fast tracking as it increases the labor requirements for more reviews (site work phase and vertical construction phase). However, there may be times that fast tracking is needed to meet mission schedule. If fast tracking is anticipated for any given design-build project, the State must coordinate this closely with ARNG-ILI.

(8) For Firing Range Projects a design-build delivery method is restricted only to range projects that will accommodate a full SDZ without modification or waiver as determined during the course of a planning charrette to develop the DD Forms 1390/91. Also, the final RFP will include a preliminary SDZ analysis that demonstrates compliance with criteria based on a conceptual site plan of the range layout including firing points. See NG Pam 415-5 for more details.

(9) For Manufacturing, Storing, Handling, Transporting, or Testing Military Explosives or Ammunition, and Demolition Ranges a design-build delivery method may NOT be applied in the acquisition of these facilities. Such projects require DDESB approval based on the design of the project and are therefore not candidates for the design-build delivery method.

y. Construction Manager at Risk (CMAR). CMAR is a delivery option that is a variant of the Design-Bid-Build (DBB) giving the owner some benefits of the Design Build option. The CMAR is also referred to as Construction Manager General Contractor (CMGC).

(1) The CMAR/CMGC delivery method retains a separate A&E contract by the owner, with the owner still assuming risk for design errors. All the design reviews of CMAR/CMGC are required as they are for DBB prior to actual construction. The CMAR/CMGC method is best suited for large construction and/or renovation projects that are schedule sensitive or have budget concerns.

(2) The CMAR/CMGC is awarded based on a best value selection with the construction manager (CM) assuming risk by providing a guaranteed maximum price (GMP) to build the project within the programmed amount (PA). To achieve the greatest benefit bring on the CM prior to design initiation. The CM becomes a partner with the owner and the A&E during the design to insure the PA for construction is not exceeded by the design. It is beneficial to wait until the later portions of design (90%) to execute the GMP. The CM provides preconstruction services which include constructability reviews, value engineering solutions, and cost estimates during the design process. The CM preconstruction services during the development of the bid package by the A&E are paid out of Type A funds.

(3) The CM may not award subcontracts until such time as construction authority is granted to the State from ARNG-ILI. When ILI grants the construction authority; the State may award the construction contract(s) and obligate the project funds, reporting the project as executed. At this time, this method is not an approved delivery option for Federal Contracting by the PARC Office.

Section III

Construction Management

5-7. Pre-Award Requirements

a. Appropriate interests in real property will be obtained before bids are advertised or construction contracts are awarded (see AR 405–10).

b. When the contracting officer has completed the bidding process and selected a recommended contractor(s), the CFMO submits the following documents to ARNG-ILI for review and approval of the appropriate level of Federal reimbursement:

(1) NGB Form 86-R (initial or adjustment, depending on whether the project has a State or a Federal construction agent) for each proposed contract.

(2) A copy of the bid abstract.

(3) A copy of the bid(s) of the successful low bidder(s).

(4) A copy of the contract for construction, if State contracting procedures are used and the Payment by Reimbursement is selected, within Article V Payments of the executed MCCA.

(5) Bid Results and Award Recommendations Memorandum. When the bids received exceed the estimated construction cost of the project, the CFMO shall prepare a "Bid Results and Award Recommendation" memorandum that summarizes the bid results and bidding climate/history, identifies the low bidder and provides a recommendation for award along with an analysis of the costs as a percentage above the programmed amount. This recommendation shall also include a discussion of the additive bid items or bid options being requested for funding, and discussion of any additional State dollars that can be added to the project. It should also describe any MCCA modifications that may be required.

c. Additive Bid Items and Bid Options - Non-essential additive items or bid options could be deferred if the bids are not favorable. Additive bid items and bid options may only include scope items described in the DD Forms 1390/91 and will under no circumstances include primary facility items require for a complete and usable facility.

d. During advertising, bidding, awarding, and construction of a MILCON project, it may be impossible to award all additive bid items or bid options related to a project. This occurs when statutory limitations are reached, when items are prohibitively costly, when the appropriation is critically short of contingency funds, or for other reasons.

e. As a process to mitigate risk, 15 percent of maximum construction limit shall be identified as an additive bid items or bid options to be included in a solicitation during the preliminary design submittal.

f. Title 10 USC 2853 directs that any reduction in scope of more than 25 percent requires formal Congressional notification. Additive bid items or bid options that are part of a solicitation that impact scope must not total more than 25 percent of the authorized project scope without approval by HQDA (DAIM–OD).

5-8. Contract Award

a. Funds sufficient to cover the cost of the contract, contingencies, engineering during construction, as-built drawings, and supervision and administration must be available at time of award.

b. A State should not advertise a construction project and solicit bids without receiving written authority from ARNG-ILI. Failure to have this approval may subject the State to financial risk. Such authority is normally part of ARNG-ILI's written approval of the bid final review documents.

c. The CFMO ensures that the contracting officer does not award a project until ARNG-ILI has accepted the CFMO's bid package and approved the amount of Federal support authorized for that package.

d. Federal projects follow the procedures of the FAR and supplements, State projects follow State contracting procedures. For Federal projects, the CFMO submits NGB Form 86/87-R twice, once for ARNG-ILI to issue an advance to the USPFO and the second time to adjust the construction costs based upon the actual proposed contract (or change order) award. In State contracts, the CFMO submits the forms only once, at the time of award.

e. Savings realized from favorable bids (for example, lower than expected bids, quantity under-runs, invalid claims) will be used at the discretion of ARNG-ILI to fund shortfalls in the MILCON program.

f. Since MILCON cost estimates provided in the Congressional Justification Books are based on less than 100 percent design, the Congress allows the Services certain flexibility to approve cost increases. Per 10 USC 2853, a Service Secretary can approve a cost increase if the cost increase is not the result of an increase in the authorized scope. (Note that there is no authority under the law for the Services to increase the scope of any project approved by Congress.) The flexibility to increase the cost of a project is generally contingent on the availability of savings from other projects such as, bid savings or cancellations, and is only approved up to 125% or \$2.0 million (whichever is less) by the Chief of Installations Division.

5-9. Supervision and Inspection

a. During the project concept phase, the CFMO requests from ARNG-ILI appropriate additional resources to support construction agent responsibilities with supervision and inspection services. The CFMO will justify the need for Title II services in an AE contract.

b. The CFMO includes appropriate members of the Adjutant General's staff in construction progress inspections to ensure that the completed projects meet environmental, safety, occupational health, building code, and other statutory and regulatory requirements.

c. On Federal projects, the construction agent determines the CFMO's responsibilities. Because these are governed by the FAR and its supplements and any appointment as COR, they are beyond the scope of this regulation. Nonetheless, the construction agent, at minimum, conducts a midpoint and final inspection of the project and record these on the project's NGB Form 593. This normally is the contracting officer's Technical Representative, usually a member of the CFMO's staff.

d. On State projects, the Adjutant General is responsible for the inspection and supervision of MCNG projects.

(1) All projects are to be inspected as they progress through each phase of construction to ensure the project is in conformance with the contract drawings and specifications.

(2) All inspections include at least two parties: a representative of the Adjutant General who is not a Federal employee, and the USPFO or CFMO (if designated the Assistant USPFO for Real Property).

(3) The results of the midpoint and final inspections are recorded on the project's NGB Form 593. The midpoint inspection report ensures that the progress and quality of construction is in conformance with the terms of the contract and is retained by CFMO. The final inspection report verifies that project is complete without any exceptions and is ready for acceptance by ARNG Directorate and the State which is submitted to NGB after completion of the project (see para 5-13 below).

5-10. System Commissioning

Individual operating systems testing to ensure that contractual requirements have been met are not always an adequate process to guarantee overall performance. For projects which include various large, complex, or interactive utility systems, where significant operational degradation may occur, it may be necessary to ensure that the design intent has been accomplished through the use of the systems commissioning process. The commissioning process will help ensure systems function as required in critical facility processes and in life, health, or safety features of the project. The CFMO will identify and justify, in the project DD Forms 1390/91, all such requirements and program all funds necessary to implement this process, including any required MCNG funds.

5-11. Contract Modifications

a. The approved DD Forms 1390/91 serve as the validated and approved scope and cost of the project. An appropriation above this amount is not itself justification for contract modifications.

b. ARNG-ILI approves contract modifications for changes in construction contracts that execute modifications under the changes clause and increase or decrease the Federal cost of a project only if these modifications are in the best interest of the Federal government. Failure to get this approval may subject the State to financial risk.

c. Upon award of a construction contract, the CFMO submits an NGB Form 86-R to ARNG-ILI to request Title II funding. After review and approval, ARNG-ILI allots Title II funds.

(1) ARNG-ILI approval is contingent upon CFMO justification for the additional labor required by AE discipline and type of work and other materials required and expenses incurred.

(2) ARNG-ILI will not normally consider a request for additional funds predicated upon AE work required to modify, change or correct the project plans, specifications or bidding documents to conform to ARNG-ILI design review comments on published criteria, construction standards, etc.

d. ARNG-ILI will not approve increases or decreases in the Federal cost of a project when they incorporate additional features, improvements, alternations, modifications, etc. unless these changes satisfy one of the following conditions.

(1) Conform to NGR 415-10, NG Pam 415-12 or other ARNG, NGB and DoD policies and directives.

(2) Is the most economical solution.

e. Additionally, contract modifications must satisfy all of the following conditions.

(1) Sufficient funds are available to cover the cost of the modification.

(2) Does not exceed or substantially modify the scope of work as approved in the DD Forms 1390/91.

(3) Is for facility components approved by ARNG-ILI.

(4) Is not more advantageously accomplished by a separate, competitively bid contract.

(5) Is not beyond the scope of the change clause and overall scope of the construction contract.

(6) The cost of the proposed agreement is reasonable.

(7) The project's appropriation must not be expired. However, if the appropriation has expired but has not canceled, the contract modification may be approved if all of the following conditions are satisfied. For details on appropriation limits see para 4-1a.

(a) It must be for an item within the scope of the original contract.

(b) The request form must so state this and include the certification of either the USPFO or the contracting officer (in the case of a Federal construction agent) and name, title, and telephone number of the legal counsel or contracting officer making this determination. This is known as a "Dead Money Statement".

(c) There must be sufficient expired funds available at ARNG-ILI that was not expired at the time the original contract was let.

(8) The proposed agreement must be for items not previously supported with other than MCNG funds.

f. Any item or functional space funded at less than 100 percent Federal reimbursement in the original construction contract uses the same reimbursement rate in the contract modifications. As an exception, if the contract modification includes items not authorized Federal reimbursement or authorized less than full reimbursement, then the amount of Federal reimbursement is to be reduced accordingly.

g. ARNG-ILI will not approve construction contract modifications unless the State agrees to support all costs that are not eligible for Federal reimbursement. These consist of:

(1) Work previously supported 100 percent with other than Federal funds and not approved by ARNG Directorate.

(2) Work already started or accomplished by the contractor without prior notice to and formal approval by ARNG-ILI.

(3) Obligations incurred by the contracting officer not approved by ARNG Directorate or not in conformance with contract provisions.

(4) Modification or correction of construction required as a result of AE error or omission.

(5) Costs for additive changes considered by the approval authority to be unreasonable for the work to be accomplished or credit for deductive changes considered by the approval authority to be insufficient for the work to be deleted.

- (6) Work exceeding the approved project scope.
- (7) Work not in conformance with ARNG, NGB and DoD criteria, standards, and policies, unless supported by an approved exception to criteria or a CFMO code certification waiver.
- (8) Work or costs that exceed ARNG Directorate approval authority.
- (9) Changes that the approval authority judges to be not in the best interest of the Federal government.

h. USPFO approval limit.

(1) The USPFO has the authority to approve individual contract modifications that do not exceed \$25,000 in Federal share. The aggregate of contract modifications that a USPFO may approve per project, net of deductive agreements, may not exceed 2.5 percent of the validated Federal share on the approved DD Forms 1390/1391. For projects less than \$1 million in Federal share the USPFO may approve up to \$25,000 in supplemental agreements.

(2) In approving these contract modifications, the USPFO is acting for ARNG Directorate in approving the agreements as to scope and cost and certifying that they are in the best interests of the Federal government under the terms of paragraphs 5-11b through 5-11g(9) above. This does not relieve the USPFO of the requirement to verify, with ARNG-ILI, that the proposed modification is supportable for Federal reimbursement and sufficient funds are available prior to final negotiation and before issuing contract modifications.

(3) The USPFO may not delegate this authority to any other person.

(4) The State will not increment or subdivide contract modifications to remain within the USPFO approval limit.

(5) All changes during negotiations, even if no changes in cost, require change orders documented on 87-Rs.

(6) Details of processing these agreements are in NG Pam 415-5.

i. Contract modifications beyond USPFO authority.

(1) ARNG-ILI reviews and analyzes the CFMO's request for a contract modification via telephone or other electronic means and conveys ARNG Directorate's approval or disapproval for the contracting officer to start formal negotiations with the contractor.

(2) Upon successful completion of negotiations, the contracting officer will work with the CFMO to prepare the following documents for ARNG-ILI review, approval, and funding.

(a) Checklist for Processing Contract Modifications. (See NG Pam 415-5.)

(b) NGB Form 87-R.

(c) Contracting officer's Description of Modification.

(d) Contracting officer's Justification Data.

(e) Contracting officer's Cost Estimate.

(f) Report(s) of Negotiations. (Not required for unilateral contract modifications.)

(g) Contractor's Proposal. (Not required for unilateral contract modifications.)

(h) Statement of Legal Sufficiency, provided by State National Guard Staff Judge Advocate, an attorney in the Attorney General's office, or by other competent legal authority authorized to review State contracts. (This does not apply when there is a Federal construction agent.)

j. Contract modifications not requiring Federal funds.

(1) The CFMO may approve and execute without ARNG-ILI approval contract modifications that do not require Federal funding support or that delete items previously supported with Federal funds. As an exception, if the project scope changed in any way and the work is not in conformance with ARNG, NGB and DoD criteria, standards, and policies, then approval must be obtained from ARNG-ILI that the proposed modification is supportable for Federal reimbursement and sufficient funds are available prior to the contract modification being issued (remember the 13901/91 is the scope of record and is a fiscal limitation; it cannot be exceeded regardless of cost).

(2) Change orders need to be done even if no cost, particularly if scope is altered during negotiations with the contractor.

(3) Should the potential change order have additive scope items not previously authorized by ARNG-ILI at time of award or combined with deductive scope results in a net of no cost or deductive cost as a result of the modification, the USPFO/CFMO are not absolved of the requirement to verify with ARNG-ILI that the proposed modification is supportable for the contract modification to be issued.

(4) The CFMO will submit a copy of the agreement and an NGB Form 87-R to ARNG-ILI for recordkeeping purposes. No backup or justification material is required.

k. Unilateral contract modifications.

(1) The CFMO ensures that the contracting officer does not provide the contract modification to the contractor until after ARNG-ILI has issued funding to the USPFO.

(2) If a dispute over the contract modification leads to a board of arbitration, court of law, or other legal mechanism awards the contractor a claim, the CFMO forwards a copy of the documents resolving the claim and an NGB Form 87-R to ARNG-ILI. ARNG-ILI, in consultation with NGB-JA, makes a final determination on the issuance of funds to the USPFO to support Federal responsibilities under the claim.

5-12. Beneficial Occupancy

a. Beneficial occupancy, or substantial completion, is the stage of the project when the construction is sufficiently complete according to the contract documents that the contracting agent can allow the users to occupy the facilities for their intended use. This date of beneficial occupancy or declaration of substantial completion is documented as the placed-in-service date. The CFMO will prepare an interim DD Form 1354 to be accepted prior to the day the user beneficially occupies the premises. The abovementioned certification starts the 25 year agreement (for projects with an MCCA/FSA).

b. The contracting agent will not allow occupancy until there is an approved Certificate of Substantial Completion (or memorandum of beneficial occupancy in the case of projects that use Federal contracting procedures) that establishes the responsibilities of the contracting agent and the contractor and fixes the time within which the contractor completes the remaining items in the project.

c. Upon payment of all invoices and settlement of all change orders with the contractors, the CFMO will update the interim DD Form 1354 to add the final cost of each facility constructed or capital improved in the project and make any other updates to the interim. The placed-in-service date must remain the same as in the interim. The Real Property Accountable Officer (RPAO) must then accept the final DD Form 1354 and the sum of the costs for all facilities should equal the sum of all the contract costs on the NGB Form 593.

d. Once a MILCON project is complete and usable, execution of follow-on construction projects using other than MILCON appropriations may proceed. There is no required waiting period. However, each such follow-on project must address a newly identified requirement, to preclude project splitting or incrementing, which would be a violation of the Military Construction Codification Act, 10 USC 2801 et seq.

5-13. Acceptance and Project Closeout

a. Physically complete MCNG projects will be accepted by the RPAO on a DD Form 1354.

b. Fiscal closeout of the project should occur within 60 days after physical completion including the submittal of the NGB Form 593. Fiscal closeout may be delayed by pending changes and claims.

c. A completed and approved NGB Form 593 certifies that the project is complete without exception according to the approved plans, specifications, criteria, and standards and that the constructed facilities are ready for full user occupancy.

(1) All contracts design and construction contracts have been fully completed and terminated with an accounting of the total Federal funds disbursed for each contract.

(2) The date of final completion and satisfaction of all outstanding contracts, including contract modifications.

d. The two signatories on the NGB Form 593 must actually perform the inspection for the acceptance of the project jointly on behalf of the State and the Federal government.

e. After the USPFO verifies and approves the information on the NGB Form 593, the CFMO mails a copy to ARNG-ILI, retains a copy, and provides the original to the USPFO.

f. At the time of fiscal closeout of the project, the CFMO updates the interim DD Form 1354 to reflect quantities and cost of the actual construction.

5-14. Payments

a. The USPFO reimburses the State on projects with a State construction agent and pays the contractor progress payments on projects with a Federal construction agent, as based upon receipt of contractor's invoice and certification of work completed. The contracting officer provides this certification for Federal projects and the Adjutant General or other delegated official will provide the certification for State projects.

b. The USPFO retains the appropriate funds (as determined by the FAR or the appropriate State contracting procedures) until the contract is complete and an NGB Form 593 certifies such completion.

c. Final payment.

(1) The USPFO makes final payment for Federal projects in conformance with the FAR and supplements upon receipt of the completed NGB Form 593 and the contracting officer's certification that all work required by the contract has been completed without exception.

(2) The USPFO makes final payment for a State contract only upon receipt of the completed NGB Form 593 and the USPFO's approval of the form. In the case of a project with multiple State contracts, the USPFO will make final payment after the work of all contractors has passed inspection, or, upon request of the State, separately after each contractor's work has passed inspection. In the latter case, the State submits a separate NGB Form 593 for each contract and consolidates the information on the final NGB Form 593.

Appendix A
References

Section I
Required Publications

AR 1-1

Planning, Programming, Budgeting, and Execution System (Cited in para 1-4d)

AR 200-1

Environmental Protection and Enhancement (Cited in paras 2-4e, and 5-6l(4))

AR 385-10

The Army Safety Program (Cited in para 5-6i(4)(k))

AR 385-63

Range Safety (Cited in para 5-6i(4)(t))

AR 420-1

Army Facilities Management (Cited in para 4-3e)

The ARNG Real Estate Manual

(Cited in para. 2-3)

The Army National Guard Bureau Environmental Condition of Property (ECOP) Handbook

(Cited in para 2-4a)

ARNG MILCON Budget and Programming Guidance (Annual)

(Cited in para 2-2a(7), 2-2b, 2-2c, 2-5a, 3-1, 3-3c, 3-4b, 5-6i(5))

Assistant Secretary of the Army (Installations, Energy and Environmental) Memorandum 16 December 2013

Sustainable Design and Development Policy Update (Cited in paras 5-6f(6), and 5-6l(4))

DA Pam 415-3

Economic Analysis: Description and Methods (Cited in para 1-4n(3))

DA Pam 415-28

Real Property Category Codes.

DA Pam 420-1-2

Army Military Construction and Nonappropriated-Funded Construction Program Development and Execution

Deputy Secretary of Defense Memorandum 17 November 2002 (supersedes Memorandum 13 September 1990, amended 1 December 1994) Land Acquisition and Leasing of Office Space in the United States

DoD 1225.07

Reserve Component Facilities Programs and Unit Stationing (Cited in para 1-4b)

DoDI 1225.8

Programs and Procedures for Reserve Component Facilities Programs and Unit Stationing

DoD 4165.06

Real Property

DoDI 4165.71

Real Property Acquisition (Cited in para 2-3d)

Engineering and Construction Bulletin 2003-8 (Rev 1)

DD Form 1391 Preparation Planning Charrette Process (Cited in para 2-5d)

Executive Order 13101

Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (Cited in para 5-6f(6))

Executive Order 13123

Greening the Government Through Efficient Energy Management (Cited in para 5-6f(6))

Assistant Secretary of the Army, Installations, Energy and the Environment (ASA-IEE)

Policy of Energy, Sustainability and Leadership in Energy and Environmental Development (LEED) Policy, Oct, 2013

Military Construction Cooperative Agreement

(Cited in paras 1-4m(1), 1-4m(3), 4-5, and 5-5d(9)(c))

NG Pam 415-5

Army National Guard Military Construction Program Execution (Cited in paras 4-3e, 4-5f(8), 5-3i, 5-3k, 5-6d, 5-6e, 5-6x(8), 5-11h(6), 5-11i(2)(a))

NG Pam 415-12

Army National Guard Facilities Allowances (Cited in paras 2-4b(8), 3-3a,5-3a, 5-11d(1))

NGR 5-1

National Guard Grants and Cooperative Agreements (Cited in paras 4-5)

NGR 405-80

Army National Guard Program

NGR 415-10

Army National Guard Facilities Construction (Cited in paras 5-3a and 5-11d(1))

USATCESP 385-02

Site and General Construction Plan Developers Guide (Cited in para 5-3h)

Uniform Building Code

(Cited in para 5-3a)

UFC 1-200-02 High Performance and Sustainable Buildings Requirements, (Cited in para 5-6 l(4))

UFC 3-120-10 Interior Design (Cited in para 5-4b(6))

UFC 3-210-10 Low Impact Development (Cited in para 3-3e))

UFC 4-010-01 DoD Minimum Antiterrorism Standards for Buildings

UFC 4-010-02 DoD Minimum Standoff Distances for Buildings

UFC 4-020-01 Security Engineering Facilities Planning Manual

10 USC §2306

Procurement Generally, Kinds of Contracts

10 U.S.C. §2803

Military Construction and Military Family Housing, Emergency Construction (Cited in para 3-2c)

10 U.S.C. §2854

Military Construction and Military Family Housing, Restoration or replacement of damaged or destroyed facilities (Cited in para 3-2c)

10 U.S.C. Chapter 1803

Facilities for Reserve Components

10 U.S.C. §18233a

Facilities for Reserve Components: Limitation on certain projects; authority to carry out small projects with operations and maintenance funds (Cited in the Glossary, Section II, UMMC.)

10 U.S.C. §18234

Facilities for Reserve Components, Location and Use

10 U.S.C. §18237

Facilities for Reserve Components, Supervision of Construction: compliance with State law

16 U.S.C. §470 et. seq.

National Historic Preservation Act (Cited in paras 2-4e, 5-6l(4))

31 U.S.C. §§ 6301-6308

Using Procurement Contracts and Cooperative Agreements (Cited in para 4-3)

32 CFR Part 651

Environmental Analysis of Army Actions (Cited in paras 2-4e, and 5-6l(4))

42 U.S.C. §§4321-4370a

National Environmental Policy Act (Cited in paras 2-4e, 5-6l(4))

42 U.S.C., Chapter 103

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (Cited in paras 2-4e, 5-6l(4))

Section II

Related Publications

AR 1-33

The Army Memorial Program

AR 11-2

Managers' Internal Control Program

AR 55-80

DoD Transportation Engineering Program

AR 190-11

Physical Security of Arms, Ammunition and Explosives

AR 190-13

The Army Physical Security Program

AR 190-51

Security Of Unclassified Army Property (Sensitive And Nonsensitive)

18 U.S.C §1001

Fraud and False Statements.

29 CFR Part 1900 – Part 1926

Occupational Safety and Health Administration, Department of Labor (Safety and Health Regulations for Construction)

32 CFR Part 33

Uniform Administrative Requirements For Grants And Cooperative Agreements To State And Local Governments

36 CFR Part 800

Protection of Historic Properties

DA Pam 385-64

Ammunition and Explosive Safety Standards

DFAS Manual 37-100-XX

The Army Management Structure

DoD 4270.5

Military Construction

DoD 6055.9E

Explosives Safety Management and the DoD Explosives Safety Board

(EISA) 2007 Section 438
Energy Independence Security Act

Executive Order 11988
Flood Plain Management

Executive Order 12088
Federal Compliance with Pollution Control Standards

Executive Order 12148
Federal Emergency Management

Executive Order 12580
Superfund Implementation

Executive Order 13148
Greening the Government Through Leadership in Environmental Management

MIL-STD-3007
Standard Practice For Unified Facilities Criteria And Unified Facilities Guide Specifications.

NGR 130-6
United States Property and Fiscal Officer: Appointment, Duties and Responsibilities

TM 5-800-4
Programming Cost Estimates for Military Programs

10 U.S.C. Chapter 159
Real Property

Section III **Prescribed Forms**

DD Form 1354
Transfer and Acceptance of Military Real Property. (Cited in paras 1-4m(5), 5-6u(1), 5-12a, 5-12c, 5-13a, 5-13f)

DD Forms 1390/91
FY__ Military Construction Program. (Cited in paras 2-5a, 2-5c, 3-1, 3-1c, 3-3, 3-3a, 3-3c, 4-1, 4-1d, 4-2b(2), 4-3d, 4-5e, 5-1, 5-2, 5-3c, 5-3d(1), 5-3d(7), 5-3d(8), 5-5d(2)(a), 5-5d(9)a, 5-6f(2), 5-6h, 5-6j, 5-6p, 5-6x(8), 5-7c, 5-10, 5-11a, 5-11e(2)), 5-11h(1))

NGB Form 86-R
Funding Data for MCNG Contract. (Cited in paras 5-5c(6), 5-5d(4), 5-5d(9)(d), 5-7b(1), 5-11c)

NGB Form 87-R
Funding Data for Contract Modification. (Cited in paras 5-5d(6), 5-5d(8), 5-11i(2)(b), 5-11j(4), 5-11k(2))

NGB Form 593
Project Inspection Report. (Cited in paras 5-9c, 5-9d(3), 5-12c, 5-13b, 5-13c, 5-13d, 5-13e, 5-14b, 5-14c(1), 5-14c(2))

Glossary

Section I Abbreviations

AE

Architect-Engineering

AR

Army Regulation

ARNG

Army National Guard

ARNG-ILE

Army Environmental Programs Division

ARNG-ILI

Army Installations Division

ARNG-ILS

Army Logistics Division

ARNG-TR

Army Training Division

ARNG-AV

Army Aviation and Safety Division

NGB-AQ

National Guard Bureau Acquisition

ASIP

Army Stationing and Installation Plan

CERCLA

Comprehensive Environmental Response Compensation and Liability Act

CFMO

Construction and Facilities Management Officer

CFR

Code of Federal Regulations

CSI

Construction Specifications Institute

DA

Department of the Army

DD

Department of Defense

DDESB

Department of Defense Explosives Safety Board

DoD

Department of Defense

DoD

Department of Defense Directive

DoDI

Department of Defense Instruction

ECOP

Environmental Condition of Property

EBS

Environmental Baseline Survey

ESA

Environmental Site Assessment

EISA

Energy Independence Security Act

FAR

Federal Acquisition Regulation

FF&E

Furniture, Fixtures and Equipment

FRC

Facility Review Committee

FYDP

Future Years Defense Program

GSA

General Services Administration

IDIQ

Indefinite Delivery Indefinite Quantity

IRP

Infrastructure Requirements Plan

LRCP

Long Range Construction Plan

MCCA

Military Construction Cooperative Agreement

MCNG

Military Construction Army National Guard

NEPA

National Environmental Policy Act

NG

National Guard

NGB

National Guard Bureau

NGB-PARC

National Guard Bureau Principal Assistant Responsible for Contracting

NGB-JA

National Guard Bureau Judge Advocate

NGR

National Guard Regulation

O&M

Operation and Maintenance funds

OMB

Office of Management and Budget

OSD

Office of the Secretary of Defense

Pam

Pamphlet

P&D

Planning and Design

PPDC

Planning & Programming Document Charette

POM

Program Objective Memorandum

RFP

Request for Proposal

RFQ

Request for Qualification

RPAO

Real Property Accountable Officer

RPDP

Real Property Development Plan

RPLANS

Real Property Planning and Analysis System

SHPO

State Historic Preservation Office

SIOH

Supervision, Inspection, and Overhead

SOP

Standard Operating Procedures

TM

Technical Manual

UBC

Uniform Building Code

UMMC

Unspecified Minor Military Construction

USATCES

U.S. Army Technical Center for Explosives Safety

USATCESP

U.S. Army Technical Center for Explosives Safety Publication

U.S.C.

United States Code

USPFO

United States Property and Fiscal Officer

UXO

Unexploded Ordnance

Section II**Terms****AE Errors and Omissions**

Errors, deficiencies, and inadequacies resulting from the AE firm's failure to supply a professional quality, technically adequate, and fully coordinated set of design documents, whether in the designs, drawings, specifications, or other required services.

Addition/Alternation Project

A military construction project that either increases the overall size or capacity of an existing real property facility or adjusts interior arrangements or other physical characteristics of an existing facility.

Additive Bid Item

An item bid separately not required to complete a project within the validated scope as per the DD Forms 1390/1391. An independent element of the project that does not pre-condition the base project (i.e., it must be usable by itself) and clearly within the scope of the approved project. One of the two desired ways that the State bids items that are excess to authorization for Federal reimbursement or are not essential should the overall bid be in excess of Congressional authorization and appropriation. Also used when a State wants a separate price for an item.

Alternate Bid Item

An item bid separately as a substitute for an item required to complete a project within the validated scope as per the DD Forms 1390/1391. One of two desired ways that the State bids items that is excess to authorization for Federal reimbursement.

Canceled Funds

An appropriation, five years after the entire period of availability for its obligation has ended (i.e., five years after the appropriation has expired). In the case of almost all military construction appropriations this is at midnight on 30 September nine years after the fiscal year named on the appropriation. At this time the appropriation will be closed and any remaining balance (whether obligated or unobligated) in the account is canceled and thereafter not be available for obligation or expenditure for any purpose. Once an appropriation has canceled, obligations and adjustments to obligations that would have been properly chargeable to that appropriation, both as to purpose and amount, before closing may be charged to any current military construction appropriation. (See 31 U.S.C. § 1553(b).)

Construction

The erection, installation, or assembly of a new facility; the relocation of a facility; the complete replacement of an existing facility; or the addition, expansion, extension, alteration, or conversion (to a new type use) of an existing facility. This includes installed building equipment and related site preparation, excavation, filling and landscaping or other land improvements. It also includes increases in components of facilities for functional reasons when a facility is not being repaired and the components are not required to meet current standards, and it includes the extension of utilities to areas not previously served. Construction is an activity that may be a part of either the restoration or modernization program.

Construction Specifications Institute (CSI)

A non-profit organization dedicated to the advancement of construction technology through communication, education, research and service. CSI serves the interest of architects, engineers, contractors, product manufacturers and others in the construction industry.

Construction Specifications Institute Format

A master specification list of construction divisions and sections numbers and titles designated as Division 1 through Division 33 and accepted as a standard by the American Institute of Architects.

Contract Modification

A modification to an existing contract. This may occur when the contracting officer and the contractor mutually agree to the changes, in which case the modification may also be known as a supplemental agreement. Or this may occur when the contracting officer directs or orders the contractor to accomplish the work for a cost considered by the contracting officer to be fair and equitable compensation to the contractor, in which case the modification may also be known as a change order.

Contracting Agent

A person or department/agency authorized to enter into a contract for design and construction of a military construction project or

to perform design or construction of a military construction project by the direct employment of labor.

Contractor's Option

An alternate or additive bid item that if a contractor elects to provide it the firm does so at no cost over the base bid

Deductive Bid Item

An item bid separately proposed to be deleted from the baseline project within the validated scope as per the DD Forms 1390/1391. Not one of the two desired ways that the State should bid items that is excess to authorization for Federal reimbursement.

Demolition

The complete dismantling, tearing down, razing, wrecking, or burning of a fixed building or facility, to include the removal of foundations, utilities, and all debris, the backfill of all areas excavated by the work to maintain site grades and contours, and the reseeded of the property.

Design-Bid-Build

The traditional method of executing military construction projects, where design and construction are sequential and contracted for separately with two contracts and two contractors.

Design-Build

An alternative method of executing military construction projects that combines design and construction in a single contract with one contractor.

Design Control Cost

The total cost of a project as validated on the ARNG-ILI approved DD Forms 1390/1391.

Environmental Condition of Property (ECOP)

The general term for a variety of investigations conducted to classify the "environmental condition of [a subject] property." The investigations determine the existence, or the potential for existence, of environmental contamination (i.e., through release or disposal) from hazardous substances, petroleum products, and special contamination concerns on a parcel of real property. Once conducted, the results of ECOP investigations are used to determine if the condition of the property is suitable for the intended use or if response actions are warranted to ensure the property condition is consistent with the proponent's goals. In addition, ECOP investigations ensure that the ARNG does not acquire environmental liabilities of others, and protect the ARNG's legal interests. The ECOP "report" documents the results of these investigations.

Expired Funds

An appropriation, when balances no longer are available for incurring new obligations, because the time available for making such obligations has expired. In the case of almost all military construction appropriations this is at midnight on 30 September four years after the fiscal year named on the appropriation. After this time the appropriation retains its accounting classification and is only available for adjustment and liquidating obligations properly chargeable to the account (i.e., making obligations within the scope of the contracts in force at the time the appropriation expired). If there are insufficient expired funds available, then military construction appropriation funds available at the time that the contract was issued will be used, or, if these are not available, then current year funds are used. At midnight on 30 September of the fifth year after the period of availability of the appropriation ends, the account is closed and the funds are not available for any purpose. (See 31 U.S.C. § 1553(a))

Facility

A separate and individual building, structure, utility system, or other real property improvement identifiable with a category code from DA Pam 415-28. Supporting elements for structures, such as sidewalks, fire hydrants, gasoline and diesel fuel dispensing systems, flammable materials buildings, roads, fencing, and hard stand, are all separate facilities.

Incremental Construction

The splitting of a project into separate parts where

- (a) It is done solely to reduce costs below an approval threshold or the unspecified minor construction ceiling, or
- (b) Each part is not in itself complete and usable, or
- (c) The total project is not complete until all parts are complete

Installed Building Equipment (IBE)

Installed building equipment (real property) are items that are affixed or built into the facility and become an integral part of the facility. Such property may be supported with military construction funds.

Location Map

Prepared related to the north point at a larger scale than the vicinity sketch, it provides information on existing conditions adjacent to the property on which an MCNG project is located. The map identifies all existing major structures in the neighborhood, including names of roads, streets, streams, etc.

Operation and Maintenance funds (O&M)

O&M appropriations traditionally finance those things whose benefits are derived for a limited period of time. Examples of costs financed by O&M funds are minor construction projects of \$750K or less, expenses of operational military forces, training and education, recruiting, depot maintenance, base operations support, and assets with a system unit cost less than the current procurement threshold (\$250K). O&M appropriations are normally available for obligation for one fiscal year. O&M appropriations are budgeted using the annual funding policy.

Major Construction

A military construction project separately authorized and appropriated by Congress, normally in an amount in excess of the unspecified minor construction statutory limit.

Major Land Acquisition

The purchase, withdrawal from public domain, lease, permit from individuals or government entities, or any other type of use agreement involving more than 1,000 acres or an estimated purchase or annual lease cost of more than \$1 million.

Personal Property (Fixed)

Capital equipment and other equipment of a movable nature that has been fixed in place or attached to real property, but which may be severed or removed from buildings without destroying the usefulness of the facilities. Such property may not be supported with military construction funds. Use Operation and Maintenance funds.

Personal Property (Moveable)

Equipment that is movable and not affixed as an integral part of the facility. Such property may not be supported with military construction funds.

Planning and Design

Funding to prepare engineering plans, drawings, and specifications required to execute a military construction project.

Real Property Exchange

A program whereby existing ARNG operated property is exchanged for private sector property so that the ARNG receives property worth the total replacement cost of the existing property or fair market value, whichever is greater. The purpose of the program is to acquire more advantageous property thus reducing military construction requirements.

PRIDE Web

A customized version of a commercial off the shelf computer integrated facilities management system. It serves as the ARNG's information management system used by ARNG Directorate and the CFMOs to manage real property assets from cradle to grave and to track and maintain all facilities related data, including project data.

Site Preparation

Clearing; grubbing; demolishing existing structures; removing existing utilities, excavation, embankment earth work, drainage channels or systems, and retaining walls; grading/compaction of site soils to proposed subgrade elevations; and taking necessary environmental compliance actions.

Sustainable Design and Development

The systematic consideration of current and future impacts of an activity, product, or decision on the environment, energy use, natural resources, the economy, and quality of life. In terms of military construction, it is also the design, construction, operation, and reuse/removal of the built environment (infrastructure and buildings) in an environmentally and energy efficient manner.

Unspecified Minor Military Construction (UMMC)

MCNG projects, funding is limited to the statutory limits of 10 U.S.C. §18233a, that are unforeseen urgent requirements that cannot wait for the normal MCNG programming process. Examples include facility shortfalls resulting from changes in mission and equipment and damage caused by severe weather or other acts of nature.

Vicinity Sketch

A sketch related to the north point and to scale showing the location of an MCNG project in relation to adjacent towns, cities, environmentally sensitive areas, main thoroughfares, highways, and the public street network. If the site is subject to zoning regulations, then the map will specify the classifications for the site and adjacent areas.

ATTACHMENT F

NGB PAM 415-12 ARMY NATIONAL GUARD FACILITIES ALLOWANCES



TETRA TECH

National Guard Pamphlet 415-12

Construction

Army National Guard Facilities Allowances

**National Guard Bureau
Arlington, VA 22204
25 January 2015**

UNCLASSIFIED

SUMMARY of CHANGE

NG Pam 415-12
ARMY NATIONAL GUARD FACILITIES ALLOWANCES


o This revision, dated 25 January 2015 has been extensively revised and must be reviewed entirely.

Construction

ARMY NATIONAL GUARD FACILITIES ALLOWANCES

By Order of the Secretary of the Army:

JUDD H. LYONS
Major General, GS
Acting Director, Army National Guard

Official: 
Charles P. Baldwin
Deputy Chief of Staff

History. All Common Supporting Items have been included in Chapter 1. This revision also includes technical corrections to the 1 June 2011 version which is hereby superseded.

Summary. This pamphlet establishes allowances and provides guidance to the States for building space and supporting items used for programming the construction of Army National Guard facilities.

Applicability. These standards apply to all federally funded Army National Guard construction.

Proponent and exception authority. The proponent of this pamphlet is the Chief of Installations, National Guard Bureau, Army Installations Division (ARNG-ILI). Exceptions to criteria will be reviewed by the ARNG staff proponents for recommendations of concurrence or non-concurrence. The Chief of Installations has the sole authority to approve exceptions to the criteria presented in this document that are consistent with applicable laws and regulations. This authority may not be delegated.

Management Control Process. The proponent of this pamphlet is the ARNG-ILI. Exceptions to criteria will be reviewed by the ARNG staff proponents for recommendations of concurrence or non-concurrence. The Chief of Installations has the sole authority to approve exceptions to the criteria presented in this document that are consistent with applicable laws and regulations. This authority may not be delegated.

Supplementation. Supplementation of this regulation requires the approval of the Army National Guard, Installations Division, ARNG-ILI, 111 South George Mason Drive, Arlington, VA 22204.

Suggested Improvements. Users of this pamphlet are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to the National Guard Bureau, Army Installations Division, ARNG-ILI, 111 South George Mason Drive, Arlington, VA 22204.

Distribution. B.

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Chapter 1

General

1-1. Purpose

This pamphlet identifies the allowable space criteria for facilities supported by Federal contributions to the State, either totally or in part. It gives information on general construction standards, materials, space allowances, building circulation, and other requirements directly related to programming military construction projects. As such, it is the major reference document required for preparing DD Forms 1390/1391.

1-2. References

Required and related publications are listed in Appendix A.

1-3. Explanation of Abbreviations and Terms

Abbreviations and special terms used in this pamphlet are explained in the glossary.

1-4. Applicability

The formats, processes and tables of this pamphlet are designed to cover most circumstances commonly met during preparation of military construction programming documents. However, unusual project circumstances may dictate that the State justify and request an exception to criteria (ETC). Exceptions to criteria are recommended by ARNG proponent and approved by ARNG-ILI.

1-5. Common Standards

States shall incorporate into programming documents the construction standards identified in special DoD publications, such as Unified Facility Criteria (UFC) for antiterrorism/force protection, and all environmental protection and safety measures required by Federal, State, and local codes and regulations.

1-6. General Construction of Buildings

- a. Buildings shall be constructed of materials rated as non-combustible. The exterior walls may be brick with concrete masonry unit backup or other suitable systems. In certain instances pre-fabricated metal buildings may be used where allowed by codes and it is economically feasible. In those cases, exterior walls may be veneered with brick when co-located with a readiness center or when justified by environmental and aesthetic considerations of the surrounding facilities and communities.
- b. Roof systems, either of low slope or hip/gable type construction, normally consist of lightweight joists, non-combustible decking, and insulation above the decking. If the roof is a low slope type, the final layer shall be built-up bituminous material, a single ply membrane, or standing seam metal. However, if the roof is hip or gable type construction, it shall be a standing seam metal roof, or covered with asphalt, or fiberglass shingles.
- c. Walls and partitions may be drywall, CMU block, or other economically suitable material that will provide a durable structure.
- d. Floors are normally constructed with concrete.
- e. Design shall incorporate the use of space saving, energy-saving, alternative energy options (i.e., Geothermal, Radiant Heat, Solar Electric), as well as other sustainable design features wherever justified by Life-Cycle Cost Analysis (LCCA). ARNG MILCON projects are required to achieve, at a minimum, a certification of silver based on the latest edition of US Green Building Council's Leadership in Energy and Environmental Design (LEED) standards and the Sustainable Design and Development Policy Update 13 December 2014.
- f. Mechanical ventilation shall be provided for administrative, surface equipment maintenance, aviation maintenance, billeting, latrine, dining, and training facilities in accordance with UFC 1-200-02.
- g. Air conditioning requirements for comfort cooling will be evaluated and approved by the Adjutant General based on local conditions. The Adjutant General's justification (based on Unified Facilities Criteria (UFC) 3-400-02, Design: Engineering Weather Data) shall be enclosed with the DD Forms 1390/1391. As a general rule, and for planning and programming purposes, the tonnage of air conditioning required to cool an authorized space may be estimated by dividing the total floor area (in square feet) of the space by 300.
- h. Sustainability/Energy Measures. Sustainable design and construction features mandated since September 2011 are authorized for the primary facility. For programming purposes, enter a separate line on the DD Form 1391 and compute the requirement at 2% of the cost of the primary facility.
- i. Emergency power generator pad and house connection/hook-up:

(1) National Guard Readiness centers, aviation maintenance facilities, and USPFPO administrative offices (as per AR 420-1 (4-67)) are authorized stand-by power generator sets and pertinent functional components, such as an automatic transfer switch, fuel storage tank, and associated conduit and wiring to electrical power circuits, to ensure continuous operation. These are to support environmental, health, and safety equipment requirements essential to Army National Guard (ARNG) missions during a prolonged (four hours duration) power outage. Power generator sets and pertinent functional components may be acquired with funds from the military construction appropriation. The generator may be installed inside the mechanical room or outside with factory design housing. Generator sets are authorized to power up to 35% of the facility's electricity load requirements. Generator sets to power higher than 35% of the facility's electricity load requirements must be approved as an ETC. Generator sets should be added as a line item in primary facilities of Block 9 of the DD Form 1391. The priority for emergency power generator supply shall be as follows in descending order:

- (a). Fire protection and detection
- (b). Access control
- (c). Communications and Automation Operations (G6), IT DEMARK Rooms, and Range Control Operations Building
- (d). Lighting (up to 20% of the facility lighting)
- (e). Elevators (Maximum of one elevator at each entrance)
- (f). Administrative Offices (office equipment), including Post Headquarters Facilities at the Training Centers
- (g). Heating, ventilation and air conditioning (HVAC)

(2) For all other facilities, only a 150SY emergency power ridged generator pad and house connections/hook-up are authorized. This requirement is limited to a 6-inch thick concrete mounting pad with a house connection/hook-up outlet necessary to provide temporary mission but essential electricity during emergency operation of the facility. The emergency generator itself is considered portable equipment and must be obtained with funds other than from the military construction appropriation.

1-7. Flexibility

The space allowance for any functional area (except the readiness center assembly hall, maintenance training work bays, indoor rifle range (if approved by ETC), training device/simulations center, general purpose and special purpose maintenance work bays, unheated storage, and hangar floor) may be increased by up to 15 percent, provided that the total allowable functional net area is not increased as a result. In order to provide the necessary off-setting reduction for these space increases, any functional space (except a work bay, indoor rifle range, training device/simulations center, unheated unit storage area, or hangar floor) may be reduced by a maximum of 15 percent. Functional areas may be completely removed from a facility if they are not needed. However, in that case, the total allowable net space must be reduced by a like amount.

1-8. Restrictions to Support by Federal Funding

- a. Real estate. Sites for the construction of ARNG facilities shall generally be owned or leased by the State and procured without federal reimbursement. This does not, however, preclude the construction of new ARNG facilities or the rehabilitation of existing buildings on federally owned land licensed to the State for ARNG facility use.
- b. Prewired work stations. Prewired workstations are not authorized to be funded through the military construction appropriation. They are not to be classified as installed building equipment and are to be included in the programming documents as equipment associated with the project that will be provided from other appropriations.
- c. Future improvements. Designing in capacities for future improvements to a specific project is prohibited unless fully justified as an exception to criteria and clearly described in the narrative portion of the programming documents (DD Form 1391). Providing additional capacity for utilities adjacent to contiguous unheated storage with the intent to provide heating and/or cooling of that unheated space in the future is strictly prohibited without exception.

1-9. Common Supporting Items, Features, and Allowances for All ARNG Facilities

In planning the functional arrangement of facilities, the State shall give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The support items include:

- a. Site preparation. The work of clearing, grubbing, stripping, and stockpiling topsoil, excavating embankment, and rough grading required to develop the project site to sub grade levels and elevations for proper siting and drainage of facilities (including culverts, head walls, retaining walls, retention ponds etc.). The State must use its own funds for the special handling/remediation/disposal of contaminated soil excavated from a non-federally owned or leased project site.

(1) Rock excavation and correction of unsatisfactory soil conditions is authorized only if the state has submitted adequate supporting documentation such as an economic or master planning analysis that demonstrates that the positive impacts on readiness strongly outweigh the increased construction costs at that site.

(2) Culverts, retaining walls (installed in lieu of sloping the ground to achieve grade differentials), drainage systems, or other similar construction required for controlling surface water runoff will be approved on an individual site basis if the State justifies these items. The State, however, must consider the cost of these items during the site selection process and submit an exception to criteria for approval.

(3) A storm water pollution prevention plan must be implemented during construction to prevent soil erosion. The plan must be written and implemented in accordance with federal, state, and local regulations.

b. Fine grading and seeding.

(1) The state may program for fine grading and seeding to provide proper site drainage and control of erosion on those parts of the project site where the previously existing surface cover has been destroyed or buried beneath redistributed soil.

(2) Sodding or sprigging is authorized for critical areas subject to erosion.

(3) Importing topsoil is authorized if the natural topsoil on the site, stockpiled at the beginning of construction, is inadequate to provide a finished depth of approximately four inches.

c. Landscaping. This shall be included as an integral part of the planning of the project to produce an aesthetically pleasing final site that consists of natural (native) species or non-native varieties which are non invasive to the surrounding landscape.

(1) The state may program up to three percent of the basic building cost for planting trees, shrubs, and vines (exclusive of grading and seeding or sprigging and sodding for erosion control). In those locations that are considered to have an arid climate, the state may program up to four percent of the basic building cost and may use xeriscaping.

(2) Additional planting for energy conserving landscaping may be authorized if the state justifies it on a life cycle cost basis.

(3) An installed watering system (sprinkler) is authorized. The sprinkler must be designed in accordance with Federal Water Efficiency Requirements. Refer to ARNG DG 415-5 Chapter 3, 3-2.2 - Water Efficiency, and Chapter 6, Section 2 - Exterior Improvements for guidance on Irrigation Systems.

d. Parking: All parking areas must be designed in accordance with the requirements of UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings and UFC 4-010-02, DoD Minimum Antiterrorism Standoff Distances for Buildings.

(1) Military Vehicle Parking (MVP) (Organizational Vehicle Parking, Paved CATCODE 85210). Rigid concrete or gravel is authorized for paving those areas designated for the parking of military vehicles. For programming purposes the concrete shall be eight inches in depth. Actual depth should be determined during design based on soil conditions and loading requirements.

(i) Parking is authorized for all vehicles, trailers, equipment, etc (including GSA and other Non-Tactical Vehicles (NTV)), that are permanently stationed at each facility type. This includes equipment hand receipted from units exclusively for facility operating requirements.

(ii) Parking is also authorized at a Combined Support Maintenance Shop (CSMS), Maneuver Area Training Equipment Site (MATES), Unit Training and Equipment Site (UTES), and Field Maintenance Shop (FMS) for 10 percent of the vehicles, trailers, equipment, etc., authorized to receive maintenance at that facility but not permanently stationed at the facility and for prepositioned equipment at Training Centers.

(iii) See Military Vehicle Parking allowances shown in Table 1-1. This area includes an allowance for circulation lanes within the parking area in addition to any required access roads.

Table 1-1. Military Vehicle Parking

Type of Equipment	Per Vehicle Allowance
Wheeled Vehicles/Trailers/Other Wheeled/Towed Equipment <30' in length	50 SY
Equipment > 30' in length, including PLS Trailer	75 SY
Tracked Vehicles, Engineer Vehicles	75 SY
Fuel Trucks	175 SY
HETs	275 SY

(iv) For other unique equipment that must be stored within the military vehicle parking area, such as skid-mounted generators, snowmobiles, and transportable containers organic to the assigned units, the State may program an appropriate amount of space as an exception to criteria. Documentation to support this request must be provided along with the project programming documents.

(v) Unheated Enclosed or Shed-Type Vehicle Storage Space

a. Federal support for enclosed or shed-type storage is authorized IAW NGR 415-10. This vehicle storage space may be constructed as a 'pole barn-type' structure with a shed roof and open sides or it may be constructed with enclosed sides and fitted with vehicle access doors. When storing more than five vehicles, the space must be designed to conform with all applicable codes, standards and dry pipe sprinkler system (reference NFPA standards) protected.

b. When enclosed or shed-type storage is provided, the amount of open air paved area authorized for parking of military vehicles at the site shall be reduced by the area of the covered/enclosed space.. (Refer to paragraph 3-4.) Vehicle storage space shall be unheated and shall not exceed 66% of the normally authorized open-air military parking area. The remaining paved area is to be used for circulation and access to and from the covered or enclosed storage structure; as well as for the parking remaining vehicles. For example, if a SEMF is authorized 100,000 SY for open air military vehicle parking and the NGR 415-10 requirements are met for enclosed or shed-type vehicle storage, then up to 66,667 SY could be used for enclosed parking. The remaining 33,333 SY would then be authorized for the circulation and access to and from the parking structure and parking remaining vehicles.

c Vehicle spacing must be tightly controlled. Vehicles should be parked nose to tail with only the minimum space required for personnel to maneuver between the vehicles to access operator or driver access doors on the vehicles. There would not be any 'drive-through' vehicle lanes.

d Overhead or rollup doors at approximately 25 feet on centers are authorized on two sides of enclosed structures at the rate of one for each 1800 square feet of floor area to provide for mass parking of vehicles without the need for internal circulation lanes.

e. A 60 foot deep concrete apron is authorized for each side of the facility with vehicle entrances.

(2) POV Parking (Non-organizational Vehicle Parking, Paved CATCODE 85215)

(i) This area includes an allowance for circulation lanes within the parking areas (Note: this does not include the access road). For programming purposes, flexible pavement (or concrete if supported by an Economic Analysis) shall consist of six inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete or flexible pavement curbs may be installed along pavement edges to comply with the site's approved storm water management plan or to preclude soil erosion.

(ii) See POV Parking allowances shown in Table 1-2:

Table 1-2. POV Parking*

Facility Type	Allowance
Readiness Center	35 SY times 90% of the authorized strength of the assigned units required to train simultaneously. The 90% ratio of authorized strength depends on the adequacy of public transportation serving the site (TBD by Design).
Logistics Facility	35 SY per required full-time staff of the facility, including contract personnel.
Aviation Facility	35 SY times the required full-time staff of the facility, including contract personnel, or, if larger, 35 square yards times 90% of the authorized strength of the non co-located units required to train simultaneously.
Training Facility	35 SY times the sum of the full-time staff (including permanently assigned Federally reimbursed State employees) and 50 % of the billeting capacity of the training center.
Educational Facility	35 SY times the sum of the ARNG-TR validated maximum student load and the full-time staff (including instructors).

Notes:

1/ 35 SY is factored on a 10 FT by 20 FT parking space with a 10 FT by 12 FT circulation aisle included.

(3) Visitor/Customer Parking (Nonorganizational Vehicle Parking, Paved CATCD 85215)

(i) Visitor/customer parking spaces are authorized as indicated in Table 1-3- Visitor/Customer Parking based on the number of required full time employees including permanently assigned federally reimbursed State employees. The allowance includes circulation lanes, required access roads are an additional allowance.

(ii) In addition to the number of spaces shown below, for every 50 (or fraction thereof) authorized spaces, an additional 60 square yards is authorized for a handicapped parking space.

(iii) For programming purposes, flexible pavement or concrete (if supported by an Economic Analysis) shall consist of six inches of bituminous material placed over an installed, appropriate aggregate base. Rigid concrete, granite or flexible pavement curbs may be installed around pavement edges if required to control storm water per the site's approved storm water management plan.

Table 1-3. Visitor/Customer Parking

Facility Type	Allowance	# of Employees	# of Parking Spaces
Readiness Center	35 SY	N/A	To be designed by the A-E for specific location and approved by ARNG-ILI
Logistics Facility	35 SY	5-15	4
		16-25	7
		26 & over	9 (plus one additional parking space for every 10 employees or major fraction thereof > 26)
Aviation Facility	35 SY	N/A	12
Training Center Facility	35 SY	5-15	4
		16-25	7
		26 & over	9 (plus one additional parking space for every 10 employees or major fraction thereof > 26)
Educational Facility	35 SY	5-15	4
		16-25	7
		26 & over	9 (plus one additional parking space for every 10 employees or major fraction thereof > 26)

(4) Fuel Truck Containment Area. In addition to the parking allowances above, a minimum of 75 square yards of rigid concrete is authorized to construct a containment area for each fuel truck or trailer that stores POL on board. In accordance with applicable environmental, safety and fire protection regulations, each containment area is to be designed and sized so that it is capable of capturing and retaining 110% of the POL volume stored in

or on the fuel storage truck/trailer/tank positioned within that area along with sufficient freeboard to contain precipitation. A roof type cover will be provided, and designed in accordance with UFC 3-110-03 if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area. The local climatic condition can be determined by contacting the National Climatic Data Center, or from historical data presented in US Army TM 5-785 Facility Design and Planning, Engineering Weather Data.

e. Loading Dock. For facilities that receive/ship products in large bulk (e.g. USPFO warehouse, CIF, etc.), a four foot high, covered loading dock fitted with a dock leveler for each truck docking space shall be provided in the receiving and shipping areas. A basic length of 22 feet to accommodate one truck plus 10 feet for each additional truck space is authorized. Thus, a loading dock to accommodate three trucks would be 42 feet in length. Docks should be 15 feet in width from face of building to edge of loading dock. The dock shall also have an access ramp 10 feet wide (not to exceed a 12 degree incline) to provide forklift access.

(1) Logistics facilities, including Basic Issue Item (BII) warehouses located at MATES/UTES, are authorized loading docks that accommodate a maximum of three trucks simultaneously.

(2) Aviation facilities are authorized loading docks that accommodate a minimum of two trucks simultaneously.

(3) Any other loading dock requirements will be addressed as exceptions to criteria.

(4) Final design plans will dictate the actual loading dock length.

f. Military Vehicle Loading Ramps. Military vehicle loading ramps may be constructed to assist in loading and off-loading military vehicles (wheel and track) from equipment transporters that do not have loading ramps as an integral part of the vehicle trailer. A multi-level loading ramp not to exceed a footprint of 160 SY is authorized. The maximum ramp incline will not exceed 12 degrees. Sufficient area should be allocated to accommodate the vehicle turning radius for loading/off loading equipment.

g. Turn Pads. For facilities supporting tracked vehicles, rigid concrete turn pads are authorized where frequent turning of tracked vehicles is required on flexible pavement. The facility design shall limit the number of pads to the minimum required to preclude damaging flexible pavement. Pads should each be 30 feet by 30 feet (100 square yards). Three hundred square yards of concrete (three turn pads) shall be used for programming purposes. However, the exact number of turn pads will be determined during the design review based on an economical and practical facility site layout.

h. Service and Access Aprons. Rigid concrete paving may be provided for access to each dumpster, controlled waste handling facility, and any other facility requiring outside access by forklifts or large, heavy vehicles. Allowances for service and access aprons are indicated by an "X", "N/A" means aprons are not authorized for that function – See Service and Access Apron allowances shown in Table 1-4:

Table 1-4. Service and Access Aprons

Apron/Access	Allowance	Readiness Center	Logistics Facility	Aviation Facility	Training Facility	Educational Facility
Firefinder Radar	150 SY	X	X	N/A	N/A	N/A
Refuse Coll Fac	150 SY	X	X	X	X	X
Controlled Waste	150 SY	X	X	X	X	X
Loading Dock	150 SY	X	X	X	X	N/A
Military Veh Loading Ramp	250 SY	X	X	X	X	X
Fuel Storage & Dispensing System	250 SY	X	X	X	X	X
Wash Platform	250 SY	X	X	X	X	N/A
Assembly hall	500 SY	X				
Maintenance & Training Bay Doors	60' deep <u>1</u> /	X	X	X	N/A	N/A
USPFO Warehouse Service Apron	60' deep x loading dock length	N/A	X	N/A	N/A	N/A
Aviation Hangars	100' Deep(120' for CH47) x hanger door width	N/A	N/A	X	N/A	N/A

Notes:

1/ A 60 foot deep, as measured from the maintenance bay doors, concrete apron may be installed to provide a paved access to general, special purpose, and maintenance training work bays. Where work bays are adjacent to each other, the aprons should be contiguous.

i. Access road and entrance throat. The primary entrances and access roads are authorized a width of 32 feet. More than one entrance may be authorized based on a demonstrated requirement to separate military and civilian vehicle traffic and to satisfy access requirements for fire and emergency vehicles. For programming purposes, the access road shall consist of 5000 square yards of flexible or rigid pavement, unless a greater amount is justified by a detailed site plan. However, the exact amount and type of pavement will be determined at the concept/preliminary design review based on an economical and practical site facility layout and code considerations.

j. Curbs. Rigid concrete, cut stone, or flexible pavement may be used for curbing along the edges of the roads and parking areas to comply with code, to control traffic, or to control storm water per the site’s approved storm water management plan.

k. Security Fencing. Security fencing shall be constructed IAW guidance in Army Techniques Publication (ATP) 3-39.32. For planning purposes, a fence consisting of a six foot high chain-link-type metal fabric, with a barbed wire top guard facing upward and outward at a 45 degree angle extending the fence height by at least one foot, shall enclose the military vehicle parking, service and access areas, and ancillary facilities. Fencing shall include vehicle and personnel gates, which may be electronically controlled. The fencing shall be located IAW Army security regulations and Anti-Terrorism/Force Protection (AT/FP) requirements. The area between the edge of pavement and the fence may be seeded with grass, or a well-designed non vegetative cover (not to exceed four inches of rigid pavement) may be substituted. For aviation facilities, the following applies:

(1) Additional fencing may be authorized at stand-alone facilities when approved as an exception by ARNG Aviation and Safety Division (ARNG-AV).

(2) The fence shall be located so as to enclose the aircraft parking area and shall be equipped with gates of sufficient width to permit ingress/egress from the area to existing runways, taxiways, etc., at the airport. Air safety must be considered in the design of both fencing and security lighting.

(3) Where feasible the fence shall connect to the existing airport boundary security fence, if the boundary fence meets NGB requirements.

l. Site AT/FP Measures. A separate fence, wall, passive vehicle barrier, landform, or line of vegetation shall be applied along the exterior perimeter of the site to create a protective standoff and obscure vision, hinder personnel access, and hinder or prevent unauthorized vehicle access. In addition, a guard house/access control facility not to exceed 550 square feet is authorized when determined to be appropriate following completion of an AR 190-51 security risk assessment. Such a facility may be equipped with an environmental control system, electric service, latrine, and voice, video, and data communication links. The requirements of Unified Facilities Criteria (UFC) 4-010-01 must be met.

m. Sidewalks. For programming purposes, sidewalks shall be 15% of the building footprint. However, the exact amount of sidewalk area will be determined at the concept design review based on an economical and practical site layout of the facilities.

n. Flagpoles: ARNG facilities are authorized flagpoles per Table 1-5.

Table 1-5. Flagpoles 1/

Facility Type	Allowance
Readiness Center	Two ground-set flagpoles (three for general officer commands) with illumination.
Logistics Facilities	Two ground-set flagpoles with illumination, unless the facility is collocated with a readiness center or another ARNG facility with flagpoles or is on a military installation that already has or will have flagpoles
Aviation Facilities	
Training Center Facilities	
Educational Facilities	The educational complex is authorized two ground-set flagpoles with illumination, but only if the installation on which it is located does not already have one.

Notes:

1/There shall only be 1 American flag per site, if one exists already on site, then the authorized number will be reduced by 1

o. Exterior Fire Protection. Consideration shall be given to the size of the structure, the type of construction, and the exposure to fire hazard that it creates for or receives from nearby buildings. Except in cases of conflict with state requirements, exterior fire protection should be in conformance with National Fire Protection Association requirements. Extension of water mains for fire protection is limited to that needed to ensure that an adequate number of fire hydrants can be located between 50 and 400 feet of any building. No more than 300 linear feet of pipe per water line required by code may be outside the property line.

p. Detached Facilities Sign/Static Display. In addition to the authorized building-mounted facilities sign, a free-standing sign is authorized identifying the facility name and type, street name, the State, and Army National Guard/Joint Facility Identity. Lighting to illuminate the sign continuously during hours of darkness may be provided. Provisions may also be made at this facility for a static display, including a concrete slab or mounting pedestal.

q. Outside Security Lighting. Security lighting of military vehicle/equipment storage and other outside area lighting should be in keeping with minimum needs for personnel safety and security or as required by physical security regulations. Lighting of fuel islands is authorized. A security lighting system is authorized that permits ample lighting to conduct safe after hour training and is designed to illuminate continuously during the hours of darkness or equipped with sensors which when activated by movement within the designated area will cause the lights to illuminate. After discontinuance of movement within the designated area, the lights should remain lit for a time determined to be appropriate for the specific situation by the security manager. Vandal resistant lenses should be provided where appropriate. Wherever possible, security lighting shall be provided from building-mounted fixtures. Pole-mounted fixtures may be used to supplement the building-mounted fixtures and where building-mounted fixtures are inadequate.

r. Interior Space Lighting. Along with day lighting techniques, the use of innovative, energy conserving interior lighting concepts, such as low-voltage; high lumen output fixtures, LED lamps and high bay; fluorescent illumination is encouraged whenever a cost-benefit analysis indicates that it is prudent based upon a comparison of the savings derived when the estimated installation cost plus the cost of maintenance over the expected life-span of the product are compared with like costs for a more conventional lighting technique.

s. Fuel Storage and Dispensing Systems are authorized provided that:

(1) The State's surface vehicle fuel management plan justifies the use of a fuel storage and dispensing system at this location because of a lack of nearby military facilities, an agreement with other state facilities, or local private sources (using credit/debit cards).

(2) The facility is not located within a mile of a surface maintenance facility with fuel storage and dispensing capability,

(3) There are at least 15 vehicles using each type of fuel assigned to the facility,

(4) The storage facilities shall be built to nationally recognized environmental standards and IAW local ordinances,

(5) A roof type cover will be provided, and designed in accordance with UFC 3-110-03 if required by local code or local climatic conditions (e.g., excessive heat or snow), to prevent overheating of fuel and/or to preclude the introduction of storm water runoff into the sump of the containment area. Local climatic condition can be determined by contacting the National Climatic Data Center, or from historical data presented in US Army TM 5-785 - Facility Design and Planning, Engineering Weather Data.

(6) For Readiness Centers, Logistics Facilities, and Educational Facilities, the system capacity shall not exceed the quantities in Table 1-6 below:

Table 1-6. Fuel Storage and Dispensing Systems

No. of Vehicles Using Type of Fuel	Capacity Per Type of Fuel
0 – 14	N/A
15 – 39	3,000 Gallons
40 – 69	5,000 Gallons
70 – 100	7,000 Gallons
101 – 250	10,000 Gallons
Over 250	20,000 Gallons

(7) Aviation Facilities: Aircraft fuel storage and dispensing system is authorized in accordance with UFC 3-460-01 16 August 2010, with direct fuel truck access to the aircraft parking apron.

(8) Training Sites: Fuel storage and dispensing systems are authorized at an amount not to exceed a 15 day supply based on the largest 15 day requirement during the training year.

t. Wash Platforms for all facilities are authorized as follows:

(1) Unless otherwise noted below, one concrete wash platform, not to exceed 115 SY, is authorized when 10 or more motor vehicles are authorized to be physically located at the facility and if the facility will not be located within a mile of a surface equipment maintenance facility with vehicle washing capability.

(2) A roof type cover will be provided if required by local code to prevent storm water from draining into the sanitary or storm water sewer system. This structure shall be listed as a separate primary facility line item in block 9 of the DD Form 1391.

(3) An exterior wash platform may be enclosed by a heated shed-type structure and a heated aviation wash-rack may be constructed when the heating design temperature, as designated in UFC 3-400-02, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches. This structure shall be listed as a separate primary facility line item in Block 9 of the DD Form 1391.

(4) SEMF:

(i) One wash platform, not to exceed 115 SY, is authorized at each SEMF.

(ii) Additional wash platforms are authorized for each 100 vehicles, or major fraction thereof, in excess of the initial 100 vehicles authorized to receive maintenance at the facility.

(iii) An interior wash bay as authorized in Table 3-4 shall count as one wash platform.

(iv) When it can be justified, a centralized wash facility (birdbath type) may be authorized as an exception to criteria at a UTES or MATES. The use of a closed-loop water circulation system with replenishment to make-up any water lost through evaporation is preferred as environmentally prudent.

(5) Aviation Facility:

(i) In addition to the vehicle wash platform authorized above, one aircraft wash area (washing apron), category code 11370, is authorized at each aviation facility to be constructed of rigid concrete according to UFC 3-260-1.

(ii) Maximum allowance is 118 feet by 74 feet (140 feet by 110 feet for CH-47s).

(6) Training Facilities:

(i) The number of wash platforms authorized at a training center is in addition to those authorized for a MATES located on the training center but does not include any wash platforms at other DoD component facilities on the training center that are available for ARNG use.

(ii) Size and design of wash facilities shall be IAW TM 5-814-9.

(iii) Other environmental measures required by federal, state and local codes shall be included.

Central birdbath wash facilities must be justified on a case-by-case basis.

(iv) An exterior wash rack may be enclosed by a heated shed-type structure when the heating design temperature, as designated in UFC 3-400-02, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

u. Utilities: All building utility service connections shall be underground. The length of service for each utility is limited to the distance of the shortest run from the building to the property line adjacent to the public right-of-way providing ingress and egress for the site plus up to an additional 300 linear feet for connection to the existing utility system. The state is responsible for any additional utilities beyond the 300 FT. Direct-burial of

cable for telephone, data, and electric service connections is authorized. This includes conduit where the service connection(s) must pass under a paved area.

(1) Construction of an on-site water well, a cistern with a chlorination system, a sanitary waste water treatment system, or tanks for the storage of heating fuels, such as liquid petroleum gas or number two oil, as well as delivery piping is authorized if like public services are not available. Such systems must conform to the requirements of the local approval authority and all applicable federal, state, and local environmental laws and regulations.

(2) The installation of any renewable energy system, either active or passive, to provide supplemental space heating or electric service is authorized when it can be demonstrated that the projected conventional energy cost savings will equal or exceed the installation costs during the projected service life of the alternative energy system. All projects that use alternative energy sources are required to conduct a cost benefits economic analysis in BLCC regardless of cost. Line will show as follows:

- (i) Heating Plant, Geothermal: FCC 82187, U/M: EA, Quantity: Number of well farms.
- (ii) Heating Plant, Solar: FCC 82182, U/M: EA, Quantity: Number of Solar Arrays
- (iii) Wind Turbine: FCC 81146, U/M: EA, Quantity: Number of Wind Farms.
- (iv) Electric Power, Photovoltaic: FCC 81122, , U/M: EA, Quantity: Number of Solar Arrays

When an alternative energy source is used, each type will be a separate primary facility line item. As of FY16, every project is required to have an analysis conducted on weather renewable energy sources are cost beneficial or not. Life cycle cost effectiveness as defined in 10 CFR 433.2, applies to this entire document unless otherwise stated. All Life Cycle Cost Analyses (LCCA) performed must be prepared in accordance with 10 CFR Part 436, Subpart A and NIST Handbook 135 “*Life-Cycle Costing Manual for the Federal Energy Management Program*”. LCCA must be prepared using the Building Life Cycle Costing (BLCC) program, available from the National Institute of Standards and Technology (<http://www.nist.gov/el/buildeconomic.cfm>). A link to BLCC may also be found at the Department of Energy’s building energy tools web site, http://www1.eere.energy.gov/femp/information/download_blcc.html. When needed, use weather data obtained from UFC 3-400-02.

(3) Energy Policy Act 2005 (EPAAct 2005): Section 103 of EPAAct 2005 requires that “all Federal buildings shall, for the purposes of efficient use of energy and reduction in the cost of electricity used in such buildings be metered to the maximum extent practicable.” Therefore, the installation and use of individual meters or advanced metering devices and smart metering that provide data at least daily and that measure at least hourly consumption of electricity should be examined or evaluated.

v. Storm Water Drainage: The State may program up to three percent of the basic building cost for retention ponds as part of a storm water pollution prevention program. The storm water pollution prevention program and retention ponds must be implemented and constructed in accordance with federal, state, and local regulations. These ponds may include bio-retention capabilities if required by local codes and/or best management practices.

w. Facility Support Space. All facilities are authorized support space allowances as shown in Table 1-7:

Table 1-7. Facility Support Space Allowances

Facility Maintenance and Storage Space(s)	3% of the Total Net Area
Mechanical/Electrical Room (s)	5% of the Total Net Area <u>1/</u> <u>2/</u> <u>3/</u>
Telecommunications/Information Technology	1% of the Total Net Area <u>1/</u>

Notes:

1/ Mechanical/Electrical and Telecommunications/Information Technology rooms may be increased or decreased based on actual design requirements or to provide sufficient space for required secure information technology systems.

2/ Mechanical space includes pipe and duct shafts and perimeter heating units. Additional mechanical equipment space is authorized for multiple story facilities to accommodate vertical duct requirements. This space is understood to include space for computerized controls and equipment for all facility related systems. The percentage indicated is intended as a planning guide. Final determination will be approved during the design review process.

3/ Exclusive of facility maintenance and storage space allocation

x. Inter-functional Circulation Space. Facilities are authorized space for inter-functional circulation as shown in Table 1-8:

Table 1-8. Inter-functional Circulation

Facility Type	Allowance
Readiness Center	15 % (22 % for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within the readiness center) <u>1/</u>
Logistics Facility USPFO Admin Offices USPFO Warehouse Office/Shop Areas in SEMF Unheated Vehicle Storage BII Warehouse Firefinder Radar Facility Controlled Humidity Preservation (CHP)	15% (22% for multiple-story facilities) <u>1/</u> None (already included in base allocation) 15% (22% for multiple-story facilities) <u>1/</u> <u>2/</u> None None Based on A-E design and ARNG-ILI/ILS Approval. None
Aviation Facility	15% (22% for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within aviation facility) <u>1/</u> <u>3/</u>
Training Center Facility	15% (22% for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within heated buildings) <u>1/</u> <u>4/</u>
Educational Facility	22% (29% for multiple-story facilities) of the total net floor area (excluding unheated unit storage, unless it is incorporated within heated buildings) <u>1/</u> <u>4/</u> <u>5/</u>

Notes:

1/ This allowance includes corridors, staircases, entrances, and a lobby. This percentage is a planning figure, and final determination will be approved during the design review process based upon what is required for a well planned functional layout.

2/ This allowance does not include egress for maintenance bay areas (see paragraph 3-3.d. (5)).

3/ Inter-functional circulation for unheated aircraft storage hangars does not fall under this authorization.

The total floor area may be increased by 15% for unheated aircraft storage hangars to provide for egress, interior aisles, hangar doors, walls and interior partition walls

(if required). The 15% figure is intended as a planning guide. Final determination will be made during the design review process.

4/ Circulation is 22% (27% for multiple story buildings) for billeting facilities.

5/ Circulation is 29% (36% for multiple story buildings) for billeting facilities.

y. Walls. Facility allowances for wall space are as shown in Table 1-9:

Table 1-9. Walls

Walls	10 percent of total net floor area, including circulation <u>1/</u> <u>2/</u> <u>3/</u>
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Notes:

1/ The total floor area may be increased by 10 percent to provide for interior and exterior walls and partitions. The 10 percent figure is intended as a planning guide. Final determination will be approved during the design review process.

2/ For Aviation Facilities, the total floor area may be increased by 10 percent (15 percent for stand-alone fixed wing facilities) to provide for interior and exterior walls and partitions. The 10 percent (15 percent for stand-alone fixed wing facilities) is intended as a planning guide. Final determination will be made during the design review process.

3/ For Aviation Facilities, the total floor area may be increased by 15 percent for unheated aircraft storage hangars to provide for egress, interior aisles, hangar doors, walls and interior partition walls (if required). The 15 percent figure is intended as a planning guide. Final determination will be made during the design review process.

z. Controlled Waste Handling Facility (CWHF).

(1) A prefabricated metal or concrete masonry building with a concrete floor or building of equivalent or less cost of a size shown in Table 1-10 below is authorized for all facilities. The basic allowance is the gross area including intracirculation. Intercirculation space has to be justified as an exception to criteria.

(2) The building shall be designed to allow wastes to be conveniently stored inside each cell in drums, metal boxes, on pallets, and easily loaded/unloaded using a forklift or manual means. Partitioning of individual storage cells shall be designed to provide secondary spill containment within each cell.

(3) 150 square yards of rigid concrete access paving may be provided for access. All Facilities are authorized space for a CWHF as shown in Table 1-10:

Table 1-10. Controlled Waste Handling Facilities

Facility	Barrels stored	Basic Allowance <u>1/</u>
Readiness Centers <u>1/</u>	1-40	300
USPFO <u>2/</u>		
SEMF <u>2/</u>		
Aviation Facilities <u>3/</u>	41 & Over	500
Training Center		
Facilities		
Educational Facilities		

Notes:

1/ At its option the State may include this authorized space within the readiness center or another adjacent facility.

2/ At its option the State may include this authorized space within the logistics facility or another adjacent facility. It is additive to any allowances authorized for Surface Equipment Maintenance Facilities (SEMF).

3/ At its option the State may include this authorized space within the aviation facility or another adjacent facility.

Chapter 2

Readiness Centers

2-1. General

Readiness Centers are facilities constructed to support individual and collective training, administrative, automation and communications, and logistical requirements for the ARNG. Functional areas included in this building are assembly space, classrooms, distance learning centers, locker rooms, physical fitness area, kitchen, weapons and protective masks storage, other storage, enclosed areas to support training with simulation, operator-level maintenance shop for assigned equipment, and use of NBC equipment.

2-2. Standards

This chapter establishes the space allowances for National Guard Readiness Centers (CATCD 17180), National Guard/Reserve Centers (CATCD 17142) which includes Joint Force Headquarters (JFHQ), sole use ARNG space in Armed Forces Reserve Centers (AFRC) (CATCD 17141), and Civil Support Team (CST) Ready Buildings (CATCD 14132). Below are the descriptions of the facilities reference above:

- (1) A National Guard Readiness Center is a readiness center facility constructed for sole-use of ARNG.
- (2) A National Guard/Reserve Center is a readiness center constructed as a joint-use facility with another reserve component element (including the Air National Guard) where the ARNG is the lead agency (Host). A National Guard/Reserve Center must provide space for at least 20 members from each of one or more reserve component units in addition to the ARNG.

- (3) A JFHQ is specific type of National Guard/Reserve Center constructed as a joint-use facility for ARNG and ANG federal elements of the Joint Force Headquarters-State and associated State elements as allowed by State statute. There is only one JFHQ per State/Territory/District of Columbia (54 total).
- (4) An AFRC is a reserve center constructed as a joint-use facility with the US Army Reserve where the USAR is the lead agency (Host) and where the ARNG is a tenant of the facility.
- (5) A Ready Building is a building used by a CST Team. The building provides billeting and/or operational areas for civil support teams, missile site crews, units on standby for rapid deployment, or security forces not permanently stationed at the site

2-3. Standard Space Allowances

- (1) Refer to Table 2-1 for standard space allowances.
- (2) Refer to Table 2-2 for unit specific space allowances.
- (3) Refer to Table 2-4 for Civil Support Team facility allowances.
- (4) Refer to Table 1-5 for allowances for Flagpoles.
- (5) Refer to Table 1-7 for Facility Support Space allowances.
- (6) Refer to Table 1-8 for Circulation allowances.
- (7) Refer to Table 1-9 for Walls allowance.
- (8) Refer to Table 1-10 for Space allowances for Controlled Waste Handling Facilities (CWHF)
- (9) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify such requests and the NGB proponent must concur with them before ARNG-ILI will approve including them in the programming documents and the final design of the project.

2-4. Non-Standard Supporting Items

In planning the functional arrangement of facilities, the State shall give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The following exterior Non-Standard Supporting Items are authorized for Federal reimbursement in readiness center projects:

- (1) Parking pad for Mobile Conduct of Fire Trainer (MCOFT) and similar simulators.

Federal support is authorized for construction of a 60 x 60 square feet rigid concrete parking pad, with electrical power and telephone service, at each Army Training Division (ARNG-TR) approved MCOFT or similar simulation device site. A roof-type cover may be provided if required by local climatic conditions (e.g., excessive heat, snow, rain).

- (2) Helipad.

Federal support is authorized for construction of a helipad at the Joint Force Headquarters (JFHQ) or at a readiness center that has a Colonel or higher level command. Constructed of reinforced concrete, the limited use pad shall be 100 x 100 square feet with 25 foot wide shoulders of flexible pavement. Lighting and markings shall conform to the requirements of TM 5-811-5.

2-5. Unheated Enclosed or Shed-Type Vehicle Storage Space

Refer to section 1-9b.

2-6. Civil Support Team Facilities

These facilities are classified as ready buildings and the space allowances are authorized as shown in Table 2-4. Critical to these teams are the operations center/crew room and vehicle storage/ready bays for the loading and pre-staging of sensitive equipment on the unit's primary vehicles.

2-7. Sensitive Compartmented Information Facilities (SCIFs)

SCIFs are only authorized by an Exception to Criteria (ETC). The State must request authorization for a SCIF from the ARNG-G2. The ARNG-G2 will determine if the State has a valid requirement for a SCIF and, if so, will define the authorized space according to the mission. The State will then provide the ARNG-G2 approval documents to ARNG-ILI-R as supporting documentation with the request for ETC. Contact ARNG-ILI-C for specific construction issues and sample SCIF design layouts. Refer to UFC 4-010-05, Sensitive Compartmented Information Facilities Planning, Design, and Construction for more information.

Table 2-1. Schedule I, Readiness Center Space Allowances

Allowances Based on Readiness Center Capacity (Allowance in net square feet, exclusive of interior and exterior walls)							
(Required Strength) <u>1/</u>							
Functional Areas <u>2/</u>	55-99	100-175	176-350	351-650	651-950	951-1,200	
1 Assembly Hall	5,400	5,400	5,400	6,300	6,300	6,300	
2 Classrooms <u>3/</u>	800	1,000	1,500	2,400	2,700	3,000	
3 Learning Center <u>4/</u>	500	500	500	700	700	700	
4 Multipurpose Training Area <u>5/</u>	1,500	1,500	1,500	1,500	1,500	1,500	
5 Kitchen <u>6/</u>	1,500	1,500	2,200	2,200	2,200	2,200	
6 Break/ Vending	<u>7/</u>	<u>7/</u>	<u>7/</u>	<u>7/</u>	<u>7/</u>	<u>7/</u>	<u>7/</u>
7 Toilets/Shower <u>8/</u>	1,220	1,300	1,400	1,620	1,860	2,060	
8 Flam Mats. Storage	100	100	200	200	350	400	
9 Lactation Area/Room	80	80	80	80	120	160	
10 Family Readiness Office	250	250	250	400	400	400	
11 RAPIDS Office <u>9/</u>	150	150	150	150	150	150	
12 Retention Office <u>10/</u>	110	110	110	110	110	110	
13 Table/Chair Storage	300	300	300	550	550	550	
14 Physical Fitness <u>11/</u>	600	700	800	1,000	1,225	1,600	
15 Controlled Waste Handling Facility (CWHF)	<u>12/</u>	<u>12/</u>	<u>12/</u>	<u>12/</u>	<u>12/</u>	<u>12/</u>	<u>12/</u>

Notes:

1/ The required strength of a Readiness Center is the sum of the authorized strengths of all assigned units. Units with required strength(s) of fewer than 55 are not authorized a separate facility and must be programmed as part of a multiple-unit readiness center, unless approved as an exception to criteria. Multiple-unit readiness centers do not require a single unit with a required strength of 55, rather a combined total required strength of 55. Exclusive use space for such units will be according to Table 2-2.

2/ All functional areas listed in Table 2-1 are for the common use of all the units assigned to the Readiness Center.

3/ Classroom space is authorized using the formula 10 square feet per person based on the combined required strengths of the assigned unit(s) (including units with a strength less than 55) that are required to train simultaneously, plus the basic space from the table. An auditorium with inclined floor and installed seats is authorized for battalion or higher level headquarters. Auditorium space is subtracted from the authorized classroom space. All audio/visual equipment will be stored in this area

4/ The Learning Center is a combined space consisting of the library, learning center, and Distance Learning Center (DLC). If a DLC is validated and approved by the ARNG-TR-, it will be installed within this space. No additional space will be authorized for the DLC. Learning Center space is in addition to any classroom space otherwise authorized.

5/ Space authorization will accommodate marksmanship trainers, combative rooms, and any other special trainers required by unit(s). This space will also accommodate all training aid storage requirements for the facility.

6/ Units that do not have a cook section will be allowed to build an 800 SF serving/catering kitchen. A 150 SY concrete pad located in the vicinity of the kitchen is authorized for a Mobile Kitchen Trailer (MKT). NGB DG 415-1, Appendix B lists approved layout drawings and equipment.

7/ Break and Vending areas are now combined spaces with a minimum allowance of 300 square feet for up to 8 full-time support personnel and 400 SF for support personnel of 9 and above. Break and vending areas can be disbursed through the facility.

8/ In addition to the basic toilet area, shower space is also authorized. Shower area shall be determined using the largest number of soldiers required to train simultaneously at the readiness center. This number shall be divided by 15 and the result multiplied by 40 square feet. This figure should then be added to the basic allowance in Table 2-1. The toilet/shower allowance is to be split into appropriate facilities to support both males and females. The split should account for both minimum code requirements and anticipated building usage. The basic allowance may be increased by ten percent (10%), if the facility has two or more floors, in order to allow a toilet area to be installed on each floor.

9/ Space authorized only if Real-Time Automated Personnel Identification System (RAPIDS) office assigned to the

readiness center. Only one RAPIDS office is authorized per campus/training site.

10/ Retention office SF is based on a AR 405-70 category P5 at 110 SQFT is authorized at one per facility, plus an additional 110 SQFT office per unit over 55.

11/ Physical Fitness area in not authorized if a campus/training site physical fitness facility exists and a Memorandum of Agreement (MOA) between the installation commanders and unit exist.

12/ See Table 1-9 - CWHF.

**Table 2-2. Schedule II, Unit and Special Space Allowances 1/
(Allowance in net square feet, exclusive of interior and exterior walls)**

1. Administrative Office Space: 2/

Functional Area	Allowance
a. Basic Allowance	
(1) Unit with strength of 75 and less	400
(2) Unit with strength over 75	800
b. Office Allowance <u>3/</u>	
c. Special Administrative Allowances: <u>4/</u>	
(1) Division Headquarters	5,850
(2) Brigade Headquarters	3,300
(3) Echelons above Brigade Units	2,850
(4) Special Operation Groups	1,950
(6) Battalion Headquarters and Headquarters Company (HHC or HHD)	1,500
(7) State Headquarters (Army National Guard)	<u>5/</u>
Under 4,000 Strength	2,970
4,000 to 7,500 Strength	3,570
7,500 to 10,000 Strength	4,020
10,000 to 15,000 Strength	4,470
15,000 to 20,000 Strength	4,920
Over 20,000 Strength	5,670
(8) Troop Command	
54 or Less Strength	1,950
55 to 99	2,850
100 and Over	3,300
(9) Army Advisor's office for advisors (officers and enlisted) authorized to specific units)	130 each
(10) Personnel Services Companies/Sections	<u>6/</u>
(11) State Headquarters military record archives	<u>7/</u>
(12) Training Support Brigade (TSB) personnel authorized to specific units	130 each

2. Unit Storage Space (minus Arms Vault) 8.1.a/

Functional Area	Allowance
a. Arms Vaults	<u>8.1.b/</u>
b. Battalion Headquarters with Organic Subunits (Per Table of Organization and equipment (TOE) <u>9/</u>	1,000
c. Supply and Transportation Battalion (Division) <u>9/</u>	1,000
d. Support Battalion (Separate Brigade) <u>9/</u>	1,000

3. Locker Room Space 10/

Functional Area	Allowance
a. Basic Space (one per readiness center)	200
b. Space per each individual authorized in the readiness center	18

4. Special Functions:

Functional Area	Allowance
a. JFHQ Joint Operations Center (JOC)	1,200
b. JFHQ Secure Video Conference Center	500
c. Ready Bay for JFHQ Secure Communications Vehicle	1,500
d. Public Affairs Detachment (Specialized functions are allowed space for workroom, recording studio, edit studio, broadcasting studio, finishing room, print room, negative room (dark room), etc.)	1,020
e. JFHQ Photographic Studio <u>11/</u>	500
f. JFHQ Media Room <u>12/</u>	820
g. Medical Section within a Headquarters unit	400
h. Physical Exam/Flight Surgeon Space for 10-160 Exams per Year <u>13/</u>	500
i. Communications Security (COMSEC) Material	<u>14/</u>
j. Information Technology (IT) Support Activities	<u>14/</u>
k. General Purpose Training Bay (GPTB)	<u>15/</u>
l. Air/Army National Guard Weather Flight <u>16/</u>	1,500
m. Band	<u>17/</u>
(1) Main Rehearsal Studio <u>18/</u>	1,700
(2) Large Group Rehearsal Studio <u>19/</u>	700
(3) Small Rehearsal Studio <u>20/</u>	350
(4) Music Library	500
(5) Individual Instrument Storage <u>21/</u>	520
(6) Recording Studio <u>22/</u>	250
(7) Bulky Instrument Storage/Instrument Cleaning and Repair <u>23/</u>	1,200
(8) Individual Practice Rooms <u>24/</u> , <u>25/</u>	870

Notes:

1/ The appropriate space for each unit is to be selected from below and subtotaled by unit per each function. Space for headquarters, special units, or other elements having special requirements not specifically established in this schedule may be submitted to ARNG-ILI for approval as an exception to criteria if supported by a clearly stated justification that is backed up by actual data (if appropriate). The word unit, when not further modified, is intended to represent MTOE units, Table of Distribution and Allowances (TDA) units, split units, and detachments.

2/ The State uses the sum of total of all administrative space authorized for the units and lays out the work areas according to accepted guidelines.

3/ Refer to Army Regulation (AR) 405-70, Table D-1 and D-2 for private and open office space allowances.

4/ Special administrative allowances include a secure planning/briefing room, conference/meeting rooms, operations center, files/supplies storage, etc.

5/ The allowance shown in the table for JFHQ space already includes the following: 100 square feet for COMSEC supplies/equipment; 120 square feet for a terminal room for the Worldwide Military Command and Control System (WWMCCS); and 200 square feet for the terminal room for on-line secure interactive system support.

6/ For a records storage area, you are authorized in square feet the total required strength for all assigned units divided by 20.

7/ For military records archives storage area, you are authorized in square feet the total required strength for all assigned units in the state divided by 4.

8/ Unit storage space shall be computed based on authorized strength of, and cubage of the equipment (excluding

vehicles/equipment provided space under military equipment parking, other items normally stored outside and provided space elsewhere, and individual clothing and equipment) authorized to the unit(s) assigned to the facility.

- a. Each unit or detachment with a required strength of 55 or more is authorized:
 - (1a) Heated storage space. A net area of 2,700 square feet within the readiness center facility is authorized for an equipment cubage of 0 to 4,000 cubic feet.
 - (1b) Arms Vaults. One vault (600 square feet) for every unit greater than 12.
 - (2) Unheated storage space. If total equipment cubage exceeds 4,000 cubic feet, a detached building or an equivalent area incorporated within the readiness center facility is authorized based on one of the following applicable categories:

Total Cubage In Cubic Feet	Net Square Feet (NSF) Authorized
4,001 to 8,000 NSF	= 0.6 x (Total Cubage minus 4,000)
Exceeds 8,000 NSF	= 2,400 + [0.2 x (Total Cubage minus 8,000)]

- b. Each unit or detachment with a required strength of less than 55 but greater than 10 is authorized:
 - (1) Heated storage space. A net area (minimum of 1,300 square feet) within the readiness center facility for an equipment cubage of 0 to 4,000 cubic feet as determined by the formula listed below.

$$\text{Heated Storage} = 0.6 \times \text{Total Cubage}$$

- (2) Unheated storage space. If total cubage exceeds 4,000 cubic feet, use the appropriate applicable category referenced above in Note 8a (2).

9/ This 1,000 square feet authorized for the battalion supply area is intended for a temporary storage area of supplies in transit to and from organic subunits. Shelving for this area is authorized. Vaults or improved office space are not authorized. However, a wire cage partition may be erected to give security to more sensitive supplies. For the Supply and Transport Battalion (Divisional) and the Support Battalion (Separate Brigade) this 1,000 square feet is only authorized for units that have a fulltime functioning supply support activity (SSA) and is intended for a temporary storage area of supplies in transit to and from organic units within the Division or Separate Brigade.

10/ Space may be divided, provided that the total of the separate space allocated to men and women is within the total space authorized. Also, a part or the total area may be used as unit storage space.

11/ A photographic studio (20' x 25' with an approximate 10 foot ceiling height) is authorized in JFHQ readiness centers that do not have a collocated Public Affairs Detachment with a video mission.

12/ In addition to the basic allowance, an additional 60 square feet is authorized for each statewide media outlet in excess of 12. In addition, the JFHQ assembly hall is authorized additional electrical, phone, and data outlets, air conditioning, and special acoustical treatment to make it conducive for use as a media room in case a briefing exceeds the size of the regular media room.

13/ Not more than one examination facility shall be authorized in a single readiness center.

14/ This item refers to communications security and other information technology items (e.g., computer hardware) unique to specific units. IT space allowance to be determined in coordination with State J-6 and the Army National Guard Information Technology Plans, Policy, and Resource Division, Governance and Policy Branch (ARNG-IMG-G) prior to the submission of programming documents. Joint Force Headquarters are authorized 175 square feet for a vault to store cryptographic, encryption, tape backups, and other secure J-6 materials. Joint Force Headquarters also require sufficient space to run the communications hub for the State, a help desk for the State, and to do IT repair. For planning purposes this will probably be at least 7,000 square feet, but the exact amount must be coordinated between the State J-6 and ARNG-IMG-G prior to the completion of the DD Forms 1390/1391 during the charrette process.

15/ Readiness Centers: For Readiness Centers that are not in a Complex or are located more than a mile radius to a Surface Equipment Maintenance Facility (SEMF), such as Field Maintenance Facility (FMS), the RC projects are authorized one General Purpose Training Bay (GPTB). The GPTB is configured the same as a SEMF General Purpose Work Bay (GPWB) plus egress aisles. Paragraph 3-3.d. describes a GPWB. Paragraph 3-3.d. (5) describes egress aisles. For Readiness Centers located within a Complex or within a distance less than 1 mile radius to a SEMF, the adjoining SEMF will be modified to add an (attached or unattached) GPTB.

The GPTB designated for a Readiness Centers that supporting units with a MTOE maintenance section or personnel is authorized the following if validated and approved by ARNG-ILI:

- o Compressed air delivery system
- o Vehicle exhausts evacuation system
- o Electrical and IT Ports
- o A trench/floor drain connected to an oil-water separator

- o Waste oil/hazardous materials storage as required but not to exceed 100 sf.
- o Required safety and/or hygiene equipment (i.e. emergency eyewash stations, hand wash facility, etc.)
- o A 15-ton traveling bridge crane may be authorized based on unit mission.
- o In addition, each unit with a MTOE maintenance section or maintenance personnel of 4 or greater stationed at the Readiness Center in ASIP are authorized:
 - Supervisor's office: 100 square feet.
 - Inspections and library: 110 square feet.
 - Tool room: 300 square feet.
 - Supply room: 300 square feet.
- o Any other areas required by the unit's mission must be justified as exceptions to criteria.

16/ Add 200 square feet for: a Representative Weather Observation Station (RWOS). See UFC 3-260-01.

17/ All spaces are required in the dimensions shown. If any spaces are omitted, corresponding adjustments to other spaces will be required to accommodate personnel and equipment required for mission capability.

18/ Average ceiling height of 20 feet to 30 feet s recommended, with 18 feet as a minimum. Minimum wall length is 30 feet.

19/ Average ceiling height of 18 feet recommended, with 15 feet as a minimum. Room should not be square.

20/ Minimum wall length is 15 feet, to allow for work space and storage.

21/ Requires 65 feet of linear storage for: instrument lockers. If this space is omitted, main rehearsal studio must be increased in size by 520 net square feet.

22/ Minimum width is 10 feet. The recording studio must have visual contact by means of soundproof glass or video camera with the main rehearsal studio. Visual contact with the large group rehearsal studio is highly desired.

23/ This area may be combined with individual instrument storage.

24/ In combination of large (80-125 net square feet) and small (55-65 net square feet) individual soundproofed rooms.

25/ Commercially available soundproofed prefabricated modules may be used, particularly in cases of renovation/renewals.

Table 2-3. Schedule II, Physical Exam/Flight Surgeon Space Allowances

(Allowance in net square feet, exclusive of interior and exterior walls) Functional Area 1/

Functional Area	161-320	321-640	641-1280
1. Reception, Waiting and Form writing	210	280	350
2. Doctor's Office <u>2/</u>	80	80	160
3. Exam Room <u>3/</u>	220	330	550
4. History Station	70	70	105
5. Height & Weight	70	70	70
6. Blood Pressure and Pulse Station	70	70	70
7. Electronic Consult System	<u>4/</u>	110	110
8. Lab	70	70	70
9. Blood Specimen Collection	70	70	70
10. Specimen Toilet	36	36	60
11. Vision Test <u>5/</u>	70	70	70
12. Hearing Test	90	150	210
13. Dental Check <u>6/</u>	100	100	200

Notes:

1/ These functional areas are based on exams per year. These facilities shall not be authorized unless establishment of examination facilities has been approved by the Office of Chief Surgeon (ARNG-CSG). (See UFC 4-510-01) Not more than one examination facility shall be authorized in a single readiness center. Sizes are based on operation of the facility at least 15 days per year.

2/ 80 square feet for each doctor.

3/ 110 square foot room minimum. One room may be used for consulting, review of completed physical examination paperwork, weight control counseling or similar purposes.

4/ Electronic Consult System (ECS) and Tonometry Station will be in the Exam Room when under 320 exams per year

5/ An additional 140 square feet is authorized to accommodate eye examinations if the facility is authorized to conduct flight physical examinations. The circulation space should then be increased by 20 square feet because of the additional 140 square feet for the eye examinations.

6/ 100 square feet minimum per area.

**Table 2-4. Civil Support Team Facility Allowances
(Allowance in net square feet, exclusive of interior and exterior walls)**

Functional Area	Allowances
1. Classrooms/Library <u>2/ 3/</u>	1,050
2. Training Aid Storage <u>2/</u>	80
3. Break Room (Area) <u>2/ 3/</u>	662
4. Vending Area <u>2/ 3/</u>	75
5. Toilets/Shower <u>1/</u>	600
6. Flammable Materials Storage <u>2/</u>	100
7. Table/Chair Storage <u>2/</u>	80
8. Physical Fitness <u>2/ 3/ 4/</u>	600
9. Ready Bays	6,200
10. Ops Center <u>2/</u>	680
11. Admin Space General <u>2/</u>	<u>5/</u>
12. Admin Space Special <u>2/</u>	650
13. COMSEC <u>2/</u>	420
14. Storage <u>2/</u>	2,400
15. Lockers <u>2/</u>	992
16. Laundry <u>2/</u>	120
17. Medical Support/Storage <u>2/</u>	200
18. Equipment Maintenance <u>2/</u>	1,000
19. DECON Room <u>2/</u>	100

Notes:

1/The toilet/shower allowance is to be split into appropriate facilities to support both males and females. The split should account for both minimum code requirements and anticipated building usage. The basic allowance may be increased by 10%, if the facility has two or more floors, in order to allow a toilet area to be installed on each floor.

2/All equipment, furniture and pre-wired workstations must be obtained with other than Federal construction funds.

3/ If CST is collocated with a Readiness Center, the Classroom, Library, Break Room, Vending Area, and Physical Fitness will not be included as part of the CST portion of the building, but rather will be located in the readiness center.

4/ Physical Fitness area is not authorized if a campus/training site physical fitness facility exists and a Memorandum of Agreement (MOA) between the installation commanders and unit exist.

5/ Refer to Army Regulation (AR) 405-70, Table D-1 and D-2 for Private and Open office space allowances. All 22 members of the CST DO NOT each get 130 SF office space.

Chapter 3 Logistical Facilities

3-1. General

a. Standards. This chapter establishes the space allowances for all ARNG Logistical Facilities construction projects, including the United States Property and Fiscal Office (USPFO).

b. Space allowances.

(1) Logistical Facilities space allowances are based on the authorized strength(s), the numbers, occupational specialties, and job descriptions of full-time personnel, the numbers and types of equipment authorized, and special requirements of the supported units.

(2) Refer to Table 3-1 for USPFO Administrative Space Allowances

(3) Refer to Table 3-2 for Lifting Devices/Cranes

(4) Refer to Table 3-3 for Schedule I, Office, Work, and Personnel Space allowances in Surface Equipment Maintenance Facilities (SEMF)

(5) Refer to Table 3-4 for Schedule II, Work Bay Space allowances in Surface Equipment Maintenance Facilities (SEMF)

- (6) Refer to Table 3-5 for Warm Up Bay allowances
- (7) Refer to Table 1-5 for Flagpole allowances
- (8) Refer to Table 1-7 for Facility Support Space allowances.
- (9) Refer to Table 1-8 for Circulation allowances.
- (10) Refer to Table 1-9 for Walls allowance.
- (11) Refer to Table 1-10 for Controlled Waste Handling Facilities (CWHF) space allowances.
- (12) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify such requests and the NGB proponent must concur with them before ARNG-ILI will approve including them in the programming documents and the final design of the project.

3-2. USPFO Administrative Offices, Warehouses, and Central Issue Facilities (CIF)

a. A United States Property and Fiscal Officer (USPFO) is assigned to each State and Territory for which a federally recognized National Guard has been established. Each USPFO requires a support staff and certain facilities in order to perform his/her primary mission of being responsible for all federal funds and property. These include administrative and office space, warehouse space, a CIF, areas for the temporary storage of military vehicles and equipment prior to issue or turn-in, and parking for employee and visitor POVs.

b. Administrative Area.

(1) The criteria for determining the area(s) authorized to support administrative staff activities for the USPFO are predicated upon a presumption that these areas will be located within the same structure that provides administrative space for the Joint Force Headquarters (JFHQ). This may be accomplished by incorporating the USPFO administrative staffing requirements, as delineated in the JFHQ Table of Distribution and Allowances into the construction plans for the new JFHQ complex or addition to the existing JFHQ structure. However, when the number of full-time administrative employees required by the USPFO exceeds 25 and the operational complexities within a particular State make collocation impractical or impossible to achieve, the State may seek authorization to construct a separate, freestanding USPFO administrative structure. In such a case, the CFMO shall provide substantive documentation to ARNG-ILI in order to validate why collocation is not feasible.

(2) The allowance for the USPFO administrative area is based upon the number of full-time administrative employees, other than those whose duties are directly related to Information Technology (IT) or the receipt, storage, transportation and warehousing of military vehicles, clothing and equipment. Job titles such as IT Specialist, IT Equipment Operator, Supply Technician, Motor Vehicle Operator or Materials Handler exemplify those that would not be classified as administrative. Table 3-1 indicates how this space is to be calculated.

(3) State employees and/or contractors who are hired by the state to provide liaison between the State and the USPFO are not considered to be USPFO staff. Thus, they are neither added to nor subtracted from the number of full-time administrative positions required by the particular USPFO staffing document.

(4) Administrative space includes all functional areas needed for the performance of administrative functions and those areas required to support the personnel performing those activities. These spaces include administrative offices, record storage areas, a single classroom and briefing area (if the administrative area for the USPFO is not within the same structure or collocated with the JFHQ, additional space is authorized), a conference room, an employee break room, latrine/shower/locker rooms, mechanical/electrical/telephone/IT spaces, custodial storage, and intra-office circulation.

(5) Wherever possible, construction of private offices and areas enclosed by walls should be kept to a minimum consistent with operational needs for privacy of communication and/or security. The use of individual and collective work spaces is to be maximized.

Table 3-1. USPFO Administrative Space Allowances

Staffing Level	Basic Allowance	PLUS Additional Space (SF) of:	PLUS Additional Space (SF) of:	PLUS Additional Space (SF) of:	PLUS Additional Space (SF) of:
1-25	5,000 SF	N/A	N/A	N/A	N/A
26-60	5,000 SF	200/person>25	N/A	N/A	N/A
61-100	5,000 SF	7,000	175/person>60	N/A	N/A
101-200	5,000 SF	7,000	7,000	165/person>100	N/A

201-300	5,000 SF	7,000	7,000	16,500	155/person>200
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c. Information Technology and Secure Telecommunications Areas. An area of no more than 2,000 square feet is authorized to support IT activities directly related to USPFO operations. This space includes:

- (1) A 150 SF office for the IT manager,
- (2) A 150 SF server room,
- (3) A 150 SF SIPRNET room, and
- (4) One or more storage rooms or areas not to exceed 150 SF total.
- (5) Other IT personnel working area.

d. Warehouse and Loading Dock. Every effort shall be made to incorporate the USPFO warehouse into the same structure as that providing the USPFO administrative space. If this cannot be accomplished, the two shall be placed at minimum practical distance from each other and connected by an enclosed passageway where feasible.

(1) The allowance for net warehousing space for the USPFO, exclusive of the CIF, is a basic allowance of 5,500 square feet for authorized troop strength of 1,000 or less. For an authorized troop strength exceeding 1,000, the basic allowance is 5,500 SF plus 5 square feet for each ARNG Soldier exceeding 1,000 authorized to the State or Territory for the federal fiscal year projected to be the year of construction.

(2) Although the space authorized for the storage of flammable material is included in the overall allowance for USPFO warehouse space, it may not exceed four percent of the total net warehouse space calculated.

(3) The allocation of space for vaults, latrine/shower/locker rooms, a warehouse manager's office, and an employee break room shall be determined based upon Table 3-3. This space, if utilized, shall be deducted from the total net area calculated for the USPFO warehouse.

e. Class VII Storage Areas. An open area not to exceed 90,000 square feet (10,000 square yards) and enclosed by a security fence may be set aside for the temporary storage of vehicles and equipment prior to its disposal or pick-up by the unit to which it is being issued. This area may be paved according to climate force structure, or environmental considerations

(1) This space is in addition to any other areas of pavement authorized for the parking of POV, commercial-type USPFO transport and/or delivery vehicles, etc.

(2) Where a need for additional secure storage area can be documented, such space may be authorized as an exception to criteria.

f. Physical Fitness Room. If the administrative area for the USPFO is not within the same structure or collocated with the JFHQ, additional space is authorized to provide an enclosed and properly ventilated area for the placement of physical fitness equipment for use by all members of the full-time USPFO staff. When there are five or more full-time technicians authorized on the manning document for the USPFO section, a net area of 600 square feet is authorized. For each additional approved full-time technician, that space may be increased by 30 square feet, up to a maximum of 1650 square feet for the entire room. However, when the USPFO offices are collocated within the same structure as the JFHQ, the number of USPFO staff members should be included in the total number of personnel used to determine the size of the physical fitness room within that structure.

g. Central Issue Facility (CIF). The CIF and the USPFO Warehouse should be located within the same structure whenever feasible in order to facilitate the use of a single loading dock. In this case, the CIF shall be constructed as a separate section of the USPFO warehouse separated by CMU blocks or other permanent wall type and must have its own entrance. Alternatively, the CIF may be constructed as a separate or stand-alone building.

(1) Additional space for a CIF is authorized on the basis of 2.2 SF times the number of Soldiers on the ARNG force structure document for the state or territory/DC for the federal fiscal year that is projected to be the year of construction.

(2) A designated clear space, not to exceed 1000 square feet, may be set aside within the CIF for use as a Unit-level show down and layout area. This space comes out of the net area authorized for the CIF.

(3) An area, not to exceed 100 square feet, is authorized to accommodate up to five private dressing rooms of 20 square feet each. Each dressing room shall be provided with lighting but heating, cooling and mechanical ventilation beyond that provided to the general CIF space is not required. This space comes out of the net area authorized for the CIF

(4) An area of 150 square feet may be set aside for the construction of an office for the CIF manager. This space may be increased to a total of 250 square feet if it will be occupied by two individuals. This space comes out of the net area authorized for the CIF.

3-3. Surface Equipment Maintenance Facilities (SEMF)

a. The criteria presented in this paragraph are applicable to all new construction and existing structures intended to function as SEMF.

- (1) Refer to Table 3-3 for office, work, and personnel allowances (Schedule I items).

(2) See Table 3-4 for work bay authorizations (Schedule II items).

b. Tables 3-3 and 3-4 differentiate between field maintenance and sustainment maintenance facilities.

(1) Field maintenance refers to work that is generally performed at a Field Maintenance Shop (FMS), a Unit Training and Equipment Site (UTES), and a Maneuver Area Training Equipment Site (MATES) without Support.

(2) Sustainment maintenance refers to work that is generally only performed at a Combined Support Maintenance Shop (CSMS) or MATES with Support.

(3) Normally, Special Purpose Work Bays (SPWB) will only be incorporated into the design of sustainment maintenance facilities. However, in order to better distribute workload/workforce, a State may elect to tailor an FMS to perform sustainment level maintenance functions. One or more special purpose work bays/areas may be incorporated into the design. The State shall provide the Maintenance Support Plan, manning document, and equipment densities to ARNG-ILI, through ARNG-ILS during the DD Forms 1390/1391 review process to substantiate that those functions will not duplicate similar work performed at an existing or planned sustainment maintenance facility.

c. Office, Personnel, and Work Areas.

(1) The net area in square feet allowed for each functional area is listed in Table 3-3, Schedule I, in the columns under each type of maintenance facility. The office and personnel areas are defined as the CORE area.

(2) If the function is designated NA, that area is not authorized for the facility unless approved as an Exception To Criteria (ETC). All ETCs require final approval of ARNG-ILI.

(3) Some areas sizes are calculated as the sum of the amount in the basic allowance plus the amount listed under the specific facility type or footnote from the appropriate table.

(4) The sizes of some areas are determined by an amount of square feet times a factor, such as the number of general purpose work bays authorized for the shop, federal technicians/Soldiers/employees required to perform the function at the shop, total troop strength supported by the shop, or the number of combat vehicles authorized at the shop.

d. Work Bays.

(1) SEMF work bays are either general purpose or special purpose.

(a) General Purpose Work Bays (GPWB) are those in which mechanics repair, replace, or adjust the operational mechanisms of vehicles and equipment.

(b) Special Purpose Work Bays (SPWB) (see Table 3-4) are those that support a specialized functional area, such as, welding, painting, etc, not general vehicular maintenance.

(2) All work bays at a facility shall be the same size to facilitate design and construction while minimizing construction costs. The bay size shall be 32 feet wide by 64 feet long. This does not include routes of egress. Egress walkways shall not bisect the longitudinal axis of work bays.

(3) The authorized number of GPWB is determined by the number of mechanics required for the facility based upon the surface equipment density. Mechanics are defined as non-supervisory personnel who work primarily in GPWB. The personnel who work in special purpose work areas are not to be used in determining the number of GPWB. The number of authorized GPWB will be determined on the basis of one work bay for every six field or sustainment level maintenance mechanics required. Any fraction of a work bay resulting from this calculation authorizes an additional bay.

(4) No SEMF shall be constructed unless the number of required mechanics justifies two GPWBs. Thus, the construction of a SEMF requires at least seven mechanics, that is one GPWB per six mechanics plus a fraction of a GPWB (approximated to be one GPWB).

(5) A safety walkway (route of egress) shall be provided along the perimeter of each set of two work bays. It shall be four feet wide, except at the interface of the administrative core area and the first work bay adjacent to that core area, where the walkway shall be eight feet wide. Each safety walkway running parallel to the major axis of the work bays shall have a personnel door at either end to provide exit out of the building. The safety walkways that are perpendicular to the major axis of the work bays shall be free of any obstruction caused by a structural member or equipment support column. As detailed in Figure 3-1, safety walkways shall not bisect work bays. This space is not a component of the allowance authorized for circulation, as presented in Table 1-8, and shall not be construed as such.

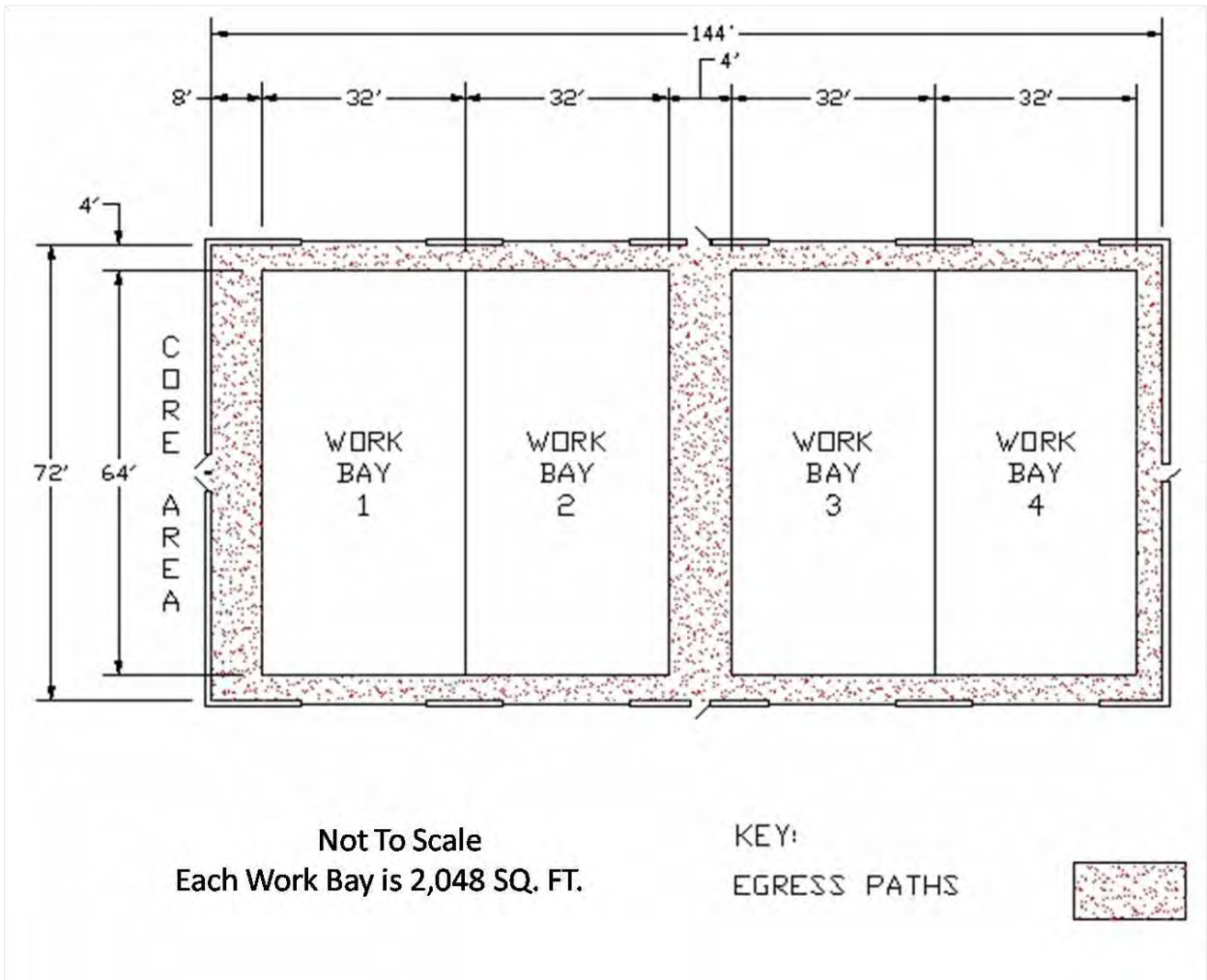


Figure 3-1. Egress & Work Bay Dimensions 1

e. Lifting Devices. When the operation performed in a general purpose or special purpose work bay requires the extraction or lifting of equipment or materials exceeding 50 pounds in weight, appropriate lifting devices are authorized as installed building equipment in the following areas:

Table 3-2. Lifting Devices/Cranes

Work Area	Min. Crane Capacity	Min. Hook Height	Qty	Remarks
GPWB	15 Ton	17 feet	1	Per each 5 work bays or fraction thereof (e.g. 4 work bays are authorized 1 crane, 6 work bays are authorized 2 cranes, etc.). Lifting device(s) should be installed to service 100% of all authorized GPWB areas.
Armament Bay <u>1/</u>	30 Ton	22 feet	1	SEMF supporting M1 Family of Vehicles (FOV) only. Authorized one work bay (preferably an end bay). Should traverse the bay's length to perform maintenance on these vehicles.
Welding Bay <u>1/</u>	7.5 Ton	17 feet	1	
Body Bay <u>1/</u>	7.5 Ton	17 feet	1	If design places Welding and Body Bays adjacent to each other, the state should make every attempt to employ the same device to support both functional areas.
Engine Test Cell <u>1/</u>	5 Ton	14 feet	1	
Transmission Test Cell <u>1/</u>	3.5 Ton	14 feet	1	
Machine Shop <u>1/</u>	1 Ton	10 feet	1	
Radiator Test & Repair <u>1/</u>	0.5 Ton	10 feet	1	
Fuel & Electric Repair <u>1/</u>	0.5 Ton	10 feet	1	
Canvas Shop <u>1/</u>	0.5 Ton	14 feet	1	

Lifting Devices Note:

1/ If shop/area is authorized

f. Other Installed Equipment. NG Pam 415-5, Chapter 4, contains a comprehensive, but not all inclusive listing of equipment by type that may be installed or built into SEMF. States should contact Army Environmental Programs Division (ARNG-ILE) if considering permanently installed pollution prevention equipment.

g. Outside Support Items. Supporting items or specialty areas that may be provided at SEMF are as follows:

(1) Cannibalization Area. An area of rigid pavement equal to the greater of 1,000 square yards or 10% of the area authorized for military vehicle parking and enclosed with a security fence and illuminated by security lights is authorized at CSMS and MATES with Support. If this enclosure is not adjacent to other paved areas, a 20 foot wide rigid paved access road is authorized. For programming purposes, rigid pavement shall be eight inches of concrete. Actual design will be determined by structural calculations.

(2) Vehicle Issue/Turn-in Area. A vehicle issue/turn-in area equivalent to 10% of authorized collocated military vehicle parking is authorized at an UTES or MATES. Area should be level-graded and have an aggregate surface. This area should have suitable security lighting and fencing.

3-4. Unheated Enclosed or Shed-Type Vehicle Storage Space

Refer to section 1-9d(1)v.

3-5. Firefinder Radar (AN/TPQ36, AN/TPQ37, and AN/TPQ47) Facility

- a. Space criteria. Each set is authorized a 20 foot by 40 foot net floor area as a special purpose bay.
- b. Location. This facility may be located either at a surface equipment maintenance facility or at a readiness center, whichever is the most cost effective and practical, but not at both. It should generally be located within a military vehicle parking area or adjacent to some other paved area.
- c. All other space requirements not specifically indicated in this Chapter will be treated as exceptions to criteria. The State must fully justify such requests and the NGB proponent must concur with them before ARNG-ILI will approve including them in the programming documents and the final design of the project.
- d. Facility design. For detailed design guidance, refer to NGB DG 415-2.

3-6. Unheated Controlled Humidity Preservation (CHP) Shelters

- a. Federal support for CHP Shelters is managed by ARNG-ILS-M IAW Memorandum, ARNG-Z of 19 September 2007, and subject: National Guard Bureau Controlled Humidity Preservation Program Policy.
- b. Equipment for preservation will be approved by the ARNG-ILS-M CHP Program Manager (PM) IAW ARNG-ILZ-A approved equipment preservation priorities.
- c. CHP Shelter space shall be unheated and shall be calculated based on the operational shipping configuration of each approved piece of equipment plus one foot in all directions for circulation space.
- d. When enclosed CHP space is provided, the amount of paved area (authorized for parking of military vehicles at the site) shall be reduced by the area of the preservation space.
- e. CHP shelters shall be pre-engineered, un-insulated, unheated, and unlighted metal shelters of a design to accommodate a relative humidity (RH) of less than 50% RH at all times, and less than 40% RH 90% of the time; subject to conditions caused by an act of nature.
- f. CHP Shelters shall not be provided with fresh water or sewer facilities and shall not be used for any purpose other than Controlled Humidity Preservation unless specifically approved by the ARNG-ILZ-A.
- g. CHP Shelters shall be provided with a moisture vapor barrier and concrete floor designed for the heaviest type vehicle to be preserved (eight inches for track vehicles; six inches for wheel vehicles).
- h. Manually operated overhead or rollup doors at each end of the CHP shelter are authorized as follows:
 - (1) Two doors for each 5,000 Square Foot (SF) or 10,000 SF shelter
 - (2) Four doors for each of 15,000 SF; 20,000 SF; 25,000 SF; or 30,000 SF shelters.
- i. A 20 foot deep concrete apron is authorized in front of each vehicle entrance.
- j. Final shelter design shall be as accepted from the contractor by the CHP PM in ARNG-ILS-M and approved by ARNG-ILI.

**Table 3-3. Schedule I, Office, Work, and Personnel Space Allowances in SEMF
(Allowance in net square feet, exclusive of interior and exterior walls)**

Functional Area	Basic Allowance <u>1/</u>	Field Maintenance	Sustainment Maintenance
1. Office Area			
a. General Supervisor	200	<u>2/</u>	<u>2/</u>
b. Supervisor	150	<u>2/ 3/</u>	<u>2/ 3/</u>
c. Production Controller	150	<u>2/ 3/</u>	<u>2/ 3/</u>
d. Inspection & Library	200	<u>4/</u>	<u>4/</u>
e. Administrative Assistant/Secretary	200	<u>2/ 4/</u>	<u>2/ 4/</u>
f. Common IT Space	NA	<u>5/</u>	<u>5/</u>
g. IT Support Activities (Server Room)	NA	<u>6/</u>	<u>6/</u>
h. Classroom	500	10 per Tech <u>7/</u>	10 per Tech <u>7/</u>
i. Conference Room	NA	<u>8/</u>	<u>8/</u>
2. Personnel Area			
a. Latrine/Shower	250	<u>2/</u>	<u>2/</u>
b. Locker Room	125	<u>2/</u>	<u>2/</u>
c. Break Area	400	<u>3/</u>	<u>3/</u>
d. Physical Fitness Area	600	<u>4/</u>	<u>4/</u>

Office Area Notes:

1/ The basic allowance column applies to all surface equipment maintenance facilities. It is additive to any allowances authorized in the columns for field maintenance or sustainment maintenance.

2/ If position or specialty is authorized.

3/ Add 150 square feet for each required position greater than one.

4/ Plus 60 square feet per required position over one.

5/ Each TDA authorized Standard Army Management Information System (STAMIS) terminal supporting maintenance related programs (e.g. SAMS-E, etc.) is authorized 30 square feet and each printer 10 square feet. A copy of the Information Management Plan authorizing equipment should be included with the initial submission of the programming documents (DD Forms

1390/1391). Desktop computers and other pieces of single user information technology equipment are not eligible for additional floor space because they are considered part of the work area for the individual position.

6/ Size to be determined by coordination between State J-6 and ARNG-IMG-G prior to submission of programming documents. Recommend using a planning factor of 150 square feet.

7/ Total classroom size may not exceed 2,000 square feet.

8/ Authorized 400 square feet for facilities with four or more supervisors. None if less than four Supervisors

Personnel Area Notes:

1/ The basic allowance column applies to all surface equipment maintenance facilities. It is additive to any allowances authorized in the columns for field maintenance or sustainment maintenance.

2/ The total space authorized for the men's and women's shower and latrine areas is based on an allocation of 10 square feet for each authorized person plus the basic allowance as stated in the table. The total space allocated for men's and women's locker room is 12 square feet for each authorized person plus the basic allowance as stated in the table. These allowances are to be split into separate areas for men and women that are appropriately sized and configured to meet both local code requirements and anticipated building usage.

3/ The basic authorization is 400 square feet for up to eight full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel requirements, 12 square feet per individual for 21 to 40 full-time support personnel, and eight square feet per individual for full-time support personnel exceeding 40. This space may be a single consolidated area or several smaller break rooms. Refrigerators, microwaves, etc. may be installed in this area, but ranges are not authorized.

4/ The basic allowance is authorized only when there are eight or more full-time technicians required at the SEMF based on equipment density. For each additional required full-time technician over eight, the allowance increases by 30 square feet to a maximum of 1650 square feet.

Schedule I: Table 3-3. Cont.

Functional Area	Basic Allowance <u>1/</u>	Field Maintenance	Sustainment Maintenance
3. Work Area			
a. Tool Room	600	50 per GPWB <u>3/</u>	50 per GPWB <u>3/</u>
b. Supply Room	500	100 per GPWB <u>4/</u>	100 per GPWB <u>4/</u>
c. Battery Room	200	25 per GPWB <u>5/</u>	25 per GPWB <u>5/</u>
d. Comm/Electronic Shop	100	100 per Tech <u>2/</u>	100 per Tech <u>2/</u>
e. Instrument Repair Shop	350	100 per Tech <u>2/</u>	100 per Tech <u>2/</u>
f. Small Arms Repair Shop	125	100 per Tech <u>2/</u>	100 per Tech <u>2/</u>
g. Small Arms Test Room	440	N/A	<u>2/ 6/</u>
h. Vault (Small Arms)	150	<u>2/ 7/</u>	<u>2/ 7/</u>
i. Vault (Combat Vehicle Arms)	130	<u>2/ 8/</u>	<u>2/ 8/</u>
j. Injector Test Room	300	N/A	<u>2/</u>
k. Fuel and Electric Repair Shop	525	N/A	<u>2/</u>
l. BII Storage/Issue	<u>N/A</u>	<u>2/ 9/</u>	<u>2/ 9/</u>
m. Machine Shop	1,600	N/A	<u>2/</u>
n. Carpenter Shop	1,500	N/A	<u>2/</u>
o. Lumber Storage Area	500	N/A	<u>2/</u>
p. Canvas Shop	800	N/A	<u>2/ 10/ 11/</u>
q. Missile Repair Shop	400	N/A	<u>2/ 12/</u>
r. Vault (Missile)	<u>N/A</u>	<u>2/ 13/</u>	<u>2/ 13/</u>
s. Calibration Room	400	N/A	<u>2/</u>
t. Calibration Storage	400	N/A	20 per 1000 Troops <u>2/</u>
u. Glass Repair Room	200	N/A	15 per GPWB>13 <u>2/</u>
v. Radiator Test & Repair Room	660	N/A	<u>2/</u>
w. COMSEC Repair Room	250	N/A	<u>2/</u>
x. Radiation Calibration Room	300	N/A	<u>2/</u>
y. Bulk POL Storage for Lube Sys			
2 to 6 GPWB	80		
7 to 10 GPWB	176		
11 & Over GPWB	272		
z. Bulk POL Storage	200	50 per GPWB>2 <u>14/</u>	50 per GPWB>2 <u>14/</u>
aa. CWHF	<u>15/</u>	<u>15/</u>	<u>15/</u>
ab. Bulky Equipment Storage	200 per GPWB	<u>16/</u>	<u>16/</u>
ac. Flammable Materials Storage	3% of net area	<u>17/</u>	<u>17/</u>
ad. Enclosed unheated storage	250 per WB	150 per WB> 4 <u>18/</u>	150 per WB > 4 <u>18/</u>
ae. Washer Dryer Utility Space	100	<u>19/</u>	<u>19/</u>
af. DSESTS/Fire Control Shop	N/A	N/A	200 per set

Work Area Notes:

1/ The basic allowance column applies to all surface equipment maintenance facilities except as indicated by an NA. It is additive to any allowances authorized in the columns for field maintenance or sustainment maintenance.

2/ If position or specialty is authorized.

3/ This additional tool room space is authorized for each authorized and programmed work bay greater than four.

- 4/ 100 square feet for the first full-time support individual and 60 square feet for each additional full-time support individual assigned as a supply assistant and/or equipment maintenance clerk may be partitioned off as office space. This office may not increase supply room authorization. A covered dock (if justified) or an apron is authorized.
- 5/ Total not to exceed 500 square feet.
- 6/ The net area of the Small Arms Test Room is comprised of a firing area four feet by eight feet, a firing lane tunnel four feet by 82 feet, and a bullet stop area four feet by 20 feet for a total of 440 square feet.
- 7/ The Small Arms Vault should be sized at 20 square feet for each 1,000 troops supported, but not less than 150 square feet.
- 8/ This vault is authorized only at a UTES or MATES. In addition to the basic allowance, an additional 2.5 square feet is authorized for each combat vehicle up to 460, then 1.75 square feet for each combat vehicle over 460, and an additional 0.5 square feet for each authorized M2/M3 (Infantry/Cavalry Fighting Vehicle). Double-leaf vault doors are authorized if materials handling equipment is used.
- 9/ BII not applicable for CSMS. Authorized 21.5 square feet per tracked vehicle and 4.0 square feet per wheeled vehicle. The combat vehicles or wheeled vehicles to be used in computing the total BII space allowance are vehicles authorized to be permanently assigned to the UTES or MATES. The BII storage may be a separate structure and the inside area may be subdivided by wire mesh partitions to segregate by unit level. A 20 foot wide concrete apron with a cover overhead may be installed on one side of the warehouse to load BII with forklifts. The length of the apron shall not exceed the minimum lateral building dimension. A 20 foot by 20 foot covered loading dock is authorized for the BII storage.
- 10/ A pit (approximately six feet square by three feet deep) may be provided in the Canvas Shop to allow the sewing machine to be installed level with the floor. The pit should be enclosed by a removable protective railing.
- 11/ An additional 200 square feet is authorized for each canvas repairman over one.
- 12/ The missile shop area authorization is based only on the largest unit supported, not on the sum of subordinate units supported. If the shop supports a brigade, it receives an additional 200 square feet; if it supports a division, it receives an additional 400 square feet.
- 13/ Vault size is six square feet per supported missile system as documented on equipment density listing. Vault should normally be collocated with the missile repair area.
- 14/ Storage may be freestanding or incorporated into the facility.
- 15/ See Table 1-10 - CWHF.
- 16/ This space is authorized to accommodate bulky maintenance equipment such as tire changers, floor jacks, portable lifts, equipment stands, and welding equipment. This space can stand alone or be incorporated into the GPWB.
- 17/ A detached prefabricated metal or masonry building of equivalent size may be used if this area is not incorporated into the facility. The allowance is 3% of total net area but no less than 100 square feet and no more than 600 square feet.
- 18/ Enclosed unheated storage. Detached buildings may be used, or an equivalent area may be incorporated within the facility to store major end items, items awaiting repair/direct exchange, and Class IX parts that are susceptible to damage from the outside elements. 150 SY of rigid concrete may be provided for access paving to the storage building. The storage area is determined based on the number of authorized field and sustainment maintenance work bays.
- 19/ This space, if utilized, shall be deducted from the facility maintenance and storage authorization in Table 1-7.

Legend for Schedule I

- CV** - Combat vehicles
- CWHF** - Controlled Waste Handling Facility
- N/A** - Not authorized
- Tech** - Full time employee in technician status assigned to the function
- TR** - Authorized aggregate supported troop strength
- GPWB** - General purpose work bay
- SPWB** - Special purpose work bay
- WB** - General purpose and special purpose work bays

Schedule II: Table 3-4

Table 3-4. Schedule II, Work Bay Authorizations for Surface Equipment Maintenance Facilities

Use	Field Maintenance	Sustainment Maintenance
1. General Purpose Work Bay	<u>1/</u>	<u>1/</u>
2. Special Purpose Work Bay	<u>2/</u>	<u>2/</u>
a. Warm-up Bay	<u>3/</u>	<u>3/</u>
b. Welding Bay	<u>1/4/</u>	<u>1/ 4/</u>
c. Body Shop	N/A	<u>1/ 4/</u>
d. Optional Wash Bay	<u>1/ 5/</u>	<u>1/ 5/</u>
e. Paint Stripping Bay	N/A	<u>1/ 4/ 6/</u>
f. Paint Preparation Bay	N/A	<u>1/ 4/</u>
g. Paint Bay	N/A	<u>1/ 4/ 7/</u>
h. Engine/Transmission Test Cell	N/A	<u>1/ 8/</u>
i. Armament Bay	<u>1/4/ 9/</u>	<u>1/ 4/ 9/</u>
j. Inspection Bay	<u>1/ 4/</u>	<u>1/ 4/</u>

Schedule II Notes:

1/ See paragraph 3-3.d. for work bay determination of allowance.

2/ Special Purpose work bays shall be the same size as the general purpose work bays.

3/ Warm-up bays are authorized IAW Table 3-5.

4/ One bay authorized if specialty technicians are authorized to the facility.

5/ A wash bay is optional, but if constructed, it will be in lieu of one exterior wash platform (CATCD 14955).

6/ The net bay size is to be 32 feet by 64 feet (exclusive of safety walkways). The blasting equipment may be programmed from the military construction appropriation. The bay requires its own, adjacent mechanical room of approximately 500 square feet, which is in addition to the mechanical space authorized in Table 1-7. The type of paint stripping equipment must be approved in writing by ARNG-ILI prior to initiating design. The design of this space must be reviewed and approved in writing by NGB Industrial Hygiene (ARNG-CSG-P). Their review will include such aspects as the equipment installed, the methods employed for ensuring adequate air flows, and worker safety in general.

7/ The net bay size is to be 32 feet by 64 feet (exclusive of mechanical equipment). The paint booth may be programmed from the military construction appropriation and should be designed to fit within the bay, incorporating all local codes and regulations. The bay requires its own adjacent mechanical room of approximately 500 square feet, which is in addition to the mechanical space authorized in Table 1-7. In addition to the bay and the mechanical room, a paint kitchen and a personnel hygiene/equipment maintenance area of 180 and 200 square feet respectively are authorized. The design of this space must be reviewed and approved in writing by NGB Industrial Hygiene (ARNG-CSG-P). Their review will include such aspects as the equipment installed, the methods employed for ensuring adequate air flows, and worker safety in general.

8/ Authorized only where justified as a valid mission requirement submitted in writing to and approved by ARNG-ILS-M. If authorized, a total of 2500 square feet are authorized to house a transmission dynamometer test cell, an engine dynamometer test cell, and a control room for each to perform the diagnosis of transmissions and engines. The control rooms may be collocated or separate areas. Additional mechanical space may be provided if required and justified. Dynamometers are authorized for procurement with military construction funds as installed building equipment.

9/ Authorized only for facilities supporting M1 series tanks.

Table 3-5. Warm Up Bays 1/

Number of GPWB	Number of Warm Up Bays
1 – 6	1
7 – 11	2
12 – 16	3
17 or more	4

Notes:

1/ Warm-up bays are authorized for geographic areas where the outside winter design temperature is 12 degrees Fahrenheit dry bulb or less as designated in the Unified Facilities Criteria 3-400-02.

3-7. Bollards

Bollards are authorized to protect maintenance facilities IAW ARNG Design Guide.

Chapter 4 Aviation Facilities

4-1. General

a. Standards. This chapter establishes the space allowances for ARNG aviation facility construction projects.

b. Space allowances. All allowances are in net square feet, exclusive of interior and exterior walls. All Chapter 4 tables except 4-4 apply to facilities supporting either rotary wing aircraft or rotary and fixed wing aircraft. Only Tables 4-4 apply to stand-alone fixed wing facilities.

- (1) Refer to Table 4-1 for Space allowances for hangar floor areas.
- (2) Refer to Table 4-2: for Space allowances for specialized work areas.
- (3) Refer to Table 4-3: for Space allowances for personnel support areas.
- (4) Refer to Table 4-4 for Space allowances for fixed wing facilities.
- (5) Refer to Table 4-5 for Space allowances for unheated aircraft storage.
- (6) Refer to Table 1-5 for allowances for Flagpoles
- (7) Refer to Table 1-7 for Facility Support Space allowances.
- (8) Refer to Table 1-8 for Circulation allowances.
- (9) Refer to Table 1-9 for Walls allowance.
- (10) Refer to Table 1-10 for Space allowances for Controlled Waste Handling Facilities (CWHF)
- (11) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify such requests and the NGB proponent must concur with them before ARNG-ILI will approve including them in the programming documents and the final design of the project.

4-2. Non standard Supporting Items

a. Aircraft parking apron. Outside parking and tiedown spaces are authorized for 50 percent of the authorized aircraft plus one parking/tie down space for transient aircraft (size to be based on CH-47). The layout and dimensions of the aircraft parking and hoverlane/taxilane area shall be according to UFC 3-260-01. Parking and hoverlane/taxilane facilities for aircraft shall consist of rigid concrete. A 20 foot wide access road of rigid concrete is authorized to connect the aircraft parking area to other vehicular pavement and the hangar apron on the site. States should coordinate parking apron layout with ARNG-AV prior to submission of programming documents, especially if they are requesting parking for more than 50% of authorized aircraft.

b. Taxiways. Taxiways of flexible pavement, 40 feet wide, are authorized. They shall be the minimum length required for a practical and economical site layout among hangar ramps, loading area, wash area, parking area, and the nearest exit point connecting to any other existing taxiway or runway system.

c. Shoulders. Aircraft parking ramp and taxiway shoulders of flexible pavement, where authorized in UFC 3-260-01, should be constructed in accordance with NGB DG 415-3.

d. Aircraft wash area.

(1) One aircraft washing apron, category code 11370, is authorized at each aviation facility, to be constructed of rigid concrete according to UFC 3-260-1. Authorized maximum allowance is 118 feet by 74 feet (140 feet by 110 feet if CH-47s). A roof type cover may be provided if required by local code to prevent storm water from draining into the sanitary sewer system.

(2) An exterior wash rack may be enclosed by a heated shed-type structure when the heating design temperature, designated in UFC 3-400-02, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

4-3. Special Aviation Items

Supporting items or facilities that may be provided at aviation facilities, when individually justified to and approved by ARNG-AV, include the following:

a. Aircraft Rescue and Firefighting Facility (ARFF).

(1) One station capable of accommodating assigned/approved apparatus and personnel is authorized when justified as an exception to criteria. This functional area may be located in a separate building or included in the layout of the main building, but is to be readily accessible to the flight line and aircraft parking area.

(2) A basic allowance of 800 square feet net area is allowed for the associated administrative and storage functions. An additional allowance of 800 square feet net area is authorized for each type ARFF vehicle authorized.

b. Ground support equipment (GSE) storage/maintenance area.

(1) Unheated enclosed or shed-type storage is authorized for GSE. A basic allowance of 1200 square feet net area is allowed for 16 or less authorized aircraft. For more than 16 authorized aircraft, an allowance computed at 20 square feet per aircraft over 16 is authorized in addition to the basic allowance.

(2) A heated area of 320 square feet (within the total allowance) may be provided for maintenance of GSE when the heating design temperature at the site is as designated in UFC 3-400-02, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches.

c. Airfield lighting. Pavement marking lights for runways, taxiways, hoverlanes/taxilanes, and aircraft tiedown area shall conform to requirements of TM 5-811-5 (except that, in cases of conflict with Federal Aviation Administration (FAA) guidance, the latter shall govern where the facility is located at a commercial airfield). At the parking ramps and aircraft tiedown areas, perimeter lights must be provided in accordance with TM 5-811-5.

d. Miscellaneous. Additional special aviation items must be justified on an individual basis as essential features, necessary for complete and safe operation of the aviation facility.

e. Special requirements for airfields. Runways, taxiways, aprons, navigational and approach aids, airfield lighting, and other related airfield requirements for aviation facilities non-located with active airfields shall be coordinated with and approved by ARNG-AV prior to submission of programming documents. Refer to UFC 3-260-01 for possible requirements.

f. Aviation Combined Arms Tactical Trainer (AVCATT) Parking Pads. A 35 foot by 70 foot rigid concrete parking pad with electrical power, telephone, and water service is authorized at each NGB approved site permitted an AVCATT location.

4-4. Unheated Enclosed or Shed-Type Storage Space

a. Federal support is authorized for enclosed or shed type storage of military aircraft authorized at an Army Aviation Support Facility (AASF). Refer to Table 4-5 for appropriate allowances. The number of military aircraft for which enclosed storage may be provided shall not exceed allowances provided by the applicable TOE/TDA, less those located elsewhere and those aircraft used to determine main hangar floor sizing. Allowances in this paragraph are in addition to the allowances for aircraft parking as stated in paragraph 4-2a.

b. Unheated enclosed storage is authorized for security and preservation of aircraft and mission accessory equipment per Table 4-2.

c. Federal support for enclosed or shed-type storage is authorized for wheeled vehicles and equipment.

d. Vehicle storage space shall be unheated and shall not exceed 66% of the normally authorized open-air military parking area. When enclosed or shed-type storage is provided, the amount of paved area (authorized for parking of military vehicles at the site) shall be reduced by the area of the covered space. The remaining paved area is to be used for circulation and access to and from the covered/enclosed storage structure.

e. Vehicle doors at approximately 25 feet on centers are authorized at the rate of one for each 1800 square feet of floor area to provide for mass parking of vehicles without the need for internal circulation lanes.

f. A 60 foot long (from the front of the building) concrete apron is authorized the length of each side of the facility with vehicle entrances.

4-5. Security

Aviation facilities are mandated to comply with the requirements of AR 190-51 and DA PAM 190-51 concerning the protection of aviation resources. Reference to these regulations is required to determine appropriate security measures.

Table 4-1. Space Allowances for Hangar Floor Areas ^{1/}

Aircraft Type	Hangar Bay Factor	Hangar Envelope (Per Authorized Bay)		
		Length (FT) ^{2/}	Width (FT) ^{2/}	Allowance (SQFT) ^{3/}
C-12, C-26, C-35	1	70	62	4,340
AH-64, UH-60, UH-72	0.5	70	60	4,200
CH-47	0.5	105	66	6,963

Notes:

^{1/} Hangar floor size in feet and square feet.

a. The hangar floor net area shall be calculated by first multiplying the number of each type aircraft times the hangar factor (average of aircraft expected to be in the hangar for maintenance at a given time) for each aircraft type, rounded up to the next whole number. This will determine the required number of hangar envelopes for each type aircraft to be provided for within the hangar area. Actual square footage of the hangar will be based on logical layout of the aircraft envelopes with appropriate circulation.

b. The actual dimensions of the hangar floor will be based on the smallest rectangular area required to enclose the envelopes of the various type aircraft (with the envelopes arranged for movement of the aircraft in the same direction). In addition, the dimensions of the hangar floor shall include a perimeter wall and door clearance of 5 feet from the rotary wing aircraft envelopes and 10 feet from the fixed wing aircraft envelopes. A single-line drawing of the floor plans shall be drawn to scale on a DD Form 1391C and submitted with the programming documents.

^{2/} Hangar envelope dimensions include aircraft dimensions plus a minimum 5 foot working clearance and egress clearance required between aircraft. Envelope length for rotary wing aircraft (except CH-47) is based on UH-60 length plus 5-foot working clearance.

^{3/} Allowance in net square feet, exclusive of interior and exterior walls and perimeter circulation.

Table 4-2. Space Allowances for Specialized Work Areas ^{1/}

Functional Areas		Basic Allowance	UH-72	AH-64 UH-60	CH-47
1 Drive Train Allied Shops					
	a. Propeller/ Rotor ^{2/}	750	NA	NA	NA
	b. Engine Inspection/Repair ^{3/ 4/}	600	NA	^{5/}	^{6/}
	c. Pneudraulics ^{3/ 4/}	NA	200	300	300
	d. Component Cleaning Area	100	40	40	40
2 Airframe and Structural Shops					
	a. Airframe /Welding /Structural ^{3/}	1650	NA	NA	NA
	b. Composite Materials ^{10/}	200	NA	NA	NA
	c. Paint ^{3/ 7/}	540	NA	NA	NA
	d. Non-Destructive Inspection	400	NA	NA	NA
3 Electronic and Avionics Allied Shops					
	a. Avionics/Instrument ^{4/8/}	600	NA	NA	NA
	b. COMSEC Storage ^{9/}	140	NA	NA	NA
	c. Electrical ^{3/4/}	100	200	250	250
	d. Night Vision Device/ASE shop	200	NA	NA	NA
	e. Arms Vault and Armament Subsystem ^{3/ 11/14/}	600	NA	NA	NA

4	Tech Supply				
	a. Special Tools Room <u>12/</u>	300	100	200	200
	b. Repair Parts Room <u>12/</u>	400	100	200	200
	c. Accessory Equipment TOE/TDA Storage <u>13/</u>	NA	60	100	120
	d. Shipping and Receiving/ recycling	400	NA	NA	NA
5	Contractor Shop/Storage <u>17/</u>	NA	NA	NA	NA
6	Bulk Material Storage				
	a. Bulk POL Storage <u>15/ 16/</u>	150	NA	NA	NA
	b. Flammable/Combustible Storage	<u>15/</u>	NA	NA	NA
	c. Controlled Waste Handling Facility	<u>18/</u>	NA	NA	NA
7	Unheated Storage <u>19/</u>	1000	80	150	250

Notes:

- 1/ Allowances are in net square feet, exclusive of interior and exterior walls. The amount of the basic allowance is added to the amount for the type of aircraft supported at the facility. If there is more than one type of aircraft supported, sum the allowances for each type of aircraft authorized to be supported at the site.
- 2/ Room size (15 feet by 50 feet) is based upon largest rotor blade authorized. A 1000 pound electric hoist on a monorail with trolley assembly extending across the length or width of the room is authorized.
- 3/ Not Authorized for Limited Army Aviation Support Facility (LAASF).
- 4/ Requires a minimum of two aircraft for space to be authorized. The aircraft assigned to any LAASF are to be included in computing the allowance for the supporting AASF.
- 5/ 150 square feet authorized for each increment of 8 aircraft authorized at the site of the construction project.
- 6/ 200 square feet authorized for each increment of 6 aircraft authorized at the site of the construction project.
- 7/ The paint room is authorized for painting component parts, not complete aircraft. A prefabricated paint booth (approximately 8 foot by 12 foot with an opening for exhaust) is authorized to be installed in the paint room for painting of small parts and aircraft components.
- 8/ Basic allowance is for 1 to 30 aircraft. 15 square feet is authorized for each additional aircraft over 30 (up to a maximum of 2,400 square feet). The LAASF avionics/instrument shop and avionics float equipment is authorized a combined total of 300 square feet.
- 9/ Basic allowance is for 1 to 16 aircraft. An additional allowance of 3 square feet is authorized per aircraft for each aircraft over 16.
- 10/ Composite materials work space shall have a down draft work table filtered and vented to the exterior above the roof line.
- 11/ Applies only if AH-64 type aircraft are authorized to be supported at the site.
- 12/ Actual allowance is the basic allowance plus the allowance for each aircraft type. Even though there is only one column for AH-64, UH-60, etc., each listed aircraft is considered a separate type. Office space must come out of the existing allowance.
- 13/ Figure shown represents only the per authorized aircraft figure and base on Cubage for TDA.

$$\text{Heated Storage} = 0.6 \times \text{Total Cubage}$$
- 14/ Additional space may be authorized on an individual basis. A single-line drawing of the floor plan and wall elevations showing the proposed lay-out of the authorized weapons systems, without mounts, shall be drawn to scale on DD Form 1391C and submitted with programming documents. Security of arms vaults and supply rooms must include an intrusion detection system, be in accordance with AR 190-11, and be approved by ARNG-ILI-F. Proponent for approval of additional space is ARNG-AV.
- 15/ A detached prefabricated building of equivalent size may be used if this area is not incorporated into the facility. The allowance is 3% of total net area but no less than 100 square feet and no more than 600 square feet.
- 16/ Increase the allowance 5 square feet for each aircraft authorized to be supported at the site.
- 17/ Per contractor, when authorized contract maintenance. Size: to be determined in coordination with ARNG-AV prior to submission of programming documents.
- 18/ See Table 1-9 CWHF.
- 19/ An unheated storage building for mission and aircraft accessory equipment with area authorized on a per aircraft basis. At its option the State may include this authorized space within the aviation facility or another adjacent facility.

Table 4-3. Space Allowances for Personnel Support Areas

Functional Areas	Allowance ^{1/}	
1. Administrative and Training Area		
a. Security/Entry Lobby	<u>2/</u>	
b. Supervisory Aircraft Pilot	250	
c. Secretary	200	
d. Supervisory Instructor Pilot	2 0 0	
e. Flight Instructor (Safety) <u>3/ 20/</u>	175	
f. Flight Instructors (Aircraft) <u>3/20/</u>	175 each	
g. Administrative Support Area	220	
h. Library/Classroom	400	
i. Learning Center <u>4/20/</u>	300	
j. Simulation Devices <u>20/</u>	<u>5/</u>	
k. Flight Surgeon Administration/Examination Area <u>20/</u>	200	
2. Operations		
a. Operations area <u>6/</u>	1400	
b. Flight Operations Specialist <u>7/</u>	150	
c. Tactical Operations Secure Area <u>8/</u>	240	
d. Safety, Briefing and Examination Room <u>9/</u>	400	
e. Flight Planning	600	
f. Passenger Waiting/Briefing Area <u>10/ 20/</u>	240	
g. Aviation Emergency Operations Center (AEOC) <u>20/</u>	<u>11/</u>	
3. Aviation Life Support Equipment (ALSE) Shop		
a. ALSE Administration Area	150	
b. ALSE Maintenance Support	500 LAASF	1000 AASF
c. ALSE Storage	<u>12/</u>	
4. Maintenance Administrative Area		
a. Flight Engineers (SI/FI)	175 each	
b. Supervisory Maintenance Test Pilot	200	
c. Aircraft Maintenance Supervisors	150 each	
d. Production Controller <u>7/</u>	150	
e. Aircraft Automation Clerk/Clerk Typist	100	
f. Supervisory Supply Technician	150	
g. Maintenance Test Pilots	150 each	
h. Aircraft Inspectors (or Quality Assurance Supervisor and Technical Inspectors)	125 each	
i. Crew Chief Log Area <u>13/</u>	400	
j. Common IT Space	<u>14/</u>	
k. IT Support Activities	<u>15/</u>	
5. Information Technology Space		
a. Common IT Space	<u>14/</u>	
b. IT Support Activities	<u>15/</u>	
6. Locker Rooms <u>16/</u>	400	
7. Break/Assembly Area <u>17/</u>	400	
8. Toilets/Showers <u>18/</u>	500	
9. Physical Fitness Area <u>20/</u>	<u>19/</u>	

Notes:

^{1/} Allowance is in net square feet, exclusive of interior and exterior walls.

^{2/} A Security Entry/Lobby (up to 400 square feet) may be provided within the base facility in lieu of a guard house/access control facility.

^{3/} Basic allowance is for full-time support personnel. An additional 150 square feet is authorized for every two MTOE/TDA instructor pilot authorizations required to drill simultaneously.

^{4/} Basic allowance is for up to 50 crew members. An additional allowance of 4 square feet for each crew member above 50 is authorized.

5/ 100 SQFT is authorized for each training device. AVCATT facilities should be requested as an exception to criteria and approval by ARNG-AV.

6/ Allowance is based on 6 or more authorized aircraft. Decrease allowance to 800 square feet when fewer than 6 aircraft are authorized.

7/ An additional 100 square feet is authorized for every authorized position over one.

8/ This includes tactical operations secure storage, Secure Internet Protocol Router Network (SIPRNET), and Aircraft Survivability Equipment Trainer (ASET) areas.

9/ Authorized an additional 12 square feet per authorized crewmember greater than 20 for the authorized crewmember strength of the largest single aviation element supported. This allowance may be split into separate areas as required to accommodate the listed functions.

10/ If the facility is one story, the passenger waiting and briefing area shall be included with or adjacent to the operations area. If the facility is two stories and the operations area is on the second floor, the passenger waiting and briefing area shall be included on the first floor.

11/ An Aviation Emergency Operations Center (AEOC) of approximately 1200 to 1400 square feet. may be requested primarily for use in emergency situations and for training of battle captains and staff, tactical operations officers, and flight operations personnel. The request must be justified by the state and approved by ARNG-AV. No more than one AEOC per State will be approved. Approval will be contingent upon regional threat potential. The AEOC will require secure construction to accommodate secure communication equipment and flight-related data.

12/ Space authorized for ALSE storage for the particular facility in question is computed using the guidelines below. However, this is a maximum authorization. Actual authorization must be established for each case based on anticipated usage (i.e., how many of these are items actually to be stored, inspected, and repaired at the facility in question).

a. Storage of helmet, vest and gloves: 4 square feet per crewmember in addition to the 10 square feet per person authorized for a locker room for storage of personal flight gear.

b. Storage of individual life preservers: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft. Storage should be in conventional wall lockers at least 5 feet high.

c. Storage of Individual Overwater Survival Kits: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft at a location where flight of 30 minutes or more over water might be required. This is generally applicable to facilities located along the East, West and Gulf Coasts, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Storage should be in conventional wall lockers at least 5 feet high.

d. Storage of Individual Hot Climate Survival Kits: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft at locations in the southwestern U.S., Hawaii, Puerto Rico, and the Virgin Islands. Storage shall be in conventional wall lockers at least 5 feet high.

e. Storage of Individual Cold Climate Survival Kits: 8 square feet for every 8 individuals (crew members and passengers) who can be accommodated on board the authorized aircraft at locations in Alaska and the northern tier of States. Storage should be in conventional wall lockers at least 5 feet high.

f. Storage of 7-Man Life Rafts: To be determined on an individual basis, depending on the equipment actually on hand for utility and cargo aircraft assigned to facilities along the East, West, and Gulf Coasts, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Four cubic feet of storage volume is required for each raft.

g. Storage of Group Survival Kits: To be determined on an individual basis depending on the equipment actually on hand at a given site.

13/ For each aircraft greater than 16 authorized to be supported at the site, an additional 10 square feet is authorized. This space includes publications and Unit Level Logistics System- Aviation (ULLS-A) log book work areas.

14/ Each common use terminal is authorized 30 square feet and each printer 10 square feet. A copy of the Information Management Plan authorizing equipment should be included with the initial submission of the programming documents (DD Forms 1390/1391). Desktop computers and other pieces of single user information technology equipment are not eligible for additional floor space because they are considered part of the work area for the individual position.

15/ Size to be determined by coordination with ARNG-ILI prior to submission of programming documents.

16/ Aviation facility locker space is above and beyond readiness center locker space. In addition to the basic allowance in the table, facility is 12 square feet per individual based on the sum of the total authorized number of crew members and authorized full-time support personnel who are not crew members. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

17/ An additional 20 square feet per person is authorized for 9 to 20 full-time support personnel, an additional 12 square feet per person is authorized for 21 to 40 full-time support personnel, and an additional 8 square feet per person is authorized for full-time support personnel exceeding 40.

18/ In addition to the basic allowance, you are authorized 10 square feet per person for whichever is greater: the largest contingent of authorized crew members training simultaneously, or the sum of the authorized full-time support and contract personnel. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

19/ An additional net area of 600 square feet is authorized for physical fitness equipment when there are 5 or more approved full-time technicians authorized on the TDA. For each additional approved full-time technician, the allowance increases 30 square feet to a maximum of 1,650 square feet. This allowance may be applied within the aviation facility or added to an existing physical fitness facility on the installation.

20/ Limited use facilities (LAASF) do not receive this item unless an exception to criteria is authorized by ARNG-AV.

Table 4-4. Space Allowances for Fixed Wing Facilities

Functional Area	Basic Allowance <u>1/</u>
1. Hangar Floor <u>2/</u>	5950
2. Contractor Shop/Storage <u>3/</u>	800
3. Common IT Space	<u>4/</u>
4. IT Support Activities	<u>5/</u>
5. Aircraft Pilot/Contracting Officer's Representative (COR) <u>6/</u>	175
6. Aircraft Pilot <u>7/</u>	150
7. Flight Operations Specialist	200
8. Passenger Waiting Area <u>8/</u>	400
9. Break/Assembly Area	<u>9/</u>
10. ALSE Storage	<u>10/</u>
11. Locker Room <u>11/</u>	200
12. Toilets/Showers <u>12/</u>	250

Notes:

1/ Allowances are in net square feet, exclusive of interior and exterior walls.

2/ Actual square footage will be layout specific. However, minimum allowance is based on a maintenance area of 60' by 75' plus a 10' safety clearance area between the aircraft and walls. This allowance is only for a single aircraft in a standalone facility. If you desire space for multiple fixed wing aircraft, or if you are combining rotary wing and fixed wing aircraft into a common aviation facility, you must coordinate the applicability of these space allowances with ARNG-AV in advance of submitting your programming documents.

3/ Per contractor, when authorized contract maintenance. Locations with multiple aircraft of the same type shall be authorized 125 square feet per each additional authorized aircraft over 1.

4/ Each common use terminal is authorized 30 square feet and each printer 10 square feet. A copy of the Information Management Plan authorizing equipment should be included with the initial submission of the programming documents (DD Forms 1390/1391). Desktop computers, typewriters, and other pieces of single user information technology equipment are not eligible for additional floor space because they are considered part of the work area for the individual position.

5/ Size to be determined by coordination with state J-6 and ARNG-ILI prior to submission of programming documents.

6/ COR for aircraft maintenance contractor.

7/ Per each authorized full-time support personnel position for the facility.

8/ Authorized for standalone operational aircraft facilities only; space for other aviation facilities shall be derived from authorized circulation space.

9/ 20 square feet per authorized full-time support and contract personnel position, but not less than 200 square feet.

10/ Refer to ALSE Storage, Table 4-3, Note 12, for space allowance.

11/ In addition to the basic allowance in the table, facility is authorized 12 square feet per individual based on the sum of the total authorized number of crew members and authorized full-time support personnel who are not crew members. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

12/ In addition to the basic allowance, facility is authorized 10 square feet per person for whichever is greater: the largest contingent of authorized crew members training simultaneously, or the sum of the authorized full-time support and contract personnel. This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

Table 4-5. Unheated Aircraft Storage Allowances

Type Aircraft	Length	Width	Allowance
C-12D/F/R	50	58	2900
C-12J	64	58	3712
C-26	66	60	3960
AH-64, UH-60, UH-72	70	60	4200
CH-47	105	66	6930

Notes:

1. Allowances are net and exclude all walls. The above dimensions include six feet additional length and six feet additional width, which provide for handling safety clearance zones between each individual aircraft.
2. Facility is authorized an additional three foot wide perimeter egress aisle at the back and left and right side walls surrounding the aircraft modules.
3. Facility is authorized a two foot wall and door thickness around the aircraft modules and egress aisle area.
4. For programming purposes and in lieu of paragraphs b and c above, you may calculate your egress, aisle, wall, and door areas by adding 15% to the total area authorized.
5. Egress, aisle, wall, and door authorizations will be adjusted during design review to reflect actual requirements.

4-6. ARNG Facilities Allowances for TUAS/UAS Ready Buildings (General Information)

4-6.1 Operating Facility:

- a. Standard Design or Sites Adaptable Plan.
- b. Maintenance, Training and Operations Functions
- c. Landing Strip

4-6.2 Training Facilities:

Design Criteria with Facility designed to meet Local Requirements and Conditions, and Use Existing Facilities. Unmanned Aerial Vehicles (UAVs) are remotely piloted or self-piloted aircraft that can carry cameras, sensors, communications equipment or other payloads.

The Tactical UAS (TUAS) – the “SHADOW”

Shadow is typically operated and supported by a platoon of 27 Soldiers. One system includes:

- Four (4) Unmanned Aircraft
- Ground Control System:
- Two (2) HMMWV GCSs
- Two (2) Ground Data Terminals
- Two (2) Base HMMWV for GCS support
- Two (2) Equipment Trailers with 10-kw generators
- Launcher
- Two (2) HMMWV with AVT and two (2) hydraulic launchers
- One (1) HMMWV AVT support vehicle with one (1) Equipment trailer
- One (1) HMMWV Maintenance Section Multifunctional (MSM) with Equipment Trailer

The maintenance storage facility will be laid out to accommodate 3 Shadow 200 airframes and 2 LMTV Ground Control Stations and the Air Vehicle Transport.

Shadow 200 Specifications

- Wingspan: 22 ft.
- Length: 11.8 ft.
- Maximum gross weight: 460 lb.

Tactical Control Station (TCS): The Tactical Control Station is the software and communications links required to control the TUAV, MAE-UAV, and other future tactical UAV's. It also provides connectivity to other C4I systems.

Unmanned Aircraft Systems (UAS) Ready/Building: The larger class UAS (Class III & IV) require obstruction clearances similar to manned aircraft and are generally located at Army Airfields/Heliports. The smaller class UAS are co-located with the parent brigade organization closer to the training complex thereby maximizing "on-station" time for training productivity. *Threshold*: At a minimum, all Class I (manpack) and Class II (generally, 12' wing span/rotor disk or smaller) shall be stored and maintained with the battalion-sized unit they are assigned to. *Objective*: For BCTs, sighting the UAS facility in immediate proximity or direct access to the training area will include the capability to launch and recover UAS from the tank trail or range road whenever land use and obstruction clearances allow.

4-7. ARNG Facilities Allowances for TUAS/UAS Ready Buildings (Design Considerations)

The TUAS/UAS Ready Buildings may be a separate permanent or pre-engineered building, or contiguous with a general warehouse. Design hanger door height to accommodate LMTVs. Plan for a wingspan of 22 feet and length of 11.8 feet.

Aircraft launcher must be at least 100 feet from "occupied areas". Provide a launching pad that can launch in any direction. Size should be approximately 40 feet by 40 feet.

Provide vehicle staging area approximately 100 feet wide by 40 feet long. Comply with FAA 1:7 height restrictions near the runway. Surface in the parking/maintenance bays needs to be the same surface in a light color. Explore usage of swamp coolers in maintenance bay. Design drives to be 24-feet wide. Final design shall be approved by the State Construction and Facilities Management Officer (CFMO).

Table 4-6. ARNG TUAS Facility Allowances (OPTIMUM)

Functional Area	Basic Allowance
No. of Unit Clerks	1
No. of Training Devices	1
No of UAS Airframe	4
1 Administrative Area	700
a. Entry/Security Lobby	200
b. Platoon Leader	120
c. Platoon Sergeant (one per unit)	80
d. Standardization Pilot (one per unit)	80
e. Flight Operations Specialist/Unit clerk (one per unit)	80
f. Administrative Support Area (one per unit)	80
g. Audio/Visual Storage (one per unit)	60
2 Operations Area	1,700
a. Mission/Flight Planning (one per unit)	400
b. Library/Classroom/Briefing/Operator Work Area (one per unit)	600
c. Tactical Operations (Imagery) Secure Area/SIPRNET (one per unit)	100
d. Simulation Training Area (Shadow Crew Trainer) (one per unit)	600
3 Maintenance Area	3,840
a. Contractor office	120
b. Contractor Storage Area / Parts Room (one per unit)	160
c. QC/Prod Control Office/Tech Pubs.	460
d. General repair shop / Tool storage area (one per unit)	400
e. Ground Vehicle parking (140 sq ft / HMMWV) (one per unit)	700
f. Ground Equipment storage (GCS/GDT/launcher) (one per unit)	400

g. UAS parking/maintenance bays (400 SQFT per Airframe)	1600
4 Break/Assembly Area	400
5 Toilets/Showers (one per unit)	400
6 Locker Rooms (one per unit)	686
7 Physical Training Area	600
8 Storage (one per unit)	600
Total TUAS Facility Net Area	8,180
Maintenance and Storage (3% of Net Area)	245
Mechanical/Electrical Room (5% of Net Area)	409
Telecom/IT (1% of Net Area)	82
Circulation Allowance (15% of Net Area/22% for Multi-story)	1227
Structural Allowance (10% of Net Area)	946
Total TUAS Facility Gross Area	11,089

Chapter 5 Training Center Facilities

5-1. General

a. Standards: This chapter establishes the space allowances at ARNG Training Centers, exclusive of space associated with educational facilities. Allowances are based on the ARNG-TR classification of the Training Center method IAW NGR 5-3, which uses measured operational capability for individual/collective live fire ranges, maneuver land, and transient training billeting capacity. The Training Center classification will be one of the following:

(1) **Close In Training Area (CITA)**. A site with no live fire capability, but supports requirements at the individual and/or small unit level at or near home station. No full-time support, range and support facilities, or cantonment facilities are authorized.

(2) **Local Training Area - LTA (Level VI)**. A local training site that supports requirements at the individual and/or small unit level at or near home station. No full-time support or cantonment facilities are authorized.

(3) **Local Training Center - LTC / Intermediate Training Center - ITC (Level V)**. A training site that supports individual and collective training up to company level. Full-time support and limited cantonment facilities are authorized.

(4) **Collective Training Center - CTC (Level IV)**. A training site/installation designed to support individual and collective training up to battalion level. Full-time support and cantonment facilities are authorized.

(5) **Maneuver Training Center-Light - MTC-L (Level III)**. A training site/installation designed to support individual and collective training for multiple battalions. Full-time support and cantonment facilities are authorized.

(6) **Maneuver Training Center-Heavy - MTC-H (Level II)**. A training site/installation designed to support individual and collective training for a brigade level. Full-time support and cantonment facilities are authorized.

(7) **Mobilization Force Generation Installation - MFGI / Enhanced MTC-H (Level I)**. A training site/installation designed to support individual and collective training for multiple brigades. Full-time support and cantonment facilities are authorized.

b. Space allowances.

(1) Training center facility space allowances are based on the classification of the center as verified and set by ARNG-TR (NGR 5-3). The classification drives the number and mix of facilities, which in and of themselves are of standard size. A project may consolidate some or all facilities into a single complex.

(2) Prior to submittal of the DD Forms 1390/91 for a training center project, States should contact ARNG-TR to verify the current classification of the training center, any requested ranges, and any requested deviations from the standard training center package. All such deviations must be processed as exceptions to criteria.

(3) Refer to Table 5-1 for the Type and Number of Unit Transient Training Cantonment Facilities.

(4) Use Table 5-2 to determine Unit Transient Training Cantonment Facility and Parking Allowances.

(5) Table 5-3 provides the space allowances for Training Center Billeting.

(6) See Table 5-4 for Troop Medical Clinic Allowances.

- (7) Refer to Table 5-5 for Physical Exam Allowances.
- (8) Refer to Table 5-6 for Chapel Allowances.
- (9) Refer to Table 5-7 for Range Facilities Allowances.
- (10) Refer to Table 5-8 for Training Center Headquarters Allowances.
- (11) Refer to Table 5-9 for Range Operations and Maintenance Allowances.
- (12) Refer to Table 5-10 for ID Processing Center Allowances.
- (13) Refer to Table 5-11 for Department of Public Works Allowances.
- (14) Refer to Table 5-12 for Police Station Allowances.
- (15) Refer to Table 5-13 for Fire Station Allowances.
- (16) Refer to Table 5-14 for Recycle Center Allowances.
- (17) Refer to Table 1-5 for Space allowances for Flagpoles
- (18) Refer to Table 1-7 for Facility Support Space allowances.
- (19) Refer to Table 1-8 for Circulation allowances.
- (20) Refer to Table 1-9 for Walls allowance.
- (21) Refer to Table 1-10 for Space allowances for Controlled Waste Handling Facilities (CWHF).
- (22) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify such requests and the NGB proponent must concur with them before ARNG-ILI will approve including them in the programming documents and the final design of the project.
- (23) For detailed design guidance, refer to NGB DG 415-4.

5-2. Non standard Supporting Items

In planning the functional arrangement of facilities, the State shall give appropriate consideration to the existing site conditions, layout, and materials of construction in order to achieve maximum operating efficiency, cost effectiveness, and flexibility. The following exterior items are authorized Federal reimbursement for training center projects:

a. Roads: The allowance for roads shall be as indicated on the approved State Real Property Development Plan (RPDP) and as specified below.

(1) Cantonment area. Main roads shall be 32 feet wide. Construction shall be flexible pavement unless rigid concrete is justified by an economic analysis. In addition, a 6 foot wide sidewalk is authorized for one side of each cantonment area road.

(2) Tank trails. Main tank trails shall be 30 feet wide, and secondary tank trails shall be 20 feet wide. Construction may be stabilized hardstand.

(3) Training Area Roads. Roads shall be 30 feet wide if tracked vehicles are authorized and 24 feet wide otherwise. Construction shall be improved gravel surface.

(4) Other roads. Flexible pavement or rigid concrete (if supported by an economic analysis) surface on other roads will be justified on an individual basis.

(5) NGB-ILI will determine the exact amount and type of pavement at the preliminary design review, based on an economical and practical site facility layout.

(6) If project is to be conducted as part of a Mater Planning phasing, the first project must contain the necessary roads for the follow on phases.

b. Vehicle wash platforms:

(1) The number of wash platforms authorized at a training center is in addition to those authorized for a MATES or UTES located on the training center but does not include any wash platforms at other DoD component facilities on the training center that are available for ARNG use.

(2) The size and design of wash facilities shall be IAW TM 5-814-9.

(3) Other environmental features required by Federal, State and local codes will be included. Central birdbath wash facilities must be justified on a case-by-case basis.

(4) An exterior wash rack may be enclosed by a heated shed-type structure when the heating design temperature, as designated in UFC 3-400-02, is minus (-) 10 degrees Fahrenheit or lower, or the annual snowfall exceeds 30 inches and the Training Center is operational during the months when the conditions prevail. If enclosed, the structure is to be annotated in Block 9 of the DD1391 as a separate primary facility line item.

5-3. Training Center Facilities

These facilities fall into three major categories: those facilities that are issued to training units, ranges and training areas used by training units, and facilities utilized primarily by the training center support staff to maintain the training center.

a. Facilities issued to training units (Tables 5-1 through 5-6):

(1) Authorizations will be based on the classification of the training center. Space allowances are authorized in accordance with the approved RPDP, which includes the training center's Site Development Plan (SDP). Facilities not listed on the plan may be authorized when individually justified as an exception to criteria. See Tables 5-1 through 5-6.

(2) Aviation facilities.

(i) Helipads (rigid concrete and unlighted according to UFC 3-260-01) are authorized at training sites that are used more than 30 days per year to support annual training for aviation units and/or flight training areas for aviation units.

(ii) Tie-down pad layout and dimensions of aircraft parking and maneuver area shall be according to UFC 3-260-01. Parking facilities shall be rigid concrete. Pads will be authorized when justified by usage for a minimum of 30 days per year or two annual training cycles. Unlighted reflective hover-lane markers and lighted wind socks are authorized in conjunction with the pads.

(iii) An aircraft maintenance area may be provided in conjunction with the tie-down pads. It shall be rigid paving, 75 feet by 75 feet or sized to accommodate CH-47 aircraft.

(iv) Hardstand for vehicular access to the maintenance area and for maneuvering of refueling and service vehicles may be provided in conjunction with the tie-down pads/maintenance area. A 15 foot by 45 foot covered curbed rigid concrete pad is authorized for parking of each refueling vehicle.

(v) A grounding connection should be provided at each refueling pad.

(vi) Construction of new fixed wing, hard surfaced runways and associated facilities will be handled as exceptions to criteria. Sustainment, Restoration and Modernization (SRM) of existing facilities is authorized.

b. Ranges and training areas used by training units (Table 5-7).

Ranges are authorized at training centers when validated with a Range Complex Master Plan (RCMP) and approved by ARNG-TR. In addition ARNG-AV must validate the surface danger zone (SDZ). Range development projects require careful, deliberate planning by a team of trainers, engineers, safety specialists, environmental specialists, and resource managers. Ranges are authorized at training centers to support the annual weapons qualification/familiarization requirements for the Army (AR) and Army National Guard (ARNG) units habitually using the training center in accordance with DA Pam 350-38. Requirements must be documented in the State Range Development Plan.

(1) For each established aerial gunnery range, four firing/harmonization points are authorized. They shall be constructed of rigid paving, 40 feet by 40 feet – Ref. Training Circular No. 25-8 (TC 25-8).

(2) For each established aerial gunnery range rearming/refueling points are authorized as required. They shall be rigid paving, 75 feet by 75 feet, Ref. TC 25-8, Hot refueling and approved by ARNG-AV. A hardstand service road may be provided for access by ammunition and fuel trucks.

(3) The supporting facilities at a range shall be based on the type and size of range authorized, and the space allowance will normally be limited to those in Table 5-7. The requirements of TC 25-8 shall take precedence over authorizations in this table. Table 5-7 authorizations are for gross area, including walls and circulation.

(4) Authorizations are for standard small arms ranges. Ranges that have lower usage rates should have the number of firing lanes and support facilities scaled down or eliminated so that only those facilities necessary to render a complete and usable range are included in the project.

c. Facilities utilized by the training center support staff to maintain the training center (Tables 5-8 through 5-14).

In addition to those facilities identified in Table 5-8 through Table 5-14, training centers are authorized the following spaces:

(1) Mail Room. A 600 sq ft mailroom is authorized to conduct mail room operations at training centers. Location and construction shall take force protection requirements into consideration.

(2) Access Control Facilities. A training center is authorized facilities housing operations for the regulation of access and/or egress to designated areas or facilities as in compliance with UFC 4-022-01. Primary uses of these facilities are to provide entrance control, guard posts, and watchtowers. Such facilities offer observation and control of incoming and outgoing traffic, protection of security personnel from the elements, and an area to conduct personnel identification and visitor control.

(3) Land Mobile Radio System Tower: The quantity of land mobile system towers is based on the training center mission, size (acreage/square miles), number of ranges, and number of mobile radios in operation. Users include range operations, facilities, equipment, and vehicle maintenance, fire and emergency services, medical response, and air and ground evacuation.

(4) Soldier Readiness Processing (SRP) Facilities. As authorized by ARNG-TR, those training centers designated as a Level I or those training centers with a requirement to deploy units to the mobilization station once SRP is completed are authorized an SRP facility. Primary tasks supported by this facility (or facilities) are administrative (records review, legal document preparation, finance review) and medical (vaccinations, dental, physical exams).

Ideally, all SRP facilities should be co-located to facilitate command and control of the units being supported. Waiting areas should be designated to support company sized units and to conduct required briefings and group instructions. There are normally two waiting areas required, one for units beginning in-processing and one used as a holding area for processing Soldiers.

(5) Training Aids Support Center (TASC)/ Multiple Integrated Laser Engagement System (MILES) Warehouse). Authorizations are for TASC items issued to the training center to support the units that habitually train there. To determine the authorized size, multiply the required storage space times 2 (for intrafunctional circulation) and add 130 square feet per assigned employee and 200 square feet for a device testing and repair center. TASC equipment has specific limitations on how many storage containers can be stacked on one another. To calculate the storage space for each separate type of item multiply the numbers of containers times the size in square feet of the container and then divide by the authorized number of containers in a stack.

(6) Museums. Museums are authorized if they are recognized by the Center for Military History. Museums are authorized Federal support for construction, sustainment, restoration, modernization, and facilities operating costs if they are specifically recognized and approved in writing by Office of the National Guard Historian (NGB-PAH) and approved for DOD support by ARNG-ILI-E.

(7) Ammunition Supply Point (ASP). An ASP is authorized at training sites, when justified and approved by the Department of Defense Explosive Safety Board (DDESB).

(i) Ammunition related projects and projects within the quantity distance arc (QDA) of ASP facilities will not receive approval to go beyond conceptual design until the State receives DDESB approval of the preliminary site plan. Such plans must comply with AR 385-10, DA Pam 385-64, U.S. Army Technical Center for Explosives Safety (USATCESP) Publication 385-02, and other appropriate publications.

(ii) Storage shall be according to AR 385-10, DA Pam 385-64, and other appropriate DA and DoD publications. US Army Corps of Engineers (USACE) standard drawings should be used as the standard design for earth covered steel arch magazines. A limited or small quantity of ammunition may be stored in above ground structures or reinforced above ground magazines (RMAG), if approved by DDESB.

(iii) In addition to meeting all safety and structural requirements, ammunition storage projects shall include fencing, security lighting and intrusion detection systems as required by AR 190-11 and approved by ARNG-ILI

(iv) A covered loading dock fitted with a dock leveler is authorized.

(v) ASP administrative offices, where no ammunition operations are conducted, should be located at Inhabited Building Distance (IBD) from ammunition storage or operations.

(vi) A surveillance/operation building is authorized at all ASPs.

(vii) A residue building is authorized at all ASPs.

(viii) A vehicle marshalling/inspection area large enough to hold all the ammunition vehicles of the ASP's largest customer is authorized near the entrance of the ASP.

(8) TISA. A TISA is authorized only at locations where commercial supplies are not available within a reasonable distance. Prior to submitting DD Forms 1390/1391 programming documentation for the establishment and construction of a TISA, States shall contact ARNG-ILS to determine if a facility is authorized and to obtain guidance on justification and space allowances. Any requested TISA shall be considered an exception to criteria.

(9) Storage facilities. Warehouses, hazardous materials (HAZMAT) storage, enclosed vehicle storage, enclosed equipment storage, etc., are authorized, when appropriate and justified, to store and manage the materials, supplies and equipment required by the training center to support the units/personnel utilizing the training center. Space allowances are calculated based on cubic feet, stack height, personnel authorized, and intra-functional circulation required. Allowances vary between training centers based upon the mission and may include but are not limited to storage for:

- (i) Linens
- (ii) Billeting furniture
- (iii) Office furniture
- (iv) Kitchen equipment
- (v) Mission specific supplies/equipment
- (vi) Morale, Welfare, and Recreation (MWR) supplies
- (vii) Medical supplies
- (viii) Miscellaneous Class II supplies
- (ix) Prepositioned unit equipment
- (x) Training Unit Class IV/V (replicated) storage

(10) Environmental Facilities. The facilities in this area vary from training center to training center. These facilities are authorized based upon the support mission of this section, the number of required employees (Active

Guard/Reserves (AGRs), military technicians, federally reimbursed State employees, and contractors), and the amount and type of equipment required.

(11) Parade Field. Training centers are authorized an area that provides open space for military ceremonies, outdoor training, and conduct of physical exercise. The parade field should include permanent or portable bleachers, a 600 square foot covered reviewing stand and, electricity to power a portable public address system.

(12) Running track/multipurpose athletic field. Training centers are authorized a facility to conform to the standards established in FM 7-22. The track and athletic field is only authorized for individual preparation for and conduct of the Army Physical Fitness Test (APFT).

(13) Potable water point(s). Potable water points shall be strategically located in order to fully support training units.

(14) Training Center Communications. Facilities to support the telecommunications hub(s) are authorized as required to support the training center in coordination with the State's J-6.

5-4. Local Training Areas General

Facilities may be of a type consistent with training in a field environment.

a. Field kitchens. Construction of field kitchens shall consist of a concrete floor and lightweight wood or metal roof structure, with 4 foot high siding and screens above. Wood shutters may be provided to cover the screens.

b. Mess shelter. Construction of mess shelters shall consist of a concrete floor and lightweight wood or metal roof structure. Screening or siding may be authorized if justified.

c. Latrines. Latrines shall consist of a concrete floor, lightweight wood or metal roof structure and wood, metal, or concrete block walls. Ventilation openings shall be screened and shuttered. No windows are authorized. Unless an existing sanitary system is available at the site, concrete holding tanks/pits shall be provided in accordance with applicable Federal, State, and local environmental laws and regulations.

d. Vehicle wash platform.

A wash platform may be authorized, if justified.

e. Others.

All other facility requirements not specifically indicated shall require approval of an exception to criteria.

Table 5-1. Type and Number of Unit Transient Training Cantonment Facilities

Facility <u>1/</u>	Level V	Level IV	Level III	Level II	Level I
1 Billets <u>2/</u>	640 spaces	1,040 spaces	2,280 spaces	4,560 spaces	9,120 spaces
2 Dining Facility	200 person, <u>3/</u>	200 person, <u>3/</u> (1) 400	<u>3/</u>	<u>3/</u>	<u>3/</u>
3 Bde. Headquarters TT	NA	NA	1	2	3
5 Bde Support Fac.	NA	NA	0	1	2
6 Bn Headquarters TT	NA	1	3	6	12
7 Co. Supply/Admin	3	6, <u>4/</u>	12, <u>4/</u>	24, <u>4/</u>	48, <u>4/</u>
8 Physical Fitness Area	<u>1/</u> <u>5/</u>	<u>1/</u> <u>5/</u>	<u>1/</u> <u>5/</u>	<u>1/5/</u>	<u>1/5/</u>
9 Bn Sup/Rat Breakdown	NA	1	3	6	12
10 Cleaning/Maint Bldg <u>6/</u>	2,700 sq. ft.	5,400 sq. ft.	16,200 sq. ft.	32,400 sq. ft.	32,400 sq. ft.
11 Battalion Maint Shelter	NA	1	3	6	12
12 Troop Medical Clinic	NA	1	1	1	1
13 Physical Exam Center	<u>1,7/</u>	<u>1,7/</u>	<u>1,7/</u>	<u>1,7/</u>	<u>1,7/</u>
14 Training Device/ Simulation Center	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>	<u>8/</u>
15 Distance Learning	<u>9/</u>	<u>9/</u>	<u>9/</u>	<u>9/</u>	<u>9/</u>

16	General Instruction	1,500, <u>10/</u>	1,500, <u>10/</u>	2,400, <u>10/</u>	2,700, <u>10/</u>	3,000, <u>10/</u> Buildings Base
17	Chapel	1, <u>11/</u>	1, <u>11/</u>	1, <u>11/</u>	1, <u>11/</u>	1, <u>11/</u>

Notes:

1/ Authorizations will be based on the classification of the training center.

2/ The numbers depicted are maximum authorizations.

3/ Dining hall allowances equal authorized billeting spaces. Up to one-half of the allowance may be 200 persons sized dining facilities; the remainder should be served by 400 or 800 persons sized dining facilities.

4/ Plus one building per battalion for a support element headquarters. For unheated storage, detached buildings may be used, or an equivalent area may be incorporated within the facility.

5/ TI 800-01, Appendix H. The space criteria for physical fitness centers are shown in the table below. Generally these facilities include gear issue control, gymnasium, locker rooms, offices, exercise room(s), spectator area, storage, and toilet facilities. This type of facility is intended to be capable of supporting basic physical fitness skill training requirements. New physical fitness facilities shall be designed in accordance with technical criteria for U.S. Army Physical Fitness Facilities.

Space Criteria for Physical Fitness Facilities		
Military Population	Area (sf)	Area (square meters)
251 to 1,000	27,771	2580
1,001 to 3,000	44,347	4120

Military population is defined as all personnel (AGR, technician and Federally reimbursed State employees) assigned to the training center, plus 10% of total billets space. At training centers where the population is less than or equal to 250, refer to Table 5-2 to obtain the space authorization for a Physical Fitness Facility.

6/ This allowance is for buildings in which units clean and maintain small arms weapons and basic initial issue equipment. For each Level I-III, there shall normally be one per authorized battalion headquarters. For the Level V, there shall normally be one per authorized company supply/admin building. For the Level IV, the State may choose between one consolidated building or one per authorized company supply/admin building.

7/ Space is authorized if validated and approved by ARNG-CSG. See Table 5-5 for space allowances. Total patients supported across the entire state training centers cannot exceed the total state strength.

8/ Training centers are authorized any facility listed in DA Pam 415-28 with a facility category code beginning with 172 and 179 so long as these facilities are required by habitual users of the training center and are approved by ARNG-TR

9/ Space is authorized if validated and approved by ARNG-ILS-L. This space is in addition to any classroom space otherwise authorized.

10/ Classroom space is authorized using the formula of 10 square feet per person based on the capacities of authorized billeting spaces, plus the basic space from the table. An auditorium with inclined floor and installed seats is authorized for training centers Level IV and higher. Auditorium space is subtracted from the authorized classroom space.

11/ For chapel space allowances, see Table 5-6.

Table 5-2. Unit Transient Training Cantonment Facility and Parking Allowances

Standard Facility <u>1/</u>	Net Square Feet	Admin. Vehicles Parking (sq yd)
1. Brigade Headquarters TT	7,120	600
2. Battalion Headquarters TT	5,196	400
3. Battalion Supply/Ration Breakdown	2,409	400
4. Company Supply and Administration TT	2,980	200
5. Dining Facilities		
a. 200 Person	4,500	200
b. 400 Person	8,400	300
c. 800 Person	14,800	400
6. Troop Medical Clinic	<u>2/</u>	500
7. Battalion Maintenance Shelter <u>3/</u>	7,204	
8. Physical Fitness Area <u>4/</u>	2,050	400
9. Motor Pool (per battalion/sep company size element) <u>5/</u>		8,000
10. Ranges		
a. Admin/Basic		150
b. Wheeled Vehicles		# firing lanes x 50 divided by 2
c. Tracked Vehicles		Estimated number of tracked vehicles to be on range times 75
11. Bde Support Facility		
a. Heated Storage	2,690	400
b. Covered Storage	10,000	
c. Open Storage (Fenced)	6,000 Sq Yds	

Notes:

1/ Allowance is per facility/area as authorized in Table 5-1

2/ The Troop Medical Clinic shall provide a scope of care directed by Health Services Command to eligible military personnel. Sizing shall be based on Table 5-4.

3/ The shelter should be an open-shed type enclosed on three sides with 6-inch rigid concrete floor and up to 400 square feet may be enclosed for an office and latrine. The shelter may be enclosed on four sides and heated if located geographically where the outside design temperature is 15 degrees Fahrenheit dry bulb or less designated in UFC 3-400-02 or the annual snowfall exceeds 30-inches as designated in UFC 3-400-02; and where the shelter is required to be used for winter annual training/Inactive Duty Training (IDT). Maintenance bays for oversized vehicles will be addressed as exceptions to criteria.

4/ An additional 22 square feet per TDA full time position is authorized for shower/locker/latrine space; 450 square feet of the basic allowance is also for this purpose. This portion of the allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage. If there are readiness centers, educational facilities, logistics facilities, and aviation facilities located on the training center, they are not authorized a separate physical fitness area. Instead, the TDA full-time authorizations for all activities on the training center should be combined and multiplied by 22 to get the additional allowance for shower/locker/latrine space.

5/ Where more than one motor pool is to be constructed, they should be contiguous to accommodate varying sizes of battalions/separate companies. This area may be fenced.

Table 5-3. Training Center Billeting Allowances 1/

Pay Grade	Open Bay <u>2/</u>	1 + 1 <u>3/</u>	Private <u>4/</u>
E4 and below	90 SF/person	90 SF/person	NA
E5 and E6	90 SF/person	135 SF/person	NA
E7 through E9	NA	250 SF/person	250 SF
W01, CW2, 01, 02	NA	NA	250 SF
CW3-CW5, O3-O6	NA	NA	250 SF
General Officer	NA	NA	430 SF
Lounge/ Vending	12 SF/person	12 SF/person	12 SF/person
Laundry	144 SF/20 billeting spaces	144 SF/20 billeting paces	144 SF/20 billeting

Notes:

1/ Allowances are in net square feet, exclusive of interior and exterior walls and of a 20 square foot closet in each 1+1 and private room. States must justify the split among the three configurations of rooms and the number/location of separate buildings. HVAC is authorized.

2/ No more than 20 persons per room with an additional allowance of 10 square feet per person for a latrine (including showers).

3/ One individual per room sharing bath/service area of 100 square feet (not included in the allowance shown above).

4/ One individual per room with a private bath/service area of 100 square feet (not included in the allowance shown above).

Table 5-4. Troop Medical Clinic Allowances 1/

Functional Area	SF	Notes
1. Clinic Entrance	50	Plus 50 SF covered entrance
2. Entrance Lobby	200	
3. Public Toilet	380	
4. Information Desk	60	
5. Radiology	360	
6. Clinic Pharmacy	240	
7. Advise Nurse Area	100	Plus 60 SF/nurse
8. Appointment Clerk	130	
9. Central waiting		3 seats/provider, 16 SF/seat, except that 5% of seats are 25 SF for handicapped/litter patients
10. Reception control	140	
11. Screening, weights, & measures		80 SF each, 1 room per 4 providers or fraction thereof
12. Provider exam rooms		120 SF each, 2 exams rooms/provider
13. Isolation exam	140	
14. Dedicated isolation toilet	60	
15. Patient toilets	220	
16. Administrative Office	400	Plus 130 SF/admin person assigned
17. Provider's office		130 SF each
18. Nurse manager	130	1 per 10 nurses
19. Nurse's workroom	130	Plus 40 SF per nurse above 4
20. NCOIC/LCPO/LPO Office	130	One per provider team
21. Clean utility room	120	less than or = 15 exam rooms
	150	16 to 30 exam rooms
	160	>30 exam rooms
22. Soiled utility room	90	less than or = 15 exam rooms
	120	16 to 30 exam rooms
	150	>30 exam rooms
23. Scope wash room	120	
24. Equipment storage	100	
25. Team conference room	250	Per provider team of 6-8 persons
26. Litter/wheelchair storage	60	
27. Staff lounge	140	
28. Staff lockers	282	
29. Staff toilets	380	
30. Janitorial closet	60	
31. Treatment room - GP	175	1 per 6 providers

32. Holding room	175	
33. Treatment room, 2 station	340	
34. Immunization Waiting Area		16 SF per space. 12 spaces per injection station
35. Immunization Room	215	One per primary care clinic; one station. Multiple stations may be authorized for more than 12
36. Immunization Holding area	100	One per immunization room
37. Orthopedic Appliance Mod, Prep, & Cast Room	140	
38. Laboratory (Mini Lab)	60	

Note: 1/ Based on DoD Space Planning Criteria for Health Facilities

Table 5-5. Physical Exam Allowances 1/

Functional Areas	Allowances		
	Exams per Year		
	161-320	321-640	641-1280 <u>2/</u>
1. Reception, Waiting and Form Writing	210 SF	280 SF	350 SF
2. Doctor's Office (80 sf each)	80 SF	80 SF	160 SF
3. Exam Room (110 sf each) <u>3/</u>	220 SF	330 SF	550 SF
4. History Station	70 SF	70 SF	105 SF
5. Height & Weight Station	70 SF	70 SF	70 SF
6. Blood Pressure and Pulse Station	70 SF	70 SF	70 SF
7. Electronic Consult System (ECS) and Tonometry Station	in exam room	110 SF	110 SF
8. Lab	70 SF	70 SF	70 SF
9. Blood Specimen Collection	70 SF	70 SF	70 SF
10. Specimen Toilet	36 SF	36 SF	60 SF
11. Vision Test	70 SF <u>4/</u>	70 SF <u>4/</u>	70 SF <u>4/</u>
12. Hearing Test	90 SF	150 SF	210 SF
13. Dental Check (100 sf ea)	100 SF	100 SF	200 SF
14. Circulation	345 SF <u>4/</u>	485 SF <u>4/</u>	675 SF <u>4/</u>

Notes:

1/ Authorized where physical examinations are conducted at the training center. On those training centers that are required both a Troop Medical Clinic (TMC) and Physical Exam Station, these facilities should be co-located to take advantage of like-type equipment and space.

2/ For over 1280 exams/year, use the space data for 641-1280 and increase the number of days per year that the facility is operated.

3/ One room may be used for consulting, review of completed physical examination paperwork, weight control counseling or similar purposes.

4/ An additional 140 square feet is authorized to accommodate eye examinations if the facility is authorized to conduct flight physical examinations. The circulation space should then be increased by 20 square feet because of the additional 140 square feet for the eye examinations.

Table 5-6. Chapel Allowances

1. Chapel	10.5 sq. ft/seat (minimum 335 sq. ft) <u>1/</u>
2. Altar	100 sq. ft
3. Storage	100 sq. ft
4. Chancel	100 sq. ft
5. Chaplain's Office	140 sq. ft plus 120 sq. ft for each additional chaplain
6. Chaplain Assistant and Waiting	120 sq. ft
7. NCOIC	120 sq. ft
8. Chaplain Trainee	100 sq. ft plus 60 sq. ft for each additional trainee
9. Counseling Room	140 sq. ft (1 per every 3 Chaplains – minimum 1)
10. Rest Rooms	3 sq. ft/seat

Note:

1/ Determined by the State Chaplain, based on the habitual training unit historical worship service requirements. (Reference Army Standard Design Requirements for the Small Compact Chapel Facility Type)

Table 5-7. Range Facilities Allowances

For Table 5-7, reference TC 25-8, Appendix D, which lists authorized range operation support facilities associated to each range.

Table 5-8a. Training Center Headquarters Allowances

Functional Areas <u>2/</u>	55-99	100-175	176-up
1 Assembly Hall	5,400	5,400	5,400
2 Classrooms <u>3/</u>	800	1,000	1,500
3 Learning Center <u>4/</u>	500	500	500
4 Multipurpose Training Area <u>5/</u>	1,500	1,500	1,500
5 Kitchen <u>6/</u>	0	0	0
6 Break/ Vending	<u>7/</u>	<u>7/</u>	<u>7/</u>
7 Toilets/Shower <u>8/</u>	1,220	1,300	1,400
8 Flam Mats. Storage	100	100	200
9 Lactation Area/Room	80	80	80
10 Family Readiness Office	250	250	250
11 RAPIDS Office <u>9/</u>	150	150	150
12 Retention Office <u>10/</u>	110	110	110
13 Table/Chair Storage	300	300	300
14 Physical Fitness <u>11/</u>	0	0	0
15 Controlled Waste Handling Facility (CWHF)	<u>12/</u>	<u>12/</u>	<u>12/</u>

Notes:

1/ Training Center Headquarters can be combined with the National Guard Readiness Center function.

2/ All functional areas listed in Table 5-8a are for the common use for the training center TDA.

3/ Refer to Table 2-1. Note 3

4/ Refer to Table 2-1. Note 4

5/ Refer to Table 2-1. Note 5

6/ Training center headquarters are not authorized a kitchen, since the unit has use of the training center assets.

7/ Refer to Table 2-1. Note 7

8/ Refer to Table 2-1. Note 8

9/ Only one RAPIDS office is authorized per campus/training site.

10/ Retention office SF is based on a AR 405-70 category P5 at 110 SQFT is authorized at one per facility, plus an additional 110 SQFT office per unit over 55.

11/ Physical Fitness area is not authorized if a campus/training site physical fitness facility exists..

12/ See Table 1-9 - CWHF.

**Table 5-8b. Schedule II, Unit and Special Space Allowances 1/
(Allowance in net square feet, exclusive of interior and exterior walls)**

1. Administrative Office Space: 2/

Functional Area	Allowance
a. Basic Allowance	
(3) Unit with strength of 75 and less	400
(4) Unit with strength over 75	800
b. Office Allowance <u>3/</u>	
c. Special Administrative Allowances: <u>4/</u>	
(6) Battalion Headquarters and Headquarters Company (HHC or HHD)	1,500

2. Unit Storage Space (minus Arms Vault) 8.1.a/

Functional Area	Allowance
a. Arms Vaults	<u>5.1.b/</u>

3. Locker Room Space 6/

Functional Area	Allowance
a. Basic Space (one per readiness center)	200
b. Space per each individual authorized in the readiness center	18

Notes:

1/ Refer to Table 2-2. Note 1

2/ Refer to Table 2-2. Note 2

3/ Refer to Table 2-2. Note 3

4/ Refer to Table 2-2. Note 4

5/ Unit storage space shall be computed based on authorized strength of, and cubage of the equipment (excluding vehicles/equipment provided space under military equipment parking, other items normally stored outside and provided space elsewhere, and individual clothing and equipment) authorized to the unit(s) assigned to the facility.

a. Each unit or detachment with a required strength of 55 or more is authorized:

(1a) Heated storage space. A net area of 2,700 square feet within the readiness center facility is authorized for an equipment cubage of 0 to 4,000 cubic feet.

(1b) Arms Vaults. One vault (600 square feet) for every unit greater than 12.

(2) Unheated storage space. If total equipment cubage exceeds 4,000 cubic feet, a detached building or an equivalent area incorporated within the readiness center facility is authorized based on one of the following applicable categories:

Total Cubage In Cubic Feet	Net Square Feet (NSF) Authorized
4,001 to 8,000 NSF	= 0.6 x (Total Cubage minus 4,000)
Exceeds 8,000 NSF	= 2,400 + [0.2 x (Total Cubage minus 8,000)]

b. Each unit or detachment with a required strength of less than 55 but greater than 10 is authorized:

(1) Heated storage space. A net area (minimum of 1,300 square feet) within the readiness center facility for an equipment cubage of 0 to 4,000 cubic feet as determined by the formula listed below.

$$\text{Heated Storage} = 0.6 \times \text{Total Cubage}$$

(2) Unheated storage space. If total cubage exceeds 4,000 cubic feet, use the appropriate applicable category referenced above in Note 5a (2).

6/ Space may be divided, provided that the total of the separate space allocated to men and women is within the total space authorized. Also, a part or the total area may be used as unit storage space.

Table 5-9. Range Operations and Maintenance Allowances

Functional Area	SF	Notes
a. Admin Space	130	Per authorized position
b. Break Room/Area		<u>1/</u>
c. Toilet and Shower	250	Plus 10 SF per auth position
d. Locker Room	125	Plus 12 SF per auth position
1. Range Administration		
a. Reception Area	175	
b. Conference/Classroom		As required
c. Record Storage	150	
2. Range Operations		
a. Map Storage/Library	400	
b. Radio Room	250	
c. Scheduling Area	200	
d. Safety Briefing Room		As required
3. Target Systems		
a. Electrical Shop/Bay		As required
b. Storage Room (electrical)		As required
c. Battery Room		As required
4. Supply/Support		
a. Carpenter/Target Maintenance Shop		As required
b. Untreated Lumber Storage (Unheated)		As required
c. Tool Room Storage		As required
d. Target Storage (unheated)		As required
e. Treated Lumber Storage (unheated)		As required
f. Ground Maintenance Equipment Storage (unheated)		As required
g. Paint Storage		As required
h. Fire Truck Ready Bay/Water Tanker	1024	Per assigned vehicle

Notes:

1/ Basic authorizations are 200 square feet for up to 4 full-time support personnel. It is 400 square feet for staffing levels between 5 and 8 full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel, 12 square feet per individual for 21 to 40 full-time support personnel, and 8 square feet per individual for full-time support personnel exceeding 40.

Table 5-10. ID Processing Center Allowances

1. Work station allowance	130 sf / workstation
2. File storage	50 square feet / workstation
3. Personnel holding space/photo processing	65 square feet / workstation
4. User specific display area	30 square feet / workstation
5. Waiting room/Reception Area	150 square feet / workstation
6. Break Room/Area	<u>1/</u>
7. Toilet and Shower	250 square feet plus 10 square feet per auth position
8. Locker Room	125 square feet plus 12 square feet per auth position

Note:

1/ Basic authorizations are 200 square feet for up to 4 full-time support personnel. It is 400 square feet for staffing levels between 5 and 8 full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel, 12 square feet per individual for 21 to 40 full-time support personnel, and 8 square feet per individual for full-time support personnel exceeding 40.

Table 5-11. Department of Public Works Allowances 1/

1. Administration

a. Conference/Classroom	500 SF + 10 SF per person based on authorized strength
b. Record / Archive Storage	
c. Drafting Office	130 SF/ auth pos plus automation
d. Drafting Table	100 SF/ table
e. Geographic Information Systems (GIS) Operator	130 SF/ auth pos plus automation
f. Learning/Library Center	250 SF
g. Drafting Supply Storage Area	100 SF
h. Surveying Equipment Storage Area	
i. Break Room/Area	<u>2/</u>
j. Toilet and Shower	250 square feet plus 10 square feet per auth position
k. Locker Room	125 square feet plus 12 square feet per auth position

2. Facilities Maintenance Section 1/

a. Carpenter's Shop	
b. Electrical Shop	
c. Plumbing Shop	
d. Machine Shop	
e. HVAC Shop	
f. Glass Repair Shop	
g. Locksmith Shop	
h. Sign Shop	
i. Paint Shop w/heated storage	
j. Telecom Shop	
k. Tool Room	
l. Tool Issue Office	
m. Supply Warehouse	
n. Supply Yard	

3. Roads and Grounds Shop 1/

a. Grounds Maintenance Shop	
b. Operator Repair Work bay (32x64)	
c. Tool Room	
d. Welding Shop	
e. Ground Maintenance Equipment Storage	
f. Equipment Storage Compound	
g. Loading Ramp	

Notes:

1/ The facilities in this area vary at each separate training center. These facilities are authorized based upon the support mission of this section, the number of required employees (AGRs, military technicians, and Federally reimbursed State employees), and the amount and type of equipment required. The information in this table should be used as a planning tool for areas to consider while designing this facility.

2/ Basic authorizations are 200 square feet for up to 4 full-time support personnel. It is 400 square feet for staffing levels between 5 and 8 full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel, 12 square feet per individual for 21 to 40 full-time support personnel, and 8 square feet per individual for full-time support personnel exceeding 40.

Table 5-12. Police Station Allowances 1/

1. Holding Cell, 2 each @ 72sf	144 SF
2. Arms Vault	300 SF
3. Dispatch Office	130 SF/person
4. Evidence Room	150 SF
5. Training Aid Storage	50 SF
6. Parking	POV 35 sy/ea Organizational 50 sy/ea Visitor 300 sy
7. Break Room/Area	2/
8. Toilet and Shower	250 square feet plus 10 square feet per auth position
9. Locker Room	125 square feet plus 12 square feet per auth position

Notes:

1/ A building that houses the operations of a provost marshal and the services and operations of the military police. The provost marshal is responsible for physical security, traffic, supervision of gate personnel, and law enforcement on the training center.

2/ Basic authorizations are 200 square feet for up to 4 full-time support personnel It is 400 square feet for staffing levels between 5 and 8 full-time support personnel, with an additional 20 square feet per individual for 9 to 20 full-time support personnel, 12 square feet per individual for 21 to 40 full-time support personnel, and 8 square feet per individual for full-time support personnel exceeding 40.

Table 5-13. Fire Station Allowances 1/

1. Administration/Training Area	1777 SF
2. Apparatus/Equipment Area	2197 SF
3. Billeting	675 SF
4. Latrines/Shower/Locker Rooms/Laundry/etc.	375 SF plus 22 SF per employee
5. POV/Civ Parking	35sy ea
6. TOE/TDA Equip Parking	50sy ea/75sy for ea over 30' long
7. Helipads	Sized IAW MEDEVAC Requirements

Note:

1/ Authorizations are per engine company. A fire station is a building that houses firefighting vehicles and equipment as well as the operating personnel of fire-fighting companies. Also included are facilities housing fire and emergency rescue equipment and personnel at any heliport or airfield on the training center. Space for drying hoses is included. Also report this facility with unit of measure vehicles (VE). Data should be available from the training center fire chief. If not, conduct a physical count of stalls and survey building area. Each firefighting/rescue vehicle stall provided at the facility counts as one VE. (Ref: UFC 4-730-10, Fire Stations).

Table 5-14. Recycle Center Allowances 1/

1. Office/Admin Space	130 SF/employee
2. Break Area	120 SF
3. Latrines/Shower	400 SF
4. Horizontal Bailer Area	1800 SF plus 800 SF for each additional bailer
5. Paper Shredding Area	1000 SF
6. Brass Deformer/Shredder Area	800 SF
7. Conveyor Area	1600 SF
8. Glass Processing Area	800 SF per color of glass
9. Storage Area	As Required
10. Receiving Area	1600 SF
11. Sorting Area	1200 SF
12. Shipping Area	1600 SF
13. Intra-functional	2000 SF

14. Battery Charging Area	400 SF for each piece of electric material handling equipment
15. Trash Transfer Point	1000 SF per outside container
16. Scrap Metal Storage Area	1000 SF per outside container
17. Pallet Processing Area	1800 SF
18. Truck Scales Area	2800 SF

Note:

1/ The facilities in this area vary from training center to training center. These facilities are authorized based upon the volume of recyclable materials, the number of required employees (AGRs, military technicians, and Federally reimbursed State employees), and the amount and type of equipment. The information in this table should be used as a planning tool for areas to consider while designing this facility.

Chapter 6 Educational Facilities

6-1. General

- a. Standards. This chapter establishes the space allowances for ARNG educational facilities (and educational support facilities) that are part of the Army School System (TASS).
- b. Space allowances.
 - (1) TASS facility space allowances are based on the Army Training Requirements and Resources System (ATRRS) student load as verified and set by ARNG-TR, the authorized strength(s) of the staff as documented on the TDA, and other manning documents showing full-time personnel, the numbers and types of equipment authorized, and special requirements of the supported units.
 - (2) Prior to submittal of DD Forms 1390/91 for an educational facility, States should contact ARNG-TR to determine if an educational facility is authorized and to obtain sizing guidance for space allowances.
 - (3) Refer to Table 6-1 for Space allowances based on student load.
 - (4) Refer to Table 6-2 for Space allowance for educational facility billeting.
 - (5) Refer to Table 1-5 for Flagpoles allowances
 - (6) Refer to Table 1-7 for Facility Support Space allowances.
 - (7) Refer to Table 1-8 for Circulation allowances.
 - (8) Refer to Table 1-9 for Walls allowance.
 - (9) Refer to Table 1-10 for Space allowances for Controlled Waste Handling Facilities (CWHF)
 - (10) All other space requirements not specifically indicated in the referenced tables will be treated as exceptions to criteria. The State must fully justify such requests and the NGB proponent must concur with them before ARNG-ILI will approve including them in the programming documents and the final design of the project.
 - (11) If there are any conflicts between the criteria in this pamphlet and those of Training and Doctrine Command (TRADOC) for an educational facility teaching the same Program of Instruction (POI), the TRADOC criteria shall take precedence. However, the State must include documentation of the TRADOC requirement(s) criteria as part of its request for exception to criteria.
 - (12) For detailed design guidance, refer to NGB DG 415-4.

6-2. Non standard Supporting Items

Parking pad for MCOFT and similar simulators. Federal support is authorized for a 60 foot square rigid concrete parking pad, with electrical power and telephone service, at each ARNG-TR approved site authorized to have an MCOFT or similar simulation device.

6-3. Joint Use

Inclusion of other educational and training functions within the GIB facility can greatly increase Army efficiencies through the use of shared resources. ACES generally operate after hours, allowing dual use of classrooms and support facilities. Inclusion of Applied Instruction that is directly related to the GIB aids communication and logistic operations by having students and staff perform both types of training concurrently. NCO training can share many of the same support functions with GIB. A GIB/ACES facility will include a combination of the classroom subtypes depending on the type of general instruction required.

Table 6-1. Educational Facility Allowances 1/

1 Administration

a. Instructor Offices (FTE)	130 SF
b. Instructor Offices (MDAY)	As per AR 405-70 tables D-1 and D-2
c. Information/ Reception	10 SF per visitor IAW AR 405-70 for Commanders, heads of directorates, offices, bureaus, agencies, and comparable positions in Grades O7-O10, SES, are authorized reception areas of visitors in a single meeting.
d. Conference/ Counseling Rooms	1 Conf room per 15 FTE <u>12/</u>
e. Work/ Copy Space	3 SF/ FTE, but not less than 100 SF
f. Student Records Storage	3 SF/ FTE
g. Staff Break Area	4 SF/FTE, but not less than 120 SF

2 Support Facilities

a. Office Supply	4 SF/ FTE																																			
b. Central Storage	4 SF per peak habitual student load																																			
c. Unit Storage	<u>2/</u>																																			
d. Computer Maintenance <u>14/</u>	3 SF per peak habitual student load																																			
e. Network Ops Center/ Digital Training repository <u>15/</u>	1 SF per peak habitual student load																																			
	Student Peak Training Load																																			
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 12.5%;">Basic Allowance</th> <th style="width: 12.5%;">Below 100</th> <th style="width: 12.5%;">Basic Allowance</th> <th style="width: 12.5%;">Below 100</th> </tr> </thead> <tbody> <tr> <td>f. Medical/Aid Station</td> <td>NA</td> <td>400</td> <td>400</td> <td>400</td> </tr> <tr> <td>g. Publication Storage</td> <td>5 SF/student</td> <td>500</td> <td>500</td> <td>500</td> </tr> <tr> <td>h. Mail Center</td> <td>NA</td> <td>400</td> <td>500</td> <td>600</td> </tr> <tr> <td>i. Showers/Lockers <u>3/</u></td> <td>22 SF/TDA position</td> <td>300</td> <td>300</td> <td>300</td> </tr> <tr> <td>j. Toilets <u>18/</u></td> <td>3 SF/student</td> <td>300</td> <td>400</td> <td>500</td> </tr> <tr> <td>k. Physical Fitness Area <u>17/</u></td> <td>NA</td> <td>1000</td> <td>1225</td> <td>1600</td> </tr> </tbody> </table>		Basic Allowance	Below 100	Basic Allowance	Below 100	f. Medical/Aid Station	NA	400	400	400	g. Publication Storage	5 SF/student	500	500	500	h. Mail Center	NA	400	500	600	i. Showers/Lockers <u>3/</u>	22 SF/TDA position	300	300	300	j. Toilets <u>18/</u>	3 SF/student	300	400	500	k. Physical Fitness Area <u>17/</u>	NA	1000	1225	1600
	Basic Allowance	Below 100	Basic Allowance	Below 100																																
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j. Toilets <u>18/</u>	3 SF/student	300	400	500																																
k. Physical Fitness Area <u>17/</u>	NA	1000	1225	1600																																

3 Education/ Classrooms 5/

	Student load by Class Size					
	Under 16	Under 25	16 to 31	32 to 48	49 to 71	72 to 150
a. Large Group Lectures <u>6/</u>	NA	NA	NA	NA	NA	25 SF/student
b. General Purpose <u>7/</u>	25 SF/student	25 SF/student	25 SF/student	25 SF/student	25 SF/student	25 SF/student
c. Small Group Seminar <u>8/</u>	NA	40 <u>9/</u> SF/student	NA	NA	NA	NA
d. Lab or applied Instruction						
e. General Purpose Training Bay <u>10/</u>	1 per every six maintenance students					
f. Lab Allowance	<u>11/</u>					
g. Resources Center <u>13/</u>	30 SF*20% of peak habitual student load					
	Student Peak Training Load					
	Basic Allowance	Below 100	Basic Allowance	Below 100		
h. Multi-Purpose Training Area	NA	5400	5800	6300		

i. Auditorium	NA	2000	2500	3000
j. Library	NA	600	600	600
k. Learning Center	NA	300	550	800
l. Distance Learning Center	NA	<u>5/</u>	<u>5/</u>	<u>5/</u>
m. Training Device/ Simulation Center	NA	<u>16/</u>	<u>16/</u>	<u>16/</u>
n. Training Aid Storage	NA	300	600	900
o. Audio Visual Storage	NA	300	600	900
p. Test Control Storage	NA	100	100	100

4 Dining Facility

a. Dining Area & Kitchen <u>19/</u>	NA	4100	4100	4100
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Notes:

1/ All allowances are in net square feet exclusive of interior and exterior walls. Total allowance for an item is the sum of the basic allowance and the allowance for the student load the educational facility is authorized. Per student in the basic allowance refers to the maximum number of students authorized to be at the TASS complex at any point during a training year.

2/ A net area of 2,700 square feet within the facility is authorized for an equipment cubage of 0 to 4,000 cubic feet.

2a/ Arms Vaults. One vault (600 square feet) if mission dictates and in a climate controlled area.

2b/ Unheated storage space. If total equipment cubage exceeds 4,000 cubic feet, a detached building or an equivalent area incorporated within the facility is authorized based on one of the following applicable categories:

Total Cubage In Cubic Feet	Net Square Feet (NSF) Authorized
4,001 to 8,000 NSF	= 0.6 x (Total Cubage minus 4,000)
Exceeds 8,000 NSF	= 2,400 + [0.2 x (Total Cubage minus 8,000)]

2c/ Heated storage space. A net area (minimum of 1,300 square feet) within the facility for an equipment cubage of 0 to 4,000 cubic feet as determined by the formula listed below.

$$\text{Heated Storage} = 0.6 \times \text{Total Cubage}$$

3/ This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

4/ If there are any conflicts between the criteria in this pamphlet and those of TRADOC for an educational facility teaching the same POI, the TRADOC criteria shall take precedence.

5/ Class size is determined by the supported class size as depicted in ATTRS, based on the class maximum.

5/ Space is authorized if validated and approved by ARNG-TR. This space is in addition to any classroom space otherwise authorized.

6/ These classrooms are intended for large group lectures IAW the POI up to 150 students. Since these are less frequently used than smaller classrooms in the conduct of the course, it is highly encouraged to provide separability (eg operable partitions) to break up the space into smaller classrooms where the larger proportion of academic instruction often takes place. (E.g.; a 72PN classroom can be subdivided into two 32 PN classrooms.)

7/ These classrooms are intended for general lecture accommodating up to 72 students using moveable tables and chairs permitting flexibility to adapt to different teaching modes, and providing for laptop use. The most common size for these classrooms is from 24 to 32 students. Like the larger group lecture classrooms, these classrooms can be further partitioned in order to increase overall utilization; e.g., a 72 PN classroom can be divided by an operable partition to accommodate two concurrent classes of 24 to 32 students each.

8/ These classrooms are small group discussion based and reflect the ALM 2015 and Industry trends for high engagement and "Instructor-facilitated" learning. These classrooms have furniture configured in a conference style or a tight "U"-shape. For courses that require accommodation of training aides or demonstration devices in the classrooms, adjust the Student station size accordingly. An additional allowance of 81 square feet for courses which require a visitor table or 2nd instructor.

9/ Add the net square foot area for the training devices simulators to be used for this category.

10/ General Purpose Training Bay (GPTB). The GPTB is configured the same as a SEMF General Purpose Work Bay (GPWB) plus egress aisles. Paragraph 3-3.d. describes a GPWB. Paragraph 3-3.d. (5) describes egress aisles.

11/ Lab must be justified through the school proponent. Determination must be made at the proponent level the suitable allocation of space.

12/ Conference and Counseling rooms support the POI requirement for student formal and informal counseling, evaluations, etc, as well as supporting the internal meeting needs of staff and instructors. 2/3 of these should be for Small of 8 to 10 (375 sqft), and Medium of 1/3 for 5 to 7 (150 sqft). Facility may consider one large 20 to 30 PN at 500 sqft in lieu of a Small or Medium. The Large may be sub dividable.

13/ Provide the student support spaces. These include resource centers, which are a study-related space that can accommodate bound print material, computers, and other resources to support student research. Resource centers provide quiet study areas with sufficient resources to support academic study in the program of instruction. Industry standard allowance is based on peak habitual student load.

14/ This space supports the ongoing and periodic refresh, repair, and maintenance of school IM/IS assets.

15/ This space supports the digital educational infrastructure accommodating only the school-owned assets such as servers and network switches. Outside plant and telecommunications closets to support the building are not included here but in the net-to-gross factor.

16/ Space is authorized if validated and approved by ARNG-TR.

17/ All equipment must be obtained with other than Federal construction funds.

18/ This allowance is to be split into appropriate facilities to support both men and women. The split should account for both minimum code requirements and anticipated building usage.

19/ Based on 200 person standard design to include all supporting functional areas. Dining facility authorized only if adequate dining facility is not otherwise available on the training center. Requires exception to criteria and ARNG-TR approval.

Table 6-2. Space Allowances for Educational Facility Billeting 1/

Pay Grade	Open Bay <u>2/</u>	2+2 <u>3/</u>	1 + 1 <u>3/</u>	Private
E4 and below	90 SF/person	90 SF/person	90 SF/person	NA
E5 and E6	90 SF/person	135 SF/person	135 SF/person	NA
E7 through E9	NA	250 SF/person	250 SF/person	250
W01, CW2, 01, 02	NA	NA	250 SF/person	250
CW3-CW5, O3-O6	NA	NA	NA	250
Lounge/ Vending	12 SF/person	12 SF/person	12 SF/person	12 SF/person
Laundry	144 SF/20 billeting spaces	144 SF/20 billeting spaces	144 SF/20 billeting spaces	144 SF/20 billeting spaces

Notes:

1/ Allowance is in net square feet, exclusive of: interior and exterior walls; necessary circulation space; a 20 square foot closet (2 closets in the 2+2 rooms). An educational complex is authorized to billet as many people as are shown on the approved student load plus the authorized TDA positions, including any authorized instructors not on the TASS TDA. States must justify the split among the three configurations of rooms and the construction of more than a single building containing billets. Billeting facilities are to comply with TRADOC Regulation 350-6 dated 7 Nov 2013 and DoD 4165.63-M, October 28, 2010.

2/ No more than ten persons per room/bay, all sharing a latrine of 500 square feet (not included in the allowance shown above).

3/ Two individuals per room sharing private bath/service area of 100 square feet (not included in the allowance shown above).

Appendix A References

AR 190-11

Physical Security of Arms, Ammunition, and Explosives (Cited in Table 4-2 (Note 14) and para 5-3c(7)(iii))

AR 190-51

Security of Unclassified Army Property (Sensitive and Non-Sensitive) (Cited in paras 1-9l and 4-5)

AR 385-10

The Army Safety Program (Cited in paras 5-3c(7)(i) and 5-3c(7)(ii))

AR 405-70

Utilization of Real Property (Cited in Table 2-1 (Note 10), Table 2-2 (Note 3), Table 2-4 (Note 5), and Table 6-1 (1b))

AR 420-1

Army Facilities Management (Cited in para 1-6i(1))

Army National Guard DG 415-1

Readiness Centers Design Guide (Cited in Table 2-1 (Note 6) and Table 5-8 (Note 4))

Army National Guard DG 415-2

Logistics Facilities Design Guide (Cited in Para 3-5d)

Army National Guard DG 415-3

Aviation Facilities Design Guide (Cited in Para 4-2c)

Army National Guard DG 415-4

Training Site Facilities Design Guide (Cited in paras 5-1b(23) and 6-1b(12))

Army National Guard DG 415-5

General Facilities Information Design Guide (Cited in para 1-9c(3))

DA Pam 190-51

Risk Analysis for Army Property (Cited in para)

DA Pam 350-38

Standards in Training Commission (Cited in para 5-3b)

DA Pam 385-64

Ammunition and Explosives Safety Standards (Cited in paras 5-3c(7)(i) and 5-3c(7)(ii))

DA Pam 415-28

Guide to Army Real Property Category Codes (Cited in Table 5-1 (Note 8))

DoD Space Planning Criteria for Health Facilities (Cited in Table 5-4 (Note 1))

FM 7-22

Army Physical Readiness Training (Cited in para 5-3c(12))

NGR 5-3

Army National Guard Training Centers (Cited in para 5-1a and 5-1b(1))

NG Pam 415-5

Army National Guard Military Construction Program Execution (Cited in para 3-3f)

NGR 415-10

Army National Guard Facilities Construction (Cited in paras 1-9d(v)a. and 1-9d(v)b.)

TC 25-8

Training Ranges (Cited in paras 5-3b(1), 5-3b(2), 5-3b(3) and Table 5-7)

TI 800-01

Design Criteria (Cited in Table 5-1 (Note 5))

TM 5-811-5

Army Aviation Lighting (Cited in paras 2-4(2) and 4-3c.)

TM 5-814-9

Central Vehicle Wash Facilities (Cited in paras 1-9t(6)(ii) and 5-2b(2))

UFC 1-200-02

High Performance and Sustainable Building Requirements (Cited in para 1-6f)

UFC 3-260-01

Airfield and Heliport Planning and Design (Cited in Table 2-2 (Note 16) and paras 4-2a, 4-2c and 4-2e)

UFC 3-400-02

Design: Engineering Weather Data (Cited in paras 1-9t(3), 1-9t(6)(iv), 1-9u(2), 4-2d(2), 5-2b(4) and Table 5-2 (Note 3))

UFC 4-010-01

DoD Minimum Antiterrorism Standards for Buildings (Cited in para 1-9d)

UFC 4-010-02

DoD Minimum Antiterrorism Standoff Distances for Buildings (Cited in para 1-9d)

UFC 4-010-05

Sensitive Compartmented Information Facilities Planning, Design, and Construction (Cited in para 2-7)

UFC 4-510-01

Military Medical Facilities (Cited in Table 2-3, Note 1)

UFC 4-730-10

Fire Stations (Cited in Table 5-13 (Note 1))

USATCESP 385-02

Explosives Safety Site Plan Developers Guide (Cited in para 5-3c(7)(i))

Section II

Related Publications

A related publication is a source of additional information. The reader does not have to read it to understand this publication.

AR 25-1

Army Information Technology

AR 40-5

Preventive Medicine

AR 55-80

DoD Transportation Engineering Program

AR 190-13

The Army Physical Security Program

AR 200-1

Environmental Protection and Enhancement

AR 385-63

Range Safety

29 CFR Part 1900 et seq

Occupational Safety and Health Administration, Department of Labor

36 CFR Part 800

Protection of Historic Properties

DoD 6055.09-M, Volume 1

DoD Ammunition and Explosives Safety Standards: General Explosives Safety Information and Requirements

DoDD 1225.07

Reserve Component Facilities Programs and Unit Stationing

DoDD 4270.5

Military Construction

DoDD 6055.9E

Explosives Safety Management and the DoD Explosives Safety Board

DoDI 1225.8

Programs and Procedures for Reserve Component Facilities Programs and Unit Stationing

Executive Order 11988

Floodplain Management

Executive Order 11990

Protection of Wetlands

Executive Order 12856

Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements

Executive Order 12873

Federal Acquisition, Recycling, and Waste Prevention

Executive Order 13007

Indian Sacred Sites

Executive Order 13045

Protection of Children from Environmental Health Risks and Safety Risks

MIL-STD-3007

Standard Practice For Unified Facilities Criteria And Unified Facilities Guide Specifications

NG Pam 210-20

Real Property Development Planning Procedures for The Army National Guard

NGR (AR) 200-3
State and Federal Environmental Responsibilities

NGR 350-1
Army National Guard Training

NGR 415-5
Army National Guard Military Construction Program Development and Execution

TM 5-683
Electrical Interior Facilities

TM 5-684
Electrical Exterior Facilities

TM 5-803-14
Site Planning and Design

UFC 3-340-02
Structures to Resist the Effects of Accidental Explosions

UFC 4-020-01
DoD Security Engineering Facilities Planning Manual

Other Unified Facilities Criteria as appropriate

Uniform Building Code

10 U.S.C. §172
Ammunition Storage Board

10 U.S.C. Chapter 159
Real Property

10 U.S.C. Chapter 169
Military Construction and Military Family Housing

10 U.S.C. Chapter 1803
Facilities for Reserve Components

15 U.S.C. §§2601-2692
Toxic Substances Control Act

16 U.S.C. § 470 et. seq.
National Historic Preservation

16 U.S.C. §§1271-1287
Wild and Scenic Rivers Act

16 U.S.C. §§1531-1544
Endangered Species Act.

18 U.S.C §1001
Fraud and False Statements

33 U.S.C. §1251 et. seq.
Clean Water Act

40 U.S.C. §1101 et seq
Selection of Architects and Engineers

42 U.S.C. §300f et. seq.
Safe Drinking Water Act

42 U.S.C. §1996
American Indian Religious Freedom Act

42 U.S.C. §§4151-4157
Architectural Barriers Act of 1968

42 U.S.C. §§4321-4370a
National Environmental Policy Act

42 U.S.C. §§6901-6992
Resource Conservation and Recovery Act

42 U.S.C. §§7401-7661
Clean Air Act

42 U.S.C. §§9601-9657
Comprehensive Environmental Response, Compensation and Liability Act

32 CFR Part 651
Environmental Analysis of Army Actions

Section III
Prescribed Forms
This section contains no entries.

Section IV
Referenced Forms

DD Form 1390
Military Construction Program

DD Form 1391
Military Construction Project Data

Glossary

Section I Abbreviations

AASF

Army Aviation Support Facility

AEOC

Aviation Emergency Operations Center

AGR

Active Guard/Reserve

ALSE

Aviation Life Support Equipment

APFT

Army Physical Fitness Test

AR

Army Regulation

ARFF

Aircraft Rescue and Firefighting Facility

ARNG

Army National Guard

ARNG-AV

Army National Guard Aviation & Safety Division

ARNG-CSG-P

Army National Guard Industrial Hygiene

ARNG-FM

Army National Guard Force Management Division

ARNG-ILI

Army National Guard Installations Division

ARNG-IMG-G

Army National Guard Governance and Policy Branch

ARNG-TR

Army National Guard Training Division

ARTEP

Army Training and Evaluation Program

ASET

Aircraft Survivability Equipment Trainer

ASP

Ammunition Supply Point

AT

Annual Training

AT/FP

Anti-Terrorism/Force Protection

ATS

Automated Target System

Auth

Authorized

AVCATT

Aviation Combined Army Tactical Trainer

Bde

Brigade

BEQ

Bachelor Enlisted Quarters

BII

Basic Issue Items

Bn

Battalion

BOQ

Bachelor Officer's Quarters

CFMO

Construction and Facilities Management Officer

CHS

Common Hardware Software

Civ

Civilian

CMDSA

COMSEC Material Direct Support Activities

Co

Company

COMSEC

Communication security

COR

Contracting Officer's Representative

CRC

Component Repair Company

CSMS

Combined Support Maintenance Shop

CSSAMO

Combat Service Support Automation Management Office

CTA
Common Table of Allowances

CTC
Collective Training Center

CTF
Concurrent Training Facility

CV
Combat vehicles

CWHF
Controlled Waste Handling Facility

DA
Department of the Army

DARNG
Director of Army National Guard

DD
Department of Defense

DDESB
Department of Defense Explosives Safety Board

DG
Design Guide

Div
Division

DoD
Department of Defense

DoDD
Department of Defense Directive

DoDI
Department of Defense Instruction

DS4
Direct Support Unit Standard Supply System

DSU
Direct Support Unit

ECS
Electronic Consult System

EMCS
Energy Management Control System

EST
Engagement Skills Trainer

FAA

Federal Aviation Administration

FISP

Federal Inventory and Support Plan

FM

Field Manual

FMS

Field Maintenance Shop

GIB

General Instruction Building

GIS

Geographic Information Systems

GPM

Gallons per Minute

GPTB

General Purpose Training Bay

GPWB

General Purpose Work Bay

GSA

General Services Administration

GSE

Ground support equipment

GSU

General Support Unit

HAZMAT

Hazardous Materials

HEMTT

Heavy Expanded Mobility Tactical Truck

HET

Heavy Equipment Transporter

HHC

Headquarters and Headquarters Company

HHD

Headquarters and Headquarters Detachment

IAW

In Accordance With

IBD

Inhabited Building Distance

IDT

Inactive Duty Training

IT

Information Technology

ITC

Intermediate Training Center

JFHQ

Joint Force Headquarters

JOC

Joint Operations Center

KD

Known Distance

LAASF

Limited Army Aviation Support Facility

LTA

Local Training Area

LTC

Local Training Center

LUH

Light Utility Helicopter

MAINT

Maintenance

MATES

Maneuver Area Training Equipment Site

MCNG

The Army National Guard Military Construction appropriation

MCOFT

Mobile Conduct of Fire Trainer

MEDEVAC

Medical evacuation

MEVA

Mission Essential Vulnerability Area

MILES

Multiple Integrated Laser Engagement System

MOUT

Military Operations on Urbanized Terrain

MTC-H

Maneuver Training Center - Heavy

MTC-L

Maneuver Training Center - Light

MWR

Morale, Welfare, and Recreation

MTOE

Modified Table of Organization and Equipment

NA

Not Authorized

NG

National Guard

NGB

National Guard Bureau

NGR

National Guard Regulation

NSF

Net Square Feet

Pam

Pamphlet

PLS

Palletized Load System

POI

Program of Instruction

POL

Petroleum Oil Lubricants

POV

Privately owned vehicle

QDA

Quantity Distance Arc

RAOC

Rear Area Operations Center

RAPIDS

Real-Time Automated Personnel Identification System

Rat

Ration

RMAG

Reinforced Above Ground Magazines

RPDP

Real Property Development Plan

RWOS

Representative Weather Observation Station

RXA

Repair/Direct Exchange

SAMS

Standard Army Maintenance System

SB

Supply Bulletin

SDP

Site Development Plan

SDZ

Surface Danger Zone

SEMF

Surface Equipment Maintenance Facility

SF

Square Feet

SIPRNET

Secure Internet Protocol Router Network

SP

Self-propelled

SPWB

Special Purpose Work Bay

SQ YD

Square Yard

SRM

Sustainment, Restoration, and Modernization

SRP

Soldier Readiness Processing

SSA

Supply Support Activity

STAMIS

Standard Army Management Information System

Sup

Supply

SY

Square Yard(s)

TADSS

Training Aids, Devices, and Simulations Systems

TASC

Training Aids Support Center

TASS

The Army School System

TC

Training Circular

TDA

Table of Distribution and Allowances

Tech

Military Technician

TI

Technical Instruction

TISA

Troop Issue Subsistence Activity

TM

Technical Manual

TMC

Troop Medical Clinic

TOE

Table of Organization and Equipment

TRADOC

U.S. Army Training and Doctrine Command

TSB

Training Support Brigade

UFC

Unified Facilities Criteria

ULLS-A

Unit Level Logistics System – Aviation

USATCESP

U.S. Army Technical Center for Explosives Safety Publication

U.S.C.

United States Code

USPFO

United States Property and Fiscal Office

UTES

Unit Training and Equipment Site

UXO

Unexploded Ordnance

WB

Work Bay (General Purpose, Special Purpose Work Bay, and or Maintenance Training Work Bay)

WWMCCS

Worldwide Military Command and Control System

Section II Terms

Collocated Facilities

ARNG facilities are considered to be collocated if they have at least one adjacent land-use area boundary in common or are separated only by the width of the vehicle thoroughfare.

Combat Vehicle

For the purpose of this regulation, the term combat vehicles includes tanks, armored personnel carriers, tracked command and reconnaissance vehicles, combat engineer vehicles, self-propelled artillery, tank retrievers and other like type vehicles.

Construction

The erection, installation, or assembly of a new facility; the relocation of a facility; the complete replacement of an existing facility; or the addition, expansion, extension, alteration, or conversion (to a new type use) of an existing facility. This includes installed building equipment and related site preparation, excavation, filling and landscaping or other land improvements. It also includes increases in components of facilities for functional reasons when a facility is not being repaired and the components are not required to meet current standards, and it includes the extension of utilities to areas not previously served. Construction is an activity that may be a part of either the restoration or modernization program.

Construction Specifications Institute (CSI)

A non-profit organization dedicated to the advancement of construction technology through communication, education, research and service. CSI serves the interest of architects, engineers, contractors, product manufacturers and others in the construction industry.

Facility

A separate and individual building, structure, utility system, or other real property improvement. It includes supporting elements for structures, such as sidewalks, fire hydrants, gasoline and diesel fuel dispensing systems, flammable materials buildings, roads, fencing, and hard stand.

Federal Funds

The terms "Federal funds" or "Federal costs" refers to funds appropriated for the Army National Guard Military Construction (MCNG) program. It does not include appropriations funding the non-construction aspects of the project. However, in the case of a joint use facility, it may include construction appropriation funds contributed by the other reserve component(s). Also, in the case of projects that fall within the statutory limits of operations and maintenance construction, it refers to the Operations and Maintenance National Guard appropriation (but only that portion supporting the construction aspects of the project).

Floodplain

Floodplains are the lowland and relatively flat areas next to inland and coastal waters including flood prone areas of offshore islands. This includes, at a minimum, that area with a one percent or greater chance of flooding in any given year (the "100 year flood"). For critical facilities where evacuation would be difficult, such as hazardous chemical storage or hospitals, the floodplain will be that area subject to a 0.2 percent or greater chance of flooding in any given year (the "500 year flood").

Green Building

Green Building or High Performance/Sustainable Building (HPSB) is constructed using the Guiding Principles, an integrated synergistic approach. For more information refer to NG Design Guide 415-5

Hardstand

This is an area constructed of crushed stone, gravel, slag, shale, or similar materials. These materials are shaped and compacted into position without the addition of any binder materials.

Installation

An aggregation of contiguous or near contiguous, common mission-supporting real property holdings under the jurisdiction of the State, the District of Columbia, territory, or commonwealth controlled by and at which an ARNG unit or activity is permanently assigned. For the purpose of Installation Status Report reporting and the calculation of programming inventory, each State shall be considered a separate installation. However, for real property inventory reporting, each entity with a FISP installation number shall be reported as an installation.

Building Life-Cycle Cost Analysis (BLCCA)

An economic assessment of an item, system, feature, or facility by considering all significant costs of ownership over an economic life, expressed in terms of equivalent costs. Such an analysis of economic results in a determination as to whether any increase in initial construction cost due to inclusion of the feature or system would be recouped during its lifetime by decreases in operating and/or maintenance costs, when calculated in discounted dollars and using documentable current local fuel cost and escalation forecasts as prepared by the Office of the Secretary of Defense.

MATES with Support

An SEMF that performs both field and sustainment level maintenance missions. A MATE with Support is typically not collocated with a CSMS since the CSMS performs the same sustainment maintenance mission as a MATES with Support.

MATES without Support

This SEMF performs only field level maintenance missions. The MATES without Support is typically collocated with a CSMS.

Military Vehicles

Any motorized or towed-vehicles, wheeled or track, authorized to units by TOE, MTOE, or TDA.

Motor Vehicle

Motor vehicles are self-propelled military equipment, including amphibious equipment, classed as 1/4-ton or over in size.

Pre-Wired Workstations

A workstation which should include posts, panels, partitions, wiring for electricity and communications, task lighting, and partition-hung components to support individual and group efforts. Both panel-to-panel and post-to-panel systems are acceptable. Additional system components are ambient lighting and partition supported files. A pre-wired workstation should, at a minimum, provide for the following functions: (1) An acoustically treated enclosure defining the limits of an individual or a shared use workstation. (2) Adequate work surfaces to accommodate the individual's equipment, writing, and work layout needs. (3) Storage space for individual files and supplies. (4) Task lighting and electrical and communications outlets to support the individual's equipment. Pre-wired workstations do not include movable furniture and furnishings such as chairs, stand alone file cabinets, coat hooks or racks, name tags, in and out file trays, and other similar accouterments.

Peak Habitual Training Load

The peak habitual training load is the training population used in calculating an RTI, by identifying the courses projected student load for all course are taught simultaneously. The number is generated from the reported Class Maximum number in ATTRS by class and school code. The compiled number does not include multiple phases of the same course or multiple sessions of the same course, rather will only capture the higher of the multiple class sizes.

Replacement

Reconstruction of a real property facility destroyed or damaged beyond the point at which it may be economically repaired. Complete replacement is classified as construction.

Site Preparation

Clearing; grubbing; demolition of existing structures; removing existing utilities, excavation and

embankment earth work, drainage channels or systems, and retaining walls; the grading/compaction of site soils to proposed subgrade elevations; and necessary environmental compliance actions.

Surface Danger Zone (SDZ)

The statistical area in which a particular round fired from a particular weapon at a particular point toward a particular target will impact if there are no physical barriers to impede its path.

Sustainable Design and Development

The systematic consideration of current and future impacts of an activity, product, or decision on the environment, energy use, natural resources, the economy, and quality of life. In terms of military construction, it is also the design, construction, operation, and reuse/removal of the built environment (infrastructure and buildings) in an environmentally and energy efficient manner.

UTES

This SEMF performs field level maintenance on the vehicles and equipment stored at the facility to support training activities at a nearby ARNG training center or active duty post.

Wetlands

Wetlands are those areas flooded or inundated by surface or ground waters often enough to support aquatic life or vegetation. Wetlands generally include swamps, marshes, bogs, and similar areas, such as sloughs, open or wet meadows, river outflows, mud flats, natural ponds, wet forests, potholes, and riparian areas. They may or may not be located in flood plains.

Section III

Special Abbreviations and Terms

This section contains no entries.

ATTACHMENT G

ROOM REQUIREMENTS

MOTEL CONCEPT

VILLAGE CONCEPT



TETRA TECH

ATTACHMENT G - MOTEL CONCEPT

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 101A thru 107A, 110A thru 116 A & 201A thru 216 A Senior Leaders' Quarters (SLQ) Suite
Size (s.f.): _____ Occupancy (FT/PT): 1 Function: Billeting

ARCHITECTURAL

Finishes: _____
Floor: Sleeping Room: Carpet Bathroom: Tile
Walls: Sleeping Room: Paint Bathroom: Paint and Tile walls at tub/shower only
Ceiling: Paint
Clear Ceiling Height: Sleeping: 9'-0" Closet/Bathroom areas: 9'-0"
Windows: _____
Doors: Solid core wood
Adjacencies: _____
Features: _____
Furnishing: Full size bed, Dresser, Nightstand with a lamp, Desk and chair, Lounge chair, Microwave, Small undercounter Refrigerator.

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Req'd Air Conditioning: Req'd Ventilation: Req'd
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: On demand water heater, Porcelain bathroom fixtures.
 Equipment Air: Floor Drains:
Shop Air:
Natural Gas: Req'd Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

LAN: PA:
Telephone: _____
Lighting: Overhead LED fixtures
Special Requirements: _____
Security: _____

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 108, 109, 207, 208, Senior Leaders' Quarters (SLQ) ADA Suite

Size (s.f.): _____ Occupancy (FT/PT): 1 _____ Function: Billeting

ARCHITECTURAL

Finishes: _____
Floor: Sleeping Room: Carpet Bathroom: Tile
Walls: Sleeping Room: Paint Bathroom: Paint and Tile walls at tub/shower only
Ceiling: Paint
Clear Ceiling Height: Sleeping /Study Room: 9'-0" Closet/Bathroom areas: 9'-0"
Windows: _____
Doors: Solid core wood
Adjacencies: _____
Features: All spaces have ADA/ABA compliant clearances. Bathroom Room has ADA/ABA accessories.
Furnishing: Full size bed, Dresser, Nightstand with a lamp, Desk and chair, Lounge chair, Microwave, Small undercounter Refrigerator.

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: _____
Ceiling: _____
Features: _____

HVAC

Heating: Req'd Air Conditioning: Req'd Ventilation: Req'd
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: On demand water heater, porcelain bathroom fixtures,
 Equipment Air: Floor Drains:
Shop Air:
Natural Gas: Req'd Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system
Hazard Classification: _____
Detection: _____

ELECTRICAL

LAN: PA:
Telephone: _____
Lighting: Overhead LED fixtures
Special Requirements: _____
Security: _____

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 117 & 217 Lounge, Vending & Laundry
Size (s.f.): _____ Occupancy (FT/PT): Transient, Varies Function: Common use Laundry/Lounge Room

ARCHITECTURAL

Finishes: _____
Floor: VCT on Slab
Walls: Paint
Ceiling: Paint
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Solid core wood
Adjacencies: _____
Features: _____
Furnishing: Full size bed, Dresser, Nightstand with a lamp, Desk and chair, Lounge chair, Microwave, Small undercounter Refrigerator.

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Req'd Air Conditioning: Req'd Ventilation: Req'd
Temperature: Heating – 68/55 , Cooling 78/85
Special Requirements: _____

PLUMBING

Fixtures: On demand water heater, Washer water and drain piping
 Equipment Air: Floor Drains:
Shop Air:
Natural Gas: Req'd Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

LAN: PA:
Telephone: _____
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: Commercial Washer Dryer, (2) Food/Drink Vending Machines
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 118, Information Technology
Size (s.f.): _____ Occupancy (FT/PT): _____ Function: IT

ARCHITECTURAL

Finishes: _____
Floor: Slab
Walls: OTS
Ceiling: OTS
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: hollow metal
Adjacencies: _____
Features: _____
Furnishing: _____

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Air Conditioning: Ventilation:
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: _____
Shop Air: Equipment Air: Floor Drains:
Natural Gas: Other: _____

FIRE PROTECTION

System Type: Building wide fire suppression system
Hazard Classification: _____
Detection: _____

ELECTRICAL

Telephone: LAN: PA:
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 119, Mechanical / Electrical Storage

Size (s.f.): _____ Occupancy (FT/PT): _____ Function: _____

ARCHITECTURAL

Finishes: _____
Floor: Slab
Walls: OTS
Ceiling: OTS
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Hollow metal
Adjacencies: _____
Features: _____
Furnishing: _____

STRUCTURAL

Floor: Concrete Slab: 1st FI on grade, 2nd FI on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Air Conditioning: Ventilation:
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: _____
Shop Air: Equipment Air: Floor Drains:
Natural Gas: Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

Telephone: LAN: PA:
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFGI: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 217, Maintenance / Storage

Size (s.f.): _____ Occupancy (FT/PT): _____ Function: Maintenance & Storage

ARCHITECTURAL

Finishes: _____

Floor: Slab

Walls: OTS

Ceiling: OTS

Clear Ceiling Height: 9'-0"

Windows: _____

Doors: Hollow Metal

Adjacencies: _____

Features: _____

Furnishing: Storage shelving

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system

Walls: Bearing and non-Bearing cold form metal studs

Ceiling: Cold form metal studs or standard steel trusses

Features: _____

HVAC

Air Conditioning:

Ventilation:

Heating:

Temperature: Comply with UFC

Special Requirements: _____

PLUMBING

Fixtures: _____

Equipment Air:

Floor Drains:

Shop Air:

Natural Gas:

Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification

Hazard Classification: _____

Detection: _____

ELECTRICAL

LAN:

PA:

Telephone:

Lighting: Overhead LED fixtures

Special Requirements: Rough in for CCTV

Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____

Other: _____

GFGI: _____

OTHER COMMENTS (Add Continuation Sheets)

ATTACHMENT G - VILLAGE CONCEPT

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – VILLAGE OPTION

Space: 101-105, 115-119 Senior Leaders' Quarters (SLQ)
Size (s.f.): _____ Occupancy (FT/PT): 1 Function: Billeting

ARCHITECTURAL

Finishes: _____
Floor: Sleeping Room: Carpet
Walls: Sleeping Room: Paint
Ceiling: Paint
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Solid core wood
Adjacencies: _____
Features: _____
Furnishing: Full size bed, Dresser, Nightstand with a lamp, Desk and chair, Lounge chair, Microwave, Small undercounter Refrigerator.

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Req'd Air Conditioning: Req'd Ventilation: Req'd
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: _____
 Shop Air: _____ Equipment Air: Floor Drains:
 Natural Gas: Req'd Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

Telephone: _____ LAN: PA:
Lighting: Overhead LED fixtures
Special Requirements: _____
Security: _____

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL OPTION

Space: 103, 104, 117, 118 Bathrooms & ADA Bathrooms
Size (s.f.): _____ Occupancy (FT/PT): 1 Function: Billeting

ARCHITECTURAL

Finishes: _____
Floor: Tile
Walls: Paint and Tile walls at tub/shower only
Ceiling: Paint
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Solid core wood
Adjacencies: _____
Features: ADA spaces have ADA/ABA compliant clearances and ADA/ABA accessories.
Furnishing: _____

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: _____
Ceiling: _____
Features: _____

HVAC

Heating: Req'd Air Conditioning: Req'd Ventilation: Req'd
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: On demand water heater, porcelain bathroom fixtures,
 Equipment Air: Floor Drains:
Shop Air:
Natural Gas: Req'd Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system
Hazard Classification: _____
Detection: _____

ELECTRICAL

LAN: PA:
Telephone: _____
Lighting: Overhead LED fixtures
Special Requirements: _____
Security: _____

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFGI: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – VILLAGE OPTION

Space: 111-113 Lounge, Kitchen & Laundry
Size (s.f.): _____ Occupancy (FT/PT): Transient, Varies
Function: Common use Laundry/ Living Room / Kitchen

ARCHITECTURAL

Finishes: _____
Floor: LVT on Slab, Laundry room & closet: Tile, HW closet: conc.
Walls: Paint
Ceiling: Paint
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Solid core wood
Adjacencies: _____
Features: _____
Furnishing: Full size bed, Dresser, Nightstand with a lamp, Desk and chair, Lounge chair, Microwave, Small undercounter Refrigerator.

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Req'd Air Conditioning: Req'd Ventilation: Req'd
Temperature: Heating – 68/55 , Cooling 78/85
Special Requirements: _____

PLUMBING

Fixtures: On demand water heater, Washer water and drain piping
Equipment Air: Floor Drains:
Shop Air:
Natural Gas: Req'd Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

LAN: PA:
Telephone: _____
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: Commercial Washer Dryer, refrigerator, stove/ oven, microwave
GFGI: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – VILLAGE OPTION

Space: 121, Information Technology (ADA Unit only)

Size (s.f.): _____ Occupancy (FT/PT): _____ Function: IT

ARCHITECTURAL

Finishes: _____
Floor: Slab
Walls: OTS
Ceiling: OTS
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: hollow metal
Adjacencies: _____
Features: _____
Furnishing: _____

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Air Conditioning: Ventilation:
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: _____
Shop Air: Equipment Air: Floor Drains:
Natural Gas: Other: _____

FIRE PROTECTION

System Type: Building wide fire suppression system
Hazard Classification: _____
Detection: _____

ELECTRICAL

Telephone: LAN: PA:
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – MOTEL
OPTION

Space: 123, Mechanical / Electrical Storage (ADA Unit Only) Function: _____
Size (s.f.): _____ Occupancy (FT/PT): _____

ARCHITECTURAL

Finishes: _____
Floor: Slab
Walls: OTS
Ceiling: OTS
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Hollow metal
Adjacencies: _____
Features: _____
Furnishing: _____

STRUCTURAL

Floor: Concrete Slab: 1st FI on grade, 2nd FI on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Air Conditioning: Ventilation:
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: _____
Shop Air: Equipment Air: Floor Drains:
Natural Gas: Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

Telephone: LAN: PA:
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFGI: _____

OTHER COMMENTS (Add Continuation Sheets)

INDIVIDUAL SPACE CRITERIA DATA SHEET

Delaware Army National Guard.
BBTS Barracks, Bethany Beach, DE

Group: Transient Training Officer's Quarters – VILLAGE OPTION

Space: 122, Maintenance / Storage (ADA Unit Only)

Size (s.f.): _____ Occupancy (FT/PT): _____ Function: Maintenance & Storage

ARCHITECTURAL

Finishes: _____
Floor: Slab
Walls: OTS
Ceiling: OTS
Clear Ceiling Height: 9'-0"
Windows: _____
Doors: Hollow Metal
Adjacencies: _____
Features: _____
Furnishing: Storage shelving

STRUCTURAL

Floor: Concrete Slab: 1st Fl on grade, 2nd Fl on metal deck on steel post and beam system
Walls: Bearing and non-Bearing cold form metal studs
Ceiling: Cold form metal studs or standard steel trusses
Features: _____

HVAC

Heating: Air Conditioning: Ventilation:
Temperature: Comply with UFC
Special Requirements: _____

PLUMBING

Fixtures: _____
Shop Air: Equipment Air: Floor Drains:
Natural Gas: Other: _____

FIRE PROTECTION

System Type: Building wide Fire Suppression system and Fire Alarm with Mass Notification
Hazard Classification: _____
Detection: _____

ELECTRICAL

Telephone: LAN: PA:
Lighting: Overhead LED fixtures
Special Requirements: Rough in for CCTV
Security: Card Reader at exterior door

EQUIPMENT

Cranes & Hoists: _____
Other: _____
GFG: _____

OTHER COMMENTS (Add Continuation Sheets)

ATTACHMENT H

LEED V4 - CHECKLIST



TETRA TECH



LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name: BBTs Transient Training Officer Barracks, Bethany Beach, DE
 Date: 3/3/2023

Y	?	N	Credit	Integrative Process	1
3	0	28	16	Location and Transportation	16
			16	LEED for Neighborhood Development Location	1
			1	Sensitive Land Protection	2
			1	High Priority Site	5
			5	Surrounding Density and Diverse Uses	5
			5	Access to Quality Transit	1
			1	Bicycle Facilities	1
			1	Reduced Parking Footprint	1
			1	Green Vehicles	1
3	0	0	10	Sustainable Sites	10
			10	Construction Activity Pollution Prevention	Required
			1	Site Assessment	1
			2	Site Development - Protect or Restore Habitat	2
			1	Open Space	1
			3	Rainwater Management	3
			2	Heat Island Reduction	2
			1	Light Pollution Reduction	1
3	0	8	11	Water Efficiency	11
			11	Outdoor Water Use Reduction	Required
			11	Indoor Water Use Reduction	Required
			2	Building-Level Water Metering	Required
			6	Outdoor Water Use Reduction	2
			2	Indoor Water Use Reduction	6
			2	Cooling Tower Water Use	2
			1	Water Metering	1
18	0	2	33	Energy and Atmosphere	33
			33	Fundamental Commissioning and Verification	Required
			33	Minimum Energy Performance	Required
			33	Building-Level Energy Metering	Required
			33	Fundamental Refrigerant Management	Required
			6	Enhanced Commissioning	6
			11	Optimize Energy Performance	18
			1	Advanced Energy Metering	1
			1	Demand Response	2
			3	Renewable Energy Production	3
			1	Enhanced Refrigerant Management	1
			2	Green Power and Carbon Offsets	2
10	0	0	13	Materials and Resources	13
			13	Storage and Collection of Recyclables	Required
			13	Construction and Demolition Waste Management Planning	Required
			5	Building Life-Cycle Impact Reduction	5
			2	Building Product Disclosure and Optimization - Environmental Product Declarations	2
			2	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
			2	Building Product Disclosure and Optimization - Material Ingredients	2
			2	Construction and Demolition Waste Management	2
16	0	0	16	Indoor Environmental Quality	16
			16	Minimum Indoor Air Quality Performance	Required
			16	Environmental Tobacco Smoke Control	Required
			2	Enhanced Indoor Air Quality Strategies	2
			3	Low-Emitting Materials	3
			1	Construction Indoor Air Quality Management Plan	1
			2	Indoor Air Quality Assessment	2
			1	Thermal Comfort	1
			2	Interior Lighting	2
			3	Daylight	3
			1	Quality Views	1
			1	Acoustic Performance	1
2	0	0	6	Innovation	6
			6	Innovation	5
			1	LEED Accredited Professional	1
1	0	0	4	Regional Priority	4
			4	Regional Priority: Specific Credit	1
			1	Regional Priority: Specific Credit	1
			1	Regional Priority: Specific Credit	1
			1	MRC1: Building Life-Cycle Impact Reduction	1
56	0	38	110	TOTALS	Possible Points: 110
					Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110

ATTACHMENT I

DESIGN PROCESS AND SUBMITTAL REQUIREMENTS MANUAL OUTLINE



TETRA TECH

DE ARMY NATIONAL GUARD
Design Process and Submittal Requirements

PART C
DESIGN/BUILD -- DESIGN SUBMITTAL
REQUIREMENTS AFTER AWARD

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APPENDIX TOC

(Separately bound)

APPENDIX 1 – BIM INSTRUCTIONS

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APPENDIX 3 – BIM SUBMITTAL REQUIREMENTS FOR DESIGN BUILD

Design Process and Submittal Requirements

PART C – DESIGN/BUILD -- DESIGN SUBMITTAL REQUIREMENTS AFTER AWARD

Chapter 1.0 – ALL DISCIPLINES

1.1 GENERAL

This portion of the Design Process and Submittal Requirements manual describes development of project detailed designs – the working drawings, specifications and other documents comprising the completed project design documents. It applies to the design performed by the successful Design/Build (D/B) contractor after project award.

1.2 REFERENCE DOCUMENTS

D/B project design and construction are to comply with the Government criteria documents listed in Section 01 02 00.00 48 Statement of Work, Chapter 2.

Note: The Army National Guard applies a “more commercial construction industry” approach to Design/Build projects than is typically applicable to D/B/B projects. Section 01 02 00.00 48 Statement of Work, Chapter 2, lists a limited number of standard Federal and military criteria that will be applicable to Army National Guard D/B projects.

The Army National Gurad’s approach to D/B projects is also more prescriptive than some other Federal agencies, and most private-sector clients.

1.3 ENERGY CONSERVATION AND LIFE CYCLE COST ANALYSIS

Provide life cycle cost analyses (LCCA) and Energy Analyses on all buildings as required to ensure compliance with the Energy Policy Act of 2005. Period of LCCA shall be based on the life of the building. Minimum building will be as described in Informative Appendix G of ASHRAE Standard 90.1-2004. LCCA must meet the requirements described in 10 CFR part 436 subpart A - Methodology and Procedures for Life Cycle Cost Analyses. Provide a summary of the information provided to state the percentage reduction in energy usage over ASHRAE 90.1-2004, the betterments over the minimum building, describing systems and equipment compared, reasons for choices selected and calculation summary. The energy conservation narrative is a cooperative narrative and is not the responsibility of one discipline, overall responsibility of this narrative will be determined by the Designer's PDT.

1.4 CADD and BIM (Building Information Model)

CADD requirements for this project are defined in SECTION 01 02 00.00 48 – STATEMENT OF WORK.

BIM requirements for this project are defined in the RFP, Section 01 03 00.00 48 DESIGN SUBMISSION REQUIREMENTS AFTER AWARD. When BIM is required, all design drawings will be created using Building Information Modeling (BIM) technology and shall conform to the Tri-Service A/E/C CADD Standards (latest release). The AE will make the Building Information Model (BIM) and the supporting data set/library that supports the BIM available to the Government in electronic format.

Refer to Appendix 1 and Appendix 3 for a comprehensive overview of BIM and its application to the design process and submittals required for D/B projects

1.5 CHARRETTE DESIGN MEETING AND SUBMITTAL; REVISED CHARRETTE DOCUMENT AND SUBMITTAL

1.5.1 General.

A Design Charrette is called for and described in the 01 02 00.00 48 Statement of Work. This Charrette will be part of the project design process. In the charrette, the Contractor's designers provide alternative site and building design concepts for Government review and consideration. The charrette process will culminate in site and building design concepts accepted by the Government for development into the final project design and documents.

1.5.2 Pre-Charrette Actions.

1.5.2.1 The Contractor's design team will prepare for the charrette design meeting. One week prior to the meeting, Designer shall send the charrette documents in pdf format to the charrette meeting participants. Electronic submissions via ftp, an agreed groupware tool such as Microsoft Groove, or email (size permitting) will be acceptable. Design team shall prepare and send out the following documents ahead of the charrette meeting:

- a. Site plan and floor plan reflecting the accepted plans
- b. Floor plan shall be color coded by Unit occupying the building. Provide annotation of the units occupying the building for each drill weekend.
- c. A draft narrative description of the major systems, including roof material, exterior skin, windows, doors, mechanical units, electrical, structure, finishes, fire protection, mass notification, IT, and any special systems.
- d. A draft narrative description of Site characteristics, and any special site considerations, site utilities, permits, and foundations, to the extent known.
- e. Space Allocation Table. Provide in the same format as the Functional Space Details Worksheet, which is part of the 5034R project documentation (provided by PM after award.)
- f. Value Engineering Change Proposals (VECP), if any. Refer to Section 00 80 00.00 06, the paragraph "VALUE ENGINEERING AFTER AWARD (June 1999)".
- g. The charrette agenda. Agenda should include breakout sessions by discipline.

1.5.3 Charrette Meeting.

The Charrette takes place on or near the site and uses a charrette process to arrive at a mutually acceptable design solution. This process is characterized by an informal and free exchange of information and ideas between users and designers that establish project requirements. Charrette participants are encouraged to bring their ideas to the meeting, with no formal comment collection and response required or desired beforehand. A typical design team consists of the designer's project manager, lead architect, civil engineer, interior design, electrical/IT, mechanical engineer and CADD/BIM technical support.

- 1.5.3.1 Design Process. Design decisions at this meeting are intended to result in a thought-through solution, suitable for development as the final design. It should be emphasized to all team members that this is the case. Attendees must be decision-makers. See further description of the charrette objectives in 01 02 00.00 48 Statement of Work, under subparagraph Design Objectives.
- 1.5.3.2 Color Scheme. The design team shall bring for discussion color samples of interior and exterior finishes of the selected color scheme.
- 1.5.3.3 Facilities. Administrative support is crucial to this type of process. The facility meeting room and location requirements are described in Section 01 03 00.00 48

DESIGN SUBMISSIONS AFTER AWARD, paragraph "Submission of Design Documents", the subparagraph describing predesign, partnering and charrette meeting locations and arrangements. The facility will have workspace with chairs, tables, and sufficient electrical outlets to accommodate the use of computers. The designers use Revit software for the design during the meeting, and some other attendees will probably bring laptops as well. The design team will provide computers, software, overhead projectors, presentation materials and equipment needed on site to produce CADD design files, small (8.5 x 11 inch) design drawings, and meeting minutes. Design team will provide 1 full-sized set of the drawings described above under subparagraph "Precharrette Actions", and may wish to bring additional spare reduced-size copies of the drawings for anyone who does not have printouts of the PDF sets that were electronically distributed earlier.

- 1.5.3.4 Presentation. The design team will present the Charrette Documents, including the alternative designs. The project delivery team selects the preferred site and building scheme to develop.
- a. Improved site layouts and floor plans. The Contractor's designers shall develop and refine the conceptual site and building design in their completion of the design and construction documents. Such development shall be consistent with the criteria and acceptable to the Government.
- 1.5.3.5 Design Iteration. After the initial session, the designers begin detailed work, walking the site, coordinating with local utility providers and regulatory agencies, and revising site and space layout schemes. Breakout sessions of all disciplines should occur.

Other members of the PDT remain available for consultation. When the designer is ready, the other participants reconvene to hear and discuss the design proposal, eliminate alternatives, and provide additional guidance. The group adjourns again, while the designer refines the design to incorporate the latest comments. This is an iterative process, which continues until the design is acceptable.

- 1.5.3.6 The end result of the charrette is an agreement on the following:
- a. The scheme reflecting the accepted changes to the proposed design, and to be developed.
 - b. Site Plan. Plan will show building footprints, AT/FP setbacks, POV parking, MEP, and access roads. Indicate the general location of new buildings, paved areas, structures, fences, ramps and curbs. On the property. Locate the building from a known point of reference. Indicate areas for parking privately owned vehicles (POV) and military equipment (MEP).
 - c. Space Layout. (Single line floor plans, provided for each building)
 - d. The color scheme and finishes
 - e. Wrap-up, including
 - 1) Design summary
 - 2) Schedule, including scheduling the revised charrette conference call.
 - 3) Action items
 - 4) The Contractor provides participants with outline meeting minutes and a list of participants.
 - f. Deliverables: The Contractor provides participants with outline meeting minutes, a list of participants, electronic copies of the draft design files (pdf format), and reproduced paper markups sufficient to define the results of the meeting.

1.5.4 Submittal Requirements.

- 1.5.4.1 Charrette meeting: The items listed above in paragraph just above beginning with words "The end result . . ."

- 1.5.4.2 Revised Charrette Document: The revised charrette document will be submitted to the Government in the time frame called for in the schedule. It consists of meeting minutes, updated narrative, and image files. Note that this is not an opportunity to revise functional space. Provide the following:
- a. Design Narrative; This narrative will contain meeting minutes that provide a thorough record of discussions, iterations, and decisions from the charrette design meeting. Describe the proposed architectural, civil, mechanical, structural and electrical design. List special equipment with unusually large electrical or cooling loads. Identify which options are used for major building systems. Identify elements outside of the norm such as deep foundations, environmental remediation, etc. Describe the interior design features and furnishings intent along with the proposed information systems. Provide information on any known utility conflicts or capacity upgrades that are required for the project. The drawings required below may be properly scaled to fit in the back of the design narrative as foldouts or provided separately.
 - b. Site Plan. As determined agreed and developed in the charrette meeting. Show handicapped parking and ramps as required. Indicate the dumpster location and screen walls as required. Show the work area limits.
 - c. Architectural Floor Plans. Complete the floor plans showing the correct room names and numbers, wall locations, toilet fixtures, lockers, folding partitions, storage cages, doors, and the common administration area workstations.

1.5.5 Review.

The submittal is sent to the charrette meeting participants to document agreements made at the charrette meeting. There is usually no review meeting; however a conference call is typical. The purpose of the conference call is to verify the submitted floor plan and other submitted documents are as agreed. Any new changes to the revised charrette documents must be approved by the Project Officer and will be incorporated in the interim design submittal.

1.6 INTERIM DESIGN SUBMITTAL

1.6.1 General.

Interim submittal is for technical review of the design. It is not a functional review. It includes:

- 1.6.1.1 Drawings depicting major components of the civil, architectural, interior design, structural, mechanical, electrical, fire protection, and information systems design as well as complete building elevations.
- 1.6.1.2 A Design Analysis that contains a narrative by each discipline, and preliminary calculations and product selections for each discipline. Include as appendix material minutes of prior meetings.
- 1.6.1.3 LEED spreadsheet.
- 1.6.1.4 A list of proposed project specifications. These will be included in the Design Analysis.

The design effort continues during the review process.

1.6.2 Submittal Requirements.

As listed above, plus see the discipline chapters for additional specific submittal requirements.

1.6.3 Checking.

All drawings and calculations are checked as required by the Design Quality Control Plan.

1.6.4 Review.

- 1.6.4.1 All review comments will be submitted in spreadsheet format or marked up drawings. The design team shall respond to the comments before the review meeting, and bring 15 copies of the latest comment report for distribution at the meeting. The A/E may elect to bring 6 copies of the comments for key players to the meeting, and use an overhead projector for viewing the comments with the entire team to reduce the number of printed copies.
- 1.6.4.2 There will be an interim design review meeting to discuss review comments and other issues. Bring sufficient personnel, including at a minimum the overall project manager, construction superintendent, lead architect, civil engineer, mechanical, electrical, and all other disciplines appropriate for the project's particular needs. It is anticipated that those comments not yet evaluated and those whose evaluation is not "concur" will be discussed at the review meeting. Comments with a "Concur" response that is acceptable to Government may not receive further discussion at the meeting.

1.7 FINAL DESIGN SUBMITTAL

1.7.1 General.

The final design submittal consists of a complete design required to build the project. It includes all completed drawings, fully edited specifications, and design analysis.

1.7.2 Comments.

Incorporate all approved interim submittal comments into the design.

1.7.3 Submittal Requirements.

(See also the discipline chapters for specific submittal requirements.)

1.7.3.1 Specifications.

- a. Provide complete project specifications covering all disciplines and aspects of the project.
- b. Required specifications origin and technical content shall be as called for in Section 01 02 00.00 48 – STATEMENT OF WORK, subparagraph "Specifications".
- c. Provide specifications in format as called for in Section 01 03 00.00 48 DESIGN SUBMISSIONS AFTER AWARD, paragraph "General Design Requirements", subparagraph "Specifications and reports."

1.7.3.2 Design Analysis

- a. Provide narrative that is an expansion and elaboration by each discipline from that provided at interim design.
- b. Provide design calculations and supporting documentation to support the major technical design considerations. Calculations shall be computed and checked by separate individuals, one of which must be a licensed professional in the associated discipline. Supporting documentation shall be clear, and formulas and references shall be identified. Assumptions and conclusions shall be explained and cross-referencing shall be clear. Provide as called for in the various discipline chapters.
- c. Checking.
 - 1) All drawings and calculations are checked as required by the Design Quality Control Plan
 - 2) All review comments will be submitted and evaluated in spreadsheet format.
- d. Cut sheets, product selections forming the basis of design: Clearly mark the

selected product type or model intended to apply to the project. If the cut sheets or brochures are standard printouts from manufacturer showing several variations, either mark/mark out to indicate just the selected product or accompany the cut sheet with a cover sheet showing the applicable product.

- e. Cut sheets provided at the design stages are intended only to show the basis of design, and are not shop drawings as called for in Section 01 33 00.10 06 SUBMITTAL PROCEDURES FOR DESIGN/BUILD.
 - f. Include as appended material all meeting minutes, and project-specific documentation such as asbestos and other hazmat reports.
- 1.7.3.3 Special Contract Requirements. Provide a special contract requirements section that is developed per scope of work requirements for the project.
 - 1.7.3.4 Submittal Register. Provide the completed submittal register (DA Form 4288).
 - 1.7.3.5 Engineering Considerations for Field Personnel. Provide in the design analysis a narration of unusual project conditions that need special attention by construction personnel.
 - 1.7.3.6 Form 1354. Provide draft DD Form 1354 (Transfer of Real Property). A sample form, and further information concerning the 1354 preparation may be found in SECTION 01 02 00.00 48 – STATEMENT OF WORK. See also <http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd1354.pdf>. More information on the 1354 form and associated government-provided form completion software may be found at <http://www.sam.usace.army.mil/en/cost/forms/DD-1354/1354inst.html>.

The 1354 form itemizes the types, quantities and costs of various equipment and systems that make up the project, for the purpose of transferring the new construction project to the Installation's inventory of real property. Contact the Real Property POC and obtain the specific category codes used to report key utilities for O&M funds, and align the 1354 document with the identical category codes

- a. Contractor provides draft Form 1354, and associated equipment lists, for Government approval, and assists Government in finalizing the Form.
- b. A draft DD 1354 is prepared by the Designer of Record, and submitted with the final design. The draft is updated per the final design comments and resubmitted with the certified final design. This document is used by the DEARNG construction personnel to approve the final DD 1354 upon completion of construction.

1.7.4 Review

- 1.7.4.1 All review comments will be submitted in spreadsheet or marked up drawing format. The design team shall respond to the comments before the review meeting, and bring 15 copies of the latest comment report for distribution at the meeting. The PE/A should direct the PDT to review the final submittal against their interim comments, and close those comments that have been addressed. Any comments still open or outstanding should be discussed at the final review meeting.
- 1.7.4.2 A final design review meeting is held at the project location per the date in the agreed project schedule, to discuss the review comments and other issues. Bring sufficient personnel, including at a minimum the overall project manager, construction superintendent, lead architect, mechanical, electrical, and all other disciplines appropriate for the project's particular needs.
- 1.7.4.3 At the Final review meeting, discuss review comments and other issues. It is anticipated that those comments that have not evaluated and those whose evaluation

is not “concur” will be discussed at the review meeting. Comments with a "Concur" response that is acceptable to Government may not receive further discussion at the meeting. Interim comments that have not been closed or are still outstanding should also be reviewed at the meeting for closure.

1.8 CORRECTED FINAL DESIGN SUBMITTAL

1.8.1 Comments incorporation.

Corrected final design will incorporate all approved final submittal review comments into the design and other issues arising at the final review meeting and as agreed.

- 1.8.1.1 Contractor shall provide response to all comments, with further response as needed to satisfy backcheck follow-up by the government. Upon satisfactory comment resolution as described above, the government may then close all comments.
- 1.8.1.2 Provide one or more red-lined markup sets of the Plans and Specifications (and Design Analysis if required) indicating the disposition of each Comment. Size shall be 11x17. Red-lined marked up sets shall be marked with a wide red marker or CADD font, circling the change and marking it with the Commenter's name and the comment number. It is intended for two sets to be sent to the DEARNG.
- 1.8.1.3 Provide corrected Design Analysis incorporating final review comments. Unless otherwise noted, electronic copy only is preferred.
- 1.8.1.4 Any further corrections made to the corrected final shall be sent to the PE/A and reviewer directly via email or fax, or with a PDF file attached to the Dr. Checks comment, so the outstanding comment can be closed.

1.9 CERTIFIED FINAL DESIGN SUBMITTAL

The certified final design is when ALL review comments have been addressed, incorporated into the design, and the final design has been approved, and ready for construction. It shall include full size stamped and signed set of drawings with signatures on each sheet and professional stamps from each Designer of Record.

At completion of this process the Contractor shall provide CD(s) containing:

- Native format project files -- drawings and specification
- Contract document files formatted for general use with respect to the project -- drawings, specifications, and design analysis converted to PDF files. Each shall be contained in a separate file folder. The specifications shall be formatted into one large PDF document, bookmarked appropriately. Design analysis shall be similarly formatted.

1.10 RENDERINGS

If renderings are required per the Statement of Work, then designer shall submit one or more samples of renderings (which can be from another project), showing the quality and style of the proposed final rendering.

Once the ACSIM officer approves the submitted style, designer shall develop three sample draft sketches for the project. Submit the three sketches electronically in PDF format to the government PE/A, who will distribute to the PM and Project Officer. These will be used by the ACSIM Project Officer to determine the best view/angle for the particular project. Designers shall wait until a selection and approval is given by the PE/A before further developing the selected sketch into the final rendering. Reproduce the rendering according to the Statement of Work.

Renderings shall have the facility/complex as the main focal point. The project name from the DD1391 form is usually centered as a title, with the project location. It is acceptable for the design firm to include its name and logo on the rendering.

Chapter 2.0 – CIVIL

2.1 GENERAL

This chapter provides guidance for preparation and development for each of the different required submittal stages.

2.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below lists additional requirements specific to this discipline.

2.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

2.2 CHARRETTE DESIGN

2.2.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above, paragraph: Charrette Design Meeting And Submittal. See also Chapter 3.0 – Site Mechanical Utilities.

2.3 INTERIM DESIGN

2.3.1 Survey and Geotechnical data

2.3.1.1 Submit contractor provided survey and geotechnical data as called for in 01 02 00.01 48 STATEMENT OF WORK, subparagraph "Survey And Geotechnical Information."

2.3.1.2 Once the proposed building(s) and parking location is finalized after the charrette meeting, perform a complete geotechnical investigation. Provide boring logs and locations in the required CADD format.

2.3.2 Design Analysis.

2.3.2.1 Site Design. Provide a complete explanation of the site design. Describe any required site demolition and landscaping. Provide a section on the utility design. Describe the setbacks and separations of parking and buildings required by UFC 4-010-01 DoD Minimum Antiterrorism Standards.

2.3.2.2 Geotechnical Report. Provide a complete geotechnical report with the interim design.

2.3.3 Drawings.

2.3.3.1 Demolition Plan. Complete the demolition plan.

2.3.3.2 Site Plans. Complete the site plan. Show individual parking spaces and facility signs. Dimension all significant features of the site plan. Identify the work limits for the project with coordinates including the area used by the Contractor for material staging.

- 2.3.3.3 Grading and Drainage Plan. Provide proposed contours and drainage structure locations superimposed on the proposed new site plan with the existing contours in the background. (Grading plan may be incomplete at interim review.) Connecting pipes may be omitted depending on drawing complexity and clarity. Label structure types. Indicate the new building(s), pavement, drainage inlets, structures, swales and/or detention areas along with the existing and proposed new piping. Indicate existing contours with a light line proposed new contours with a darker line. Locate spot elevations as required to describe the design intent.
- 2.3.3.4 Storm and Sanitary Site Plan. Provide storm and sanitary sewer layouts superimposed on the proposed site plan. Label sewer structures. Pipe sizes and elevations may be estimated.
- 2.3.3.5 Utility Plans. Initiate the creation of the overall utility plan for other disciplines and coordinate this with other disciplines. Create utility plans for the sanitary sewer and create enlarged plans as required.
- a. Facilities not in a military installation require coordination with the local utility and typically involve separate submittals and permits.
 - b. Facilities in military installations that have some or all utilities privatized typically involve separate submittals and compliance with the standards of that utility.
 - c. This sheet shall show the building and pavement locations with the connection of new utilities from the building to the existing utilities. Indicate the pipe sizes and/or capacities for electricity, gas, water and sewer. Indicate the adequacy of the water system for providing water for fire protection, including flow test data if available. Also indicate the above ground utility structures such as power poles and fire hydrants. Show estimated size for new project demand.
- 2.3.3.6 Road and Parking Area Profiles. Provide profiles of proposed roadway and parking lot facilities. Label vertical alignment, proposed profile grade, existing ground and utility crossings.
- 2.3.3.7 Typical Sections: Provide typical roadway and parking lot sections.
- 2.3.3.8 Boring Locations and Logs: Provide a drawing showing the location of the borings taken in the geotechnical investigation. Also provide boring logs that show graphically the types of soils encountered in the geotechnical investigation. Coordinate these sheets with the geotechnical engineer.
- 2.3.3.9 Right of Way Plans: If the project is located adjacent to private property, provide a separate “Right of Way” plan as required. Provide reference drawings showing all land required for construction of the project.
- 2.3.3.10 Other plans and information that may be useful: Survey Control/Reference Point Drawings, Aerial Photographs; Site Photos; Site Location Drawings.-

2.3.4 Specifications.

Provide a listing of specifications in the design analysis.

2.4 FINAL DESIGN

2.4.1 DESIGN ANALYSIS.

- 2.4.1.1 Site Design. Describe the complete site design including decisions made on the project. Provide information regarding site demolition and landscaping. Provide a section on the utility design.
- 2.4.1.2 Geotechnical Report. Provide the geotechnical report.

2.4.2 Drawings.

Complete all the drawings required at the interim design review stage and incorporated approved comments. Add the drawings detailed below.

- 2.4.2.1 Sanitary Sewer Profiles. Provide profile sections of the sanitary sewer system showing the manhole locations, pipe sizes and grades and other utility crossings.
- 2.4.2.2 Storm Sewer Profiles. Provide pipe profiles of the storm system when necessary showing manhole locations, pipe sizes and grades and other utility crossings.
- 2.4.2.3 Erosion Control Plan. Provide an erosion control plan with details that show the critical areas that are being protected while the project is under construction. Coordinate the details of this sheet with state and local authorities as required. Obtain the necessary permits such as NPDES, 401 and/or 404 and develop the Pollution Prevention Plan associated with NPDES.
 - a. Coordinate the NPDES permit associated with construction activities, including obtaining forms and supporting data. Obtain the permit and abide by the terms of the permit.
 - b. The permit usually requires the signature of the "owner" of the facility and will require coordination with the local installation.
- 2.4.2.4 Details. Provide complete details of pavement joints, concrete, fences, manholes, catch basins, other site structures and any other details necessary to show all aspects of the design.
- 2.4.2.5 Exterior Facility Signage. Provide location of facility signage with complete design and installation details. This signage may be shown on the Site or Landscape drawings. A note referencing the signage schedule and any other facility signage information found in the architectural drawings will be included.

2.4.3 Specifications.

Provide a complete set of fully edited specifications from the listing given at the interim design.

Chapter 3.0 – SITE MECHANICAL UTILITIES

3.1 GENERAL

This chapter provides guidance for preparation and development for each of the different required submittal stages. Electrical utilities are found in the electrical chapter. Storm and other civil utilities are found in the civil chapter.

3.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below list additional requirements specific to this discipline.

3.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

3.2 CHARRETTE DESIGN

3.2.1 Site Utility Narrative

Provide information concerning sources and availability of gas, water, and fire utilities, and what is intended for the project.

Include a discussion of special plumbing and fire protection needs and requirements. Discuss upgrade issues when systems require larger capacities.

Discuss who owns the various utility systems, and what is involved in obtaining services.

3.3 INTERIM DESIGN

3.3.1 Design Analysis.

The charrette narrative forms the basis of the future design analysis. Depending on submittal requirements, include the following in narrative form:

- 3.3.1.1 List of Criteria. - design criteria, Codes and manuals used to create the design - design technical instructions or manuals, pamphlets, technical references, and other design guidance or criteria used in the design and their updates.
- 3.3.1.2 Known Utilities. Identify known Utilities, energy sources, locations, who manages/owns them, metering requirements, backflow prevention requirements, and alternatives.
- 3.3.1.3 Utility Alternatives. Provide life cycle cost analyses, as necessary or required, include narrative describing alternatives compared, reasons for choices selected, and calculations.
- 3.3.1.4 Fire Protection. Provide site fire protection system requirements.
- 3.3.1.5 Other Requirements. Provide a list of items for which additional criteria, clarification, or guidance is required.

3.3.2 Drawings.

Provide plan views showing the features listed. Verify plan views of all utilities are coordinated with all other disciplines and properly interface with applicable building plans. Indicate locations and sizes of existing outside water and fire service lines, natural gas lines, and other utilities where required to support the project. Indicate fire department connection location for each building.

Show same scale as other site work drawings. Indicate proposed routing of new lines.

3.3.3 Specifications.

Provide a listing of specifications in the design analysis.

3.4 FINAL DESIGN

3.4.1 Design Analysis.

3.4.1.1 The final design analysis is a refinement of the prior design analysis and contains all the information called for in those sections of this chapter.

3.4.1.2 Show applicable references for design assumptions.

3.4.2 Drawings.

3.4.2.1 Final plans are complete, solicitation ready, drawings with all necessary details, layout drawings, section views, plan views, and schedules.

3.4.2.2 Provide sections, elevations and details of sufficient scale to allow construction and installation of the work without additional design work by the construction contractor.

3.4.3 Specifications.

Provide a complete set of fully edited specifications from the listing given at the interim design.

Chapter 4.0 – ARCHITECTURAL

4.1 GENERAL.

This chapter provides guidance for preparation and development for each of the different required submittal stages.

4.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below list additional requirements specific to this discipline.

4.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

4.2 CHARRETTE DESIGN

4.2.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above, paragraph: Charrette Design Meeting And Submittal.

4.3 INTERIM DESIGN

4.3.1 Design Analysis.

Update the Charrette design narrative to include description of all design revisions and/or developments. Provide interim DA as a new document, not as addenda to the Charrette document.

4.3.1.1 State the purpose, function, and capacities in sufficient detail to delineate and characterize functional features and the desired image or visual appearance of this project.

4.3.1.2 Describe the architecture of the existing facilities near the site and how the project relates to these facilities.

4.3.1.3 Include a Fire Protection/Life Safety Code submittal with signatures. This is an attachment to the Statement of Work.

4.3.1.4 Provide a brief statement of the interior and exterior finish materials to be used in the project. Include an interior design statement that indicates the coordination of the structural finishes and features with the selected furnishings' function, styling, detailing and finishes.

4.3.1.5 If the project has a kitchen, include kitchen equipment cut sheets (model number specific manufacturers' product literature).

4.3.2 Drawings.

Provide drawings in sufficient detail and annotated for the local user to visualize precisely how the architect has interpreted the using activity's functional and operational requirements. Provide as a minimum the following drawings:

- 4.3.2.1 Composite Floor Plan. If the main floor plans must be shown in segments in order to comply with the requirements of the proper scale, provide a smaller scale floor plan showing exterior wall, interior partitions, circulation elements, and cross referencing for enlarged floor plans and sections. Show overall dimensions on the floor plan and gross building areas tabulation on the drawing.
- 4.3.2.2 Floor Plans. Provide floor plans at $1/8"=1'-0"$ or $1/4" = 1'-0"$ (1:100 or 1:50) scale. Show gross floor area tabulations if no composite sheet is included.
- a. Building Entrances. Show all stoops, steps, or similar access features pertaining to the building entrance, that will normally be built by the building construction contractor as differentiated from sidewalks, driveways, etc., which are normally constructed by a sitework contractor; on the architectural drawings.
 - b. Roof and Wall Insulation. Indicate roof and wall insulation at a nominal thickness consistent with the insulation requirements of the particular building or project. The insulation thickness and R-value should be indicated on the drawing.
 - c. Floor Drains and Slopes. Show floor drains and shower heads on the architectural drawings as well as on the plumbing drawings and closely coordinate with other disciplines. All floors in areas requiring drains are to slope toward the drains. Coordinate floor drain locations with structural elements.
- 4.3.2.3 Building Elevations. Provide building elevations showing grading, openings, principal exterior materials and general profiles of the building (scale shall be the same as the floor plans).
- 4.3.2.4 Roof Plan. Provide a roof plan showing the roof configuration and methods by which rain is directed to the building perimeter.
- 4.3.2.5 Wall Sections. Provide typical wall sections ($1/2" = 1'-0"$, or 1:20 minimum scale) that indicate major elements. Wall sections shall be unbroken where practical and indicate materials and floor-to-floor heights.
- 4.3.2.6 Provide drawings for: enlarged plans (stairs, lobby, misc. plans), significant project details (roof, & elevator) wall types, door and window details, bathroom plans and details, vault plan and details (coordinated with structural).
- 4.3.2.7 Schedules. Provide a door schedule and room finish schedules indicating the materials and finishes used in the design. Also a special item schedule and/or notes shall be provided indicating any special items that will be required for the design.
- 4.3.2.8 Reflected Ceiling Plan. Provide a ceiling plan that indicates ceiling material and open ceiling areas. Indicate room numbers, light locations, registers, and all ceiling mounted items such as exit signs.
- 4.3.2.9 Fire Protection/Life Safety Plan. Provide fire protection/life safety drawings that indicate fire suppression information, exit signs, pull stations, exit devices, exit distance, emergency lights, detectors, alarm locations and fire panel locations. Summarize the code information from the design analysis on the drawings.

4.3.3 Specifications.

Provide in the design analysis a listing of specifications planned to be used.

4.4 FINAL DESIGN

4.4.1 Design Analysis.

Update the Final design analysis from the interim design to include descriptions of all design revisions and/or developments. Provide final DA as a new document, not as addenda to the Interim document. Include the updated Fire Protection/Life Safety Code submittal with signatures.

4.4.2 Drawings.

Complete the final drawings to present a complete description of all the construction required and fully coordinate with other disciplines.

- Provide an interior and exterior signage plan, schedules and details indicating the color, location and types of signs used on the project.
- Landscape Plan. Projects will include a landscape plan where required by the project scope. Typically, if the landscape is extensive, the plan is prepared by a registered landscape architect.

4.4.3 Specifications.

Provide a complete set of fully edited specifications from the listing given at the interim design.

Chapter 5.0 – INTERIOR DESIGN

5.1 GENERAL.

This chapter provides guidance for preparation and development for each of the different required submittal stages.

5.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below list additional requirements specific to this discipline.

5.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

5.1.3 Interior Submittals Overview

Below is a description of the overall package -- the CID and its subparts the FF&E and the SID -- that form the Interiors Submittals.

5.1.3.1 Comprehensive Interior Design (CID). A Comprehensive Interior Design (CID) package in the contract for all Army projects includes the Furniture, Fixtures and Equipment (FF&E) design and the Structural Interior Design (SID). The two types of services cover different aspects of the interior environment. The FF&E includes selecting and developing interior building furnishings for an integrated visual design theme, which reflects the interior atmosphere desired by the customer. The Structural Interior Design (SID) includes exterior finishes, interior finishes, and special item selections; and is included as a separate binder submittal. The CID package is developed concurrently with the design of the facility and submitted for review per the following:

- The complete FF&E submittal includes:
 - a. FF&E Binder Index
 - b. Statement of Design Objective
 - c. Furniture Room Layouts
 - d. Room Contents List
 - e. Item Installation List
 - f. Specification List by Tag
 - g. Manufacturer POC List
 - h. Furniture Illustration Sheets
 - i. Furniture Procurement Sheets
 - j. Presentation Color Boards
 - k. Site Plan
 - l. Architectural Floor Plans.
 - m. Electrical/Data/Communications Plans
 - n. Composite Furniture Floor Plans
 - o. Enlarged Furniture Floor Plans
 - p. Furniture Key Code Plan

q. Enlarged Furniture Typical Details

- The complete SID submittal includes:
 - r. SID Binder Index
 - s. Statement of Design Objective
 - t. Selection and sampling of all applied finishes including material, color, texture and patterns necessary to complete the exterior and interior finishes and special items.

- 5.1.3.2 Furniture, Fixtures and Equipment (FF&E). Furniture, Fixtures and Equipment (FF&E) includes selecting and developing interior building furnishings for an integrated visual design theme which reflects the interior atmosphere desired by the Army National Guard. This information shall be submitted in 3” D-ring binder(s), 8-1/2” x 11” format with only one foldout per page. The maximum foldout width shall be approximately 25”. Each binder shall be labeled on the outside spine and front cover with the following information: Project title and number, date, project location, design firm and type of submittal (Interim, Final, etc.). Material and finish samples shall indicate true pattern, color and texture, labeled with manufacturer, name, model number, and finish schedule tag reference. Each sample board is to be inserted into a clear, heavy-duty page protector that is sturdy enough to keep the pages from tearing out. With each new submittal the Interior Designer of Record shall create new FF&E binder(s) to satisfy review comments until the Government approves the completed CID package. At the time of the furniture procurement (approximately six months prior to the Furniture BOD), the Interior Designer of Record is required to update the FF&E to correct any deficiencies, errors, or furniture product updates after the technical furniture review prior to the actual procurement of the furniture.
- 5.1.3.3 Structural Interior Design (SID). The Structural Interior Design (SID) includes the selection and sampling of all applied finishes including material, color, texture and patterns necessary to complete the building’s interior architectural features. Items include, but are not limited to: wall and floor finish materials, window and door finishes, glazing and trim materials, ceiling materials and finishes, millwork materials and finishes, paint and stain finishes, as well as specialty items. Since exterior colors, materials and finishes influence interior selections, include exterior materials as a separate section of the SID. Items include, but are not limited to, roofing materials and finishes, gutter and downspout, soffit and fascia panels, brick and mortar, window and door frames, as well as specialty items. This information shall be submitted in 3” D-ring binder(s), 8-1/2” x 11” format with only one foldout per page. The maximum foldout width shall be approximately 25”. Each binder shall be labeled on the outside spine and front cover with the following information: Project title and number, date, project location, design firm and type of submittal (Interim, Final, etc.). Material and finish samples shall indicate true pattern, color and texture, labeled with manufacturer, name, model number, and finish schedule tag reference. Each sample board is to be inserted into a clear, heavy-duty page protector that is sturdy enough to keep the pages from tearing out. With each new submittal the Interior Designer of Record shall create new SID binder(s) to satisfy review comments until the Government approves the completed SID package.

5.2 CHARRETTE DESIGN

The charrette submittal shall include

- A narrative description of the interior design features and furnishings intent.
- The color scheme as discussed at the charrette meeting.

5.3 INTERIM DESIGN

The interim submittal shall include the design analysis, construction drawings and CID package consisting of the FF&E and SID material and finish samples.

5.3.1 Design Analysis.

- 5.3.1.1 Statement of Design Objective. Provide a narrative explaining the interior design concept of the facility. Where applicable, include desired psychological impact of the interior environment on its inhabitants and proposed method of accomplishing same by using space planning, shapes, forms, color, patterns, textures, fabrics and furnishings. Explanations of unusual conditions shall be included, such as the coordination of special laminates and fabrics between various product lines and manufacturers to provide a consistent overall environment.
- 5.3.1.2 Typical Furniture Layouts. Provide the “basic” typical room furniture layouts and typical workstations used in the project. It is not expected that every typical, every atypical and every workstation will be known at this stage of the design. The typicals included are to be representative only. Include the furniture “tags” in these typicals and the general project information. Drawings must be legible with a minimum drawing scale of 1/4" = 1' - 0". The typicals will include basic information on where they are used, such as “Full Time Private Offices”, “Unit Exclusive Shared Offices”, etc. They may also include the room numbers where the typicals are to be used. These tagged typicals may also be shown on the construction drawings as described in the final submittal paragraph.
- 5.3.1.3 Room Contents List. This report shall provide the furnishings specified for each room by furniture tag, description, manufacturer, model number and quantity. List all desk units and panel systems workstations by a group furniture tag. Desk units consist of the desk, credenza, bridge, overhead, etc. and are tagged as one unit. The report is to be sorted by building, floor, room and tag in alpha/numeric order and shall be submitted in electronic format.
- 5.3.1.4 Specification Listing. Provide a listing of specifications in the design analysis.

5.3.2 Drawings.

- 5.3.2.1 Furniture Floor Plans. Provide as part of the construction drawings, furniture floor plans showing the furnishings required for the various functions that are to be housed in the facility, indicating the adequacy of the size and shape of each space and the spatial relationship between the furnishings and doors, windows, light switches,

thermostats, electrical/communication connections/outlets, bulletin boards, projection screens and other building features. Basic furniture plans shall be provided as a minimum with any additional furnishings items known at this stage of design included. Any areas that may pose “furniture fit” or other problems should be highlighted or annotated by notes on the furniture drawings to ensure that they are addressed at the interim review meeting. Drawings shall include Composite Furniture Floor Plans, Systems Furniture Plans, and Systems Furniture Panel Plans (if systems furniture is included in the project). Other plans shall be provided as the project requires i.e., Systems Furniture Component Plans for complex panel systems projects. Furniture Floor Plans shall include the room names and numbers. If the furnishings and room names and numbers overlap each other on the drawings, the room names and numbers should be relocated to provide legible information. Where furnishings are to be “Government Furnished, Government Installed” (GFGI), include a statement to the furniture drawings indicating that the furniture drawings are for information only, are to be used to coordinate furnishings locations with other disciplines, and that the furnishings are not part of the construction contract.

- 5.3.2.2 Additional Plans, Enlarged Plans, Elevations and Details. Provide as necessary any plans, enlarged plans, elevations and details indicating location and identification of accent walls, graphics, wall hangings, wall patterns/finishes, floor patterns/finishes, wall and corner protection and special items known at this stage of design.
- 5.3.2.3 Exterior and Interior Color, and Special Item Schedules. Provide an Exterior Color Schedule, an Interior Color Schedule, a Special Item Schedule (or notes) for those items known at this stage of design. These finishes include, but are not limited to, exterior and interior wall finish materials, window and door frames, doors, glazing, roofing materials, trim materials, floor and ceiling finishes, signage colors and styles, casegoods, toilet partitions, lockers and other visible materials affecting visual design aesthetics. Include a general non-proprietary disclaimer to indicate that naming the commercial product does not restrict the construction contractor to the particular product identified. (Example: “Manufacturers referenced are intended to establish color and finish only, and are not intended to limit selections from other manufacturers. When alternate selections are submitted, submittal shall include materials listed for comparison.”) Each finish/item selected must be available from at least three manufacturers. (Exceptions to this must be discussed with the DE Army National Guard on a case by case basis with detailed explanations provided.)

5.3.3 FF&E and SID.

Finish Samples and Furnishing Illustrations. The finish samples for the FF&E and SID may be presented loose at the interim review meeting or mounted on color boards as part of the FF&E and SID binder(s). If presented loose, each sample shall be labeled with the following information: manufacturer, finish model number and/or color number, where the finish is used, fabric content, finish schedule tag reference and any other pertinent information. If mounted on color boards as part of the FF&E and SID binder(s), a Finish/Special Item Key shall be included indicating the following information: manufacturer, finish model number and/or color number, where the finish is used, fabric content, finish schedule tag reference and any other pertinent information. Illustrations of the major furnishing products or product lines may be presented at the interim review meeting using manufacturers’ product catalogs and pamphlets or included in the FF&E binder.

5.3.4 Specifications.

Provide a listing of specifications in the design analysis.

5.4 FINAL DESIGN

5.4.1 Design Analysis.

The submittal shall have the interim submittal design analysis updated to include all design revisions and/or developments.

5.4.2 Drawings.

Update and complete all information provided in previous submittals and approved review comments.

- 5.4.2.1 Furniture Floor Plans. Provide as part of the construction drawings Composite Furniture Floor Plans, Systems Furniture Plans, Systems Furniture Panel Plans and Enlarged Furniture Floor Plans. Other plans shall be provided as the project requires i.e., Systems Furniture Component Plans for complex panel systems projects. Plans shall reflect added or changed items since the previous submittal. Furniture Floor Plans will consist of the following:
- a. Composite Furniture Floor Plans. For large facilities include room names and numbers but do not include furniture tags. Include a building footprint key plan in the lower right hand corner of the sheet indicating how the floor plan has been divided between the larger scaled sheets. For smaller facilities where the architectural floor plan does not require multiple plan drawings, the Composite Furniture Floor Plan shall include room names and numbers, and furniture tags but does not require a building footprint key since the facility is not split between two or more sheets. All furniture plans are to be labeled REFERENCE ONLY or NOT IN CONTRACT (NIC).
 - b. Enlarged Furniture Floor Plans and Enlarged Furniture Typical Details are to include all furniture, desk unit and panel systems workstation/panel tags, furniture legend representing the furniture tag with description, and building key plan in the lower right hand corner of the sheet indicating how the floor plan has been divided between the larger scaled sheets.
 - 1) Systems Furniture Panel Plan(s) are to include dimensions for placement within a room for accurate installation of the panel systems furniture and all walls, doors and window locations. Drawing scale must be large enough scale so that the furniture "footprints" are clearly discernible and data is legible.
 - 2) Furniture tags --Every furniture item, desk unit and panel systems furniture workstation is to be tagged individually with alpha/numeric tags. The desk unit, consisting of the main desk components; i.e. desk, credenza, bridge, overheads, keyboard, etc. will be tagged as one unit D1, D2, D3, etc. All panel systems furniture workstations will be tagged as WS1, WS2, WS3, etc. with the panel systems pods only tagged as a P1, P2, P3, etc.
 - 3) Include enlarged views of each metal desk-based unit typical and each panel systems furniture workstation typical indicating all components.
 - 4) The enlarged Furniture Panel Systems only plan should be tagged listing all panels with sizes, powered and non-powered, power end feed locations, and duplex/data locations.

- 5) All furniture plans are to be labeled REFERENCE ONLY or NOT IN CONTRACT (NIC).
 - c. Structural related built in equipment (such as marker boards, projection screen and map rails) or cabinets (items to be provided with the construction contract) shall be shown and identified on the furniture plans as well as on the architectural plans, and on any enlarged plans of those areas where such items are placed in the facility. These items shall be shown and identified by name and/or SID finish or Special Item code.
- 5.4.2.2 Additional Plans, Enlarged Plans, Elevations and Details. Provide as necessary any plans, enlarged plans, elevations and details indicating location and identification of accent walls, graphics, wall patterns/finishes, floor patterns/finishes, wall and corner protection and special feature items.
- 5.4.2.3 Electrical/Data/Communication Plans. Provide as necessary electrical/data floor box and wall power feed locations with dimensions to coordinate with the panel systems furniture layouts for all areas that are to receive floor box and wall locations.

5.4.3 Specifications.

Provide all specifications, fully edited, necessary to accurately and completely describe/identify the complete project.

5.4.4 FF&E and SID Binders.

Separate FF&E and SID binders are included at final design to illustrate the designer's intended interior and exterior color schemes, material finishes, colors for the furnishings, and detailed furnishing layouts. The FF&E contains the furnishings procurement and installation information needed to purchase and install the furnishings that are usually procured under a separate contract and are provided with the construction documents for information only. Furnishings presentation color boards are also included in the FF&E binder. The presentation color boards and Finish/Special Item Key for the structural finishes are included in the SID binder. Maximum binder thickness shall be four inches. Binders shall indicate project information on the cover and on the spine for easy identification. (See General Interior Design paragraph.) The FF&E and SID binders shall include the following as a minimum.

- 5.4.4.1 FF&E Binder with Presentation Color Boards. Provide the following in the FF&E binder:
 - a. Index. Provide an index for the FF&E binder.
 - b. Statement of Design Objective. Provide the narrative included in the design analysis explaining the interior design concept of the facility. Edit/expand the previous submittal narrative as needed to convey the design intent as it relates to FF&E and the structural finishes.
 - c. Furniture Room Layouts. Provide individual room floor plans representing the furniture layouts for all rooms that are to receive furniture. Include the furniture "tags" with descriptions on these sheets and include all architectural elements located within the room. Drawings must be legible with a minimum drawing scale of 1/4" = 1' - 0". Indicate room name and number, and the general project information on each sheet. Like room layouts may be listed on one individual room sheet with all rooms to receive the same furniture layout listed. Include one copy of the furniture legend in the section with the room layouts.
 - d. Room Contents List. This document shall provide the furnishings specified for each room by furniture tag, description, manufacturer, model number and

- quantity. List all desk units and panel systems furniture pods by a group furniture tag. Do not list individual components and panel systems furniture parts required to build the units. The report is to be sorted by building, floor, room and tag in alpha/numeric order and shall be submitted in hard copy & electronic format.
- e. Item Installation List. This document provides the location by room for each item included in the furniture package. List all desk units and panel systems furniture pods by a group furniture tag. Do not list individual components and panel systems furniture parts required to build the units. The report is to be sorted by furniture tag, description, manufacturer, model number, room number and quantity listed in alpha/numeric order by the furniture tag and shall be submitted in hard copy and electronic format.
 - f. Specification List by Tag. This document is to define the furniture requirements for the project. It shall list all pertinent information for each furniture item specified in the furniture package including the tag, description, manufacturer, model number, size, finishes and total quantity per installation phase, floor, and building. The report is to be sorted by manufacturer, phase, floor, building and furniture tag listed in alpha/numeric order by the manufacturer first and furniture tag second, and shall be submitted in hard copy and electronic format.
 - g. Manufacturer POC List. This document is to list the furniture manufacturers specified for the project with address, telephone, fax, and e-mail address: Contact's name, address, telephone, fax, and e-mail address. POC List shall be submitted in hard copy and electronic format.
 - h. Furniture Illustration Sheets. Provide furniture illustration sheets for all products specified in the furniture package. Illustrations are to be represented by black and white or color photographs. Information on the furniture illustration sheets shall include furniture tag, description, model number, finishes, size and manufacturer. A product photo or brochure of the desk units and panel systems workstations may be included or .jpg or .bmp file format photos may be used. It is not necessary to include individual photos of the parts and pieces that make up the desk units and panel systems furniture workstations. The Furniture Illustration Sheets shall be submitted in hard copy and electronic format.
 - i. Furniture Procurement Sheets. Provide an individual furniture procurement sheet for each manufacturer specified in the furniture package. Information on these sheets shall include manufacturer's name, address, telephone, fax and e-mail address; Contractor's name, address, telephone, fax and email address; Contact's name address, telephone, fax and e-mail address. List GSA Contract number and contract expiration date if applicable. List Open Market if product is not on a GSA Contract. The Furniture Procurement Sheets shall be submitted in hard copy and electronic format.
 - j. Presentation Color Boards. Provide presentation color boards in an 8 ½" x 11" binder format. The presentation color boards shall depict all materials and finishes for each proposed furniture item. Label the material and finish sample with specific color names with references to the specified furniture tag. The material and color samples provided must be large enough to indicate true

patterns, colors and textures. Each sample board is to be inserted into a heavy-duty clear page protector that is sturdy enough to keep the pages from tearing out. COLORED COPIES OF FINISHES ARE NOT ACCEPTABLE.

- k. Drawing Set Plans. Provide full-size plots with the FF&E binder of the following:
- 1) Site Plan – A Site plan and vicinity map shall be provided showing the location of the building or buildings in which the subject furniture is to be installed and site conditions/restrictions as provided in the construction contract.
 - 2) Architectural Floor Plans – Architectural floor plans shall be provided showing relationships and dimensions of all areas receiving furniture. Include the locations of any special items i.e., trophy cases, projection screens, marker boards, building directories and map rails as provided in the construction contract.
 - 3) Electrical/Data/Communications Plans – Plans shall be provided showing electrical receptacles, power feeds, switches, thermostats, fire alarm annunciators, telephone, and computer locations for areas receiving furniture. Place all dimensions for floor boxes on the electrical/data/communications plans as provided in the construction contract. This would include all floor junction boxes for panel power feeds and any floor boxes located in classrooms, conference rooms, training center rooms, etc.
 - 4) Composite Furniture Floor Plans – Include composite furniture floor plans as described in paragraph "Drawings" above.
 - 5) Enlarged Furniture Floor Plans – Include enlarged furniture floor plans as described in paragraph "Drawings" above.
 - 6) Enlarged Furniture Typical Details – Include enlarged furniture typical plans described in paragraph "Drawings" above.
 - 7) Furniture Key Code Plan – Provide a key code plan per manufacturer's key code requirements listing all furniture to be keyed alike and random.

5.4.4.2 SID Binder with Presentation Color Boards. Provide the following in the SID binder:

- a. Index. Provide an index for the SID binder
- b. Statement of Design Objectives. Provide the narrative included in the design analysis explaining the interior design concept of the facility. Edit/expand the previous narrative submittal as needed to convey the design intent as it relates to the structural finishes.
- c. SID Presentation Color Boards. Provide in the SID binder presentation color boards. Code and coordinate samples with the exterior finish, interior finish and special items schedules in the project contract documents. Provide a Finish/Special Item Key or legend that includes what each sample is used for, the manufacturer, style name and/or number, pattern name and/or number, color name and/or number, finish schedule tag reference, and any remarks or notes needed to describe what the boards are illustrating. Samples shall be large enough to show full patterns, colors, and textures. Securely mount samples to the presentation boards to withstand long periods of use. PHOTOGRAPHS OR COLOR XEROX COPIES OF FINISHES, MATERIALS AND COLORS ARE NOT ACCEPTABLE. Materials and finish shall be mounted on presentation boards in an 8 ½" x 11" binder format and inserted into a clear, heavy-duty page protector that is sturdy enough to keep the pages from tearing out of the binder.

Chapter 6.0 – STRUCTURAL

6.1 GENERAL.

This chapter provides guidance for preparation and development for each of the different required submittal stages.

6.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below list additional requirements specific to this discipline.

6.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

6.2 CHARRETTE DESIGN

No structural submittal requirements. However, the structural engineer must have strong input in the creation of the column and roof plan, which is carried out by the architectural discipline. The reason for this input is so the structural engineer insures that the column grid lines and/or bearing wall locations are such that an adequate framing plan can be achieved.

6.3 INTERIM DESIGN

The structural portion of the interim design submittal must outline for approval the proposed methods and materials of design and construction. Include the following:

6.3.1 Design Analysis.

- 6.3.1.1 General. Provide a general description of the scope of the project and all the major structures. Give overall building dimension and a description of the principal features such as wall and roof construction. If the building is irregularly shaped, explain where seismic joints will be placed to create regular shapes or provide a statement that dynamic analysis of the building will be performed (Note: Seismic joints are preferred in areas of high seismic activity for all structures of an irregular shape. For buildings in areas of low seismic activity, building joints are recommended only as needed for expansion and contraction purposes.)
- 6.3.1.2 Criteria. Include a listing of the required technical manuals, building codes and specifications in the design analysis.
- 6.3.1.3 Framing System.
 - a. Provide a brief structural narrative on the gravity load resisting framing system chosen and the reasons why.
 - b. Provide a brief narrative on the lateral load resisting system and how these loads will be transmitted to the foundations.
- 6.3.1.4 Foundation. Give a brief description of the anticipated foundation type/system based on the geotechnical report. Reference the geotechnical report to state the allowable soil bearing capacity, modulus of subgrade reaction, minimum footing sizes, and

minimum frost depth requirements. The designer may also refer to similar construction in the area if it is known and if it adds value to the submittal.

- 6.3.1.5 Special. List special/unique design features.
- 6.3.1.6 Information Needed to Complete the Design. List any unknowns that the designer needs to complete the design. For instance, the designer may request from the user a list of the military vehicles and their weights for the purpose of designing slabs.
- 6.3.1.7 Calculations. The following specific items shall be included to the extent they are complete:
 - a. Load Assumptions. State the dead and live loads to be designed for, including roof and floor loads. Calculate the wind loads, snow loads, lateral earth pressure loads, and seismic loads.
 - b. Calculate both positive and negative wind pressure with the controlling pressures summarized in tabular form. Include the following wind pressures as a minimum: wind on frame, wall, wall corners, roof, roof ridges, eaves, and roof corners.
 - c. Calculate the basic seismic loading for the frame or lateral load resisting system and contrast them with the comparable wind loads. Note the controlling design loads. Detailed calculations for seismic loads on parts and portions are not required at this submittal level.
 - d. Material Stresses. Describe the value to be used for the allowable or working stresses of the principal structural materials. State the design stress values for the materials of construction.
 - e. Furnish all other necessary preliminary calculations for typical roof, floor, and foundation members as applicable for the structural system proposed.

6.3.2 Drawings.

Furnish sufficient plans for foundations, and framing plans for roof and floors, as applicable, to indicate layout of principal members. Typical sections should be furnished through roof, floor, and foundation indicating materials and type of construction proposed. The architectural wall sections may satisfy this requirement. Furnish a plan identifying the location of all seismic joints.

6.3.3 Specifications.

Provide a listing of specifications in the design analysis.

6.4 FINAL DESIGN

6.4.1 Design Analysis.

Furnish complete checked calculations for all structural members. Incorporate any changes required by comments on interim submittal.

6.4.2 Drawings.

Furnish complete final plans and details of all structural elements. Before this submittal, coordinate structural drawings with all other design disciplines. Always include the items listed below on the final drawings if applicable:

- a. A general structural notes sheet indicating design criteria and material requirements. Include criteria on wind, snow, seismic and foundation requirements. List the material requirements for masonry, concrete and steel.

- b. Roof framing plan and details including details of any opening in the roof.
- c. Intermediate floor framing plans and stair details on multiple story structures.
- d. Stress or load diagrams of features to be construction contractor designed (e.g., connector plates on wood trusses that are construction contractor designed based on member stress information shown by the Engineer on the structural drawings).
- e. Column schedule, beam schedules, and connection schedules.
- f. Foundation plan including any notes relative to special foundation treatment required and cross-references to proper specification sections.
- g. Foundation section and details.
- h. Layout of expansion, construction, and contraction joints in floor slabs; horizontal and vertical joints in foundation walls; joints in footing; and layout of control joints in masonry walls.
- i. Typical and special sections as required.
- j. Details of expansion, construction, and contraction joints in concrete.
- k. Layout and detail of exterior entrance pads and steps.
- l. Lintel plan(s) and schedules.
- m. Masonry wall elevations as required.
- n. Details of any special items.
- o. General and special notes as required.

6.4.3 Specifications.

Provide a complete set of fully edited specifications from the listing given at the interim design.

Chapter 7.0 – MECHANICAL – HVAC, PLUMBING, AND FIRE PROTECTION

7.1 GENERAL

This chapter provides guidance for preparation and development for each of the different required submittal stages.

7.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below list additional requirements specific to this discipline.

7.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

7.2 CHARRETTE DESIGN

7.2.1 HVAC.

7.2.1.1 Discuss with the user and Project Engineer/ Architect the known and allowable HVAC alternatives and requirements. Include the alternatives in the narrative.

7.2.1.2 Discuss base requirements to communicate with a base-wide EMCS

7.2.2 Site Utilities.

Refer to Chapter "Site Mechanical Utilities".

7.2.3 Plumbing.

Include a discussion of special plumbing needs and requirements.

7.2.4 Fire Protection

7.2.4.1 Discuss with the Fire Department or base any special requirement the local fire department may have such as a fire department connection type.

7.2.4.2 Obtain fire flow data relevant to the site at the earliest practicable time. (Note that UFC 3-600-01 paragraph 4-1.3 requires the designer to perform or witness a flow test on hydrants near site, not just receive fire flow data from others.)

7.3 INTERIM DESIGN

7.3.1 Design Analysis.

The charrette narrative forms the basis of the future design analyses. Include the following in narrative form:

7.3.1.1 Heating, Ventilating and Air-Conditioning (HVAC).

- a. List of Criteria - Codes and manuals used to create the design - design technical instructions or manuals, pamphlets, technical references, and other design guidance or criteria used in the design and their updates.
- b. Design conditions used in calculations – inside and outside temperatures, personnel load, equipment heat release (if any), energy sources, outside air or ventilation requirements, U-factors, and other special conditions.
- c. Include discussion and calculations for Special Considerations, when required, in the Analysis.
- d. Detailed system heating and cooling load calculations. Use Corps of Engineers approved electronic calculation software.
- e. Provide narrative descriptions of the systems considered, justification for selection, intended equipment, description of air distribution, zoning, HVAC controls description, and description for any connections to existing systems.
- f. Describe the various equipment items.
- g. Describe the piping systems.
- h. When specifically required, provide Energy Monitoring and Control System (EMCS) or Utility Monitoring and Control Systems (UMCS) requirements narrative identifying existing EMCS/UMCS conditions, and requirements for providing new or future interface EMCS/UMCS on this project.
- i. Provide a list of items for which any additional criteria, clarification, or guidance is required by the designer to complete the design.
- j. Describe major items that deviate from the Design Guide standards.

7.3.1.2 Plumbing.

- a. Criteria listing - manuals, applicable codes and standards, etc.
- b. Plumbing calculations as necessary to determine number of fixture units, cold and hot water capacity requirements, and equipment or capacities of miscellaneous and special systems indicate male and female building populations.
- c. Fixture determination listing quantity and type of fixtures and other fixtures such as drinking water fountains, service sinks, kitchen equipment, and vehicle wash equipment, etc.
- d. Description of domestic water heating and storage equipment, including capacity, type (gas, electric, boiler, water), materials, and insulation.
- e. Include a brief description of miscellaneous systems such as compressed air (capacity, pressure, piping, location of air outlets, etc.), roof drainage, natural gas (pressure, quantity, and equipment served), vehicle exhaust, and other special systems.
- f. Include a brief description of whether a radon system is required, and radon system planned,
- g. Provide a list of items for which additional criteria, clarification, or guidance is required.
- h. Describe major items that deviate from the Design Guide standards.
- i. List of information required to complete the design.

7.3.1.3 Fire Detection and Suppression System.

- a. List of Applicable Criteria - NFPA, UFC 3-600-01, and other applicable governing criteria.
- b. Listing of the hazard classifications for each space and discussion of protection requirements for specific hazards.

- c. Discussion of fire protection features for each building to reflect the types of systems considered with a description of the systems selected.
- d. Provide a detailed description of the fire suppression system and its controls such as activation of the system, interlocks with the HVAC system, and connection to detection and alarm systems. Describe the fire detection and alarm system features that are used to actuate the suppression systems.
- e. If water sprinkler systems are required, provide preliminary hydraulic calculations for the most hydraulically demanding area to insure the flow and pressure requirements are met with current water supply. Provide results of flow test data with preliminary hydraulic calculations. Make recommendations about the plumbing requirements, the sprinkler system requirements, and backflow.
- f. Identify the requirements for fire pumps and storage tanks based on preliminary calculations.
- g. Describe major items that deviate from the Design Guide standards.

7.3.2 Drawings.

Provide plan views showing the features listed.

- 7.3.2.1 Heating, Ventilating, and Air Conditioning (HVAC). Include heating, ventilating, and air-conditioning equipment layouts and include locations of major pieces of equipment. Include the air distribution duct layouts for supply, return, ventilation and exhaust ducts (single line duct layouts are permissible in this submittal), hoods, and other items of major equipment required for the facility. Include major pieces of equipment listed. Provide schedules filled out with what is known; schedules are not required to be completed.
- 7.3.2.2 Plumbing. Plumbing fixture layout, floor and area drains, and plumbing equipment layouts (hot water generator, storage tanks, air compressors, etc.).
- 7.3.2.3 Outside Utilities. (See Chapter: Mechanical Utilities)
- 7.3.2.4 Fire Suppression System. Prepare a plan for each floor of each building. Provide the following types of information:
 - a. Indicate all building areas, their sprinkler hazard classification, and extent of fire protection.
 - b. Provide the location of any major fire suppression equipment or features such as, fire service line location, sprinkler risers, standpipes, inspector test and drain, fire department connections, pump, etc.
 - c. Provide the location and hazard of any special fire suppression systems such as in-rack sprinkler systems, deluge systems, and hose racks.

7.3.3 Specifications.

Provide a listing of mechanical and plumbing specifications in the design analysis.

7.4 FINAL DESIGN

7.4.1 Design Analysis.

- 7.4.1.1 General. The final design analysis is a refinement of the prior design analysis and contains all the information called for in those sections of this chapter. Include required and missing information that was not included in prior submittal phases.

- 7.4.1.2 HVAC Equipment. Provide equipment sizing calculations with summaries of all major items of mechanical equipment such as air handling units and coils, condensing units, water chillers, boilers, pumps, humidifiers, cooling towers, fans, water heaters and tanks. For all computer-generated calculations (cooling loads, heating loads, pipe sizing, duct sizing, etc.), the design analysis shall contain layout sketches that show how the building or system was segmented for computer input. Show manufacturers' make and model number of equipment used for design purposes, and show weights of major items of equipment. Provide vendor information for equipment selected and mark the specific items on the vendor's literature.
- 7.4.1.3 Piping. Include all mechanical pipe-sizing computations in the analysis. Show design flow, pipe size, friction factors, slopes, lengths, and elevations (where applicable), quantity conducted, and velocity in the various mains and branches. Where necessary, include flow diagrams in the analysis.
- 7.4.1.4 Ducting. Show all duct sizing computations in the analysis. Show friction loss and clearly indicate the air velocities encountered in the main ducts. Where necessary, include flow diagrams in the analysis. Provide static pressure on fans and air handling units based upon complete takeoff of static losses. Include filter losses.
- 7.4.1.5 Sprinklers. For fire sprinkler system information, include hazard classification, zoning (if appropriate), and sizes of all riser pipes including wet and dry pipes, sprinkler valves, mains, and principle branches based on available water pressures by either computer-generated hydraulic analysis, or manual calculations. Provide the results of the analysis for a fire pump. When a fire pump is required, provide vendor information on the pump. Provide computations for other applicable systems such as standpipe, deluge, or in-rack sprinkler systems.

7.4.2 Drawings.

- 7.4.2.1 General. Final drawings are complete and solicitation ready when all necessary details, layout drawings, section views, plan views, and schedules are finished and include the incorporation of all review comments and resolutions.
- 7.4.2.2 Sections and Elevations. Show sufficient sections and elevations to indicate clearly the exact location of the particular item in relation to other building or equipment items. Sections shall indicate critical interference between mechanical items and building features.
- 7.4.2.3 Details. Provide sufficient elevations and details to allow construction and installation of the work without additional design work by the construction contractor.
- 7.4.2.4 Accessories. Where equipment connection details are shown, indicate all required valves, gages, and fittings required and minimum sizes. Coordinate with specification requirements and make sure valves, fittings, etc., that are specified are included in the detail furnished with each piece of equipment.
- 7.4.2.5 Mechanical Room Plans. Include an enlarged plan of the mechanical room(s) indicating all equipment with, as a minimum, the manufacturer's recommended maintenance clearances between each item. Indicate adequate spacing for HVAC controls, electrical panels and other similar items. Indicate space required for placement of all such items as coils, filters, heat exchanger tubing, motors and belts on the plan. Show routing of hydronic piping, location of sprinkler riser, and location of plumbing items such as water heaters and air-compressors.

- 7.4.2.6 **Sizes.** Final plans must show all pipe and duct sizes. Draw ductwork to scale on plans. Provide details of catwalks, ladders, platforms, access panels, and doors necessary for operation and maintenance of equipment, valves, and accessories. Show all locations of turning vanes, and all volume, fire and smoke dampers.
- 7.4.2.7 **Performance Characteristics.** Place performance characteristics for all items of mechanical equipment in the equipment schedules.
- 7.4.2.8 **Schedules.** Verify that all schedules reflect the necessary equipment information so that the contractor can select all of the equipment without referring to a specific model/manufacturer's product. The loads indicated on the schedules are the minimum demand requirements from the design calculations for the building features, instead of the sizing items from the vendor catalog information.
- 7.4.2.9 **HVAC.** Include complete HVAC control plans. Provide DDC controls drawings as required by the design. Include all of the COE standard drawings for each system type. When required, provide details of EMCS and final EMCS input/output summaries. Sequence of control is permitted on the drawings or in the specifications. In either case, provide sequence of control for all HVAC equipment items. (Note, typical sequence of control is found on the COE standard control drawings templates.)
- 7.4.2.10 **Air Flow.** Where critical, indicate on the drawings the air suction and discharge directions of such items as fans, air-cooled condensers, and cooling towers.
- 7.4.2.11 **Fire Protection Drawings.** For normal projects, label fire protection drawings as "PRELIMINARY," and provide a water flow test and results, sprinkler design densities, demand areas, specific areas protected, hazard classification of all areas, sprinkler head coverage, zoning requirements, pump sizing and locations, building entrances, exact control system locations (must include all locations if shown), and device locations.

7.4.3 Specifications.

Provide a complete set of fully edited specifications from the listing given at the interim design.

Chapter 8.0 – ELECTRICAL

8.1 GENERAL

This chapter provides guidance for preparation and development for each of the different required submittal stages.

8.1.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above for the general requirements for submittals at each design stage. Below lists additional requirements specific to this discipline.

8.1.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design/Build.

8.2 CHARRETTE DESIGN

8.2.1 Design Analysis.

Design analysis shall include the following items:

- 8.2.1.1 Site Utilities. Describe the available electric power to include an estimated building load and general description of existing system (voltage, wire size, wire and pole conditions, etc.) for this stage. If the primary source is inadequate, state measures proposed to correct the deficiency in the design. Certify that this contact has been made.
- 8.2.1.2 Utility Company. Identify the utility company for the electric service or POC on the military facility.
- 8.2.1.3 Secondary Power. List voltages used for power distribution. Include metering requirements.
- 8.2.1.4 Special Conditions. List requirements for UPS or generators, power filtering etc.
- 8.2.1.5 Hazardous Locations. List all hazardous locations.
- 8.2.1.6 Lightning Protection. Determine and list the risk assessment for Lightning Protection.
- 8.2.1.7 Security Requirements. List any special security requirements.
- 8.2.1.8 Communications. List communications provider and if a Letter of Intent (LOI) is required.
- 8.2.1.9 Information Technology Systems. List requirements for Information Technology Systems requirements and inter-building connectivity. At this point in the design process, the design team will make fundamental decisions on IT requirements such as fiber optics IT distribution within and between the buildings and/or campus.
- 8.2.1.10 Cable TV. List if it is required.
- 8.2.1.11 Public Address System. List if a public address system is required for the facilities.

- 8.2.1.12 Fire Alarm/ Mass Notification System. List the remote signal transmission and receiving requirements.
- 8.2.1.13 Cathodic Protection. List requirements for Cathodic Protection.
- 8.2.1.14 Miscellaneous Information. Provide a listing of additional information or material required to complete the design or state that additional information is not necessary.

8.2.2 Drawings.

Provide site plan for existing conditions, demolition, and new utilities. Obtain contact information for any excavation permits that may be required. Obtain standards from past personnel were applicable for:

- exterior street lighting fixtures
- parking lot lighting fixtures.

Review the floor plan and insure that adequate space exists for all electrical equipment including panels, motor control centers, telephone backboards, LAN racks, fire alarms, Information Technology rooms, etc...

- 8.2.2.2 Communication Plan. Revise the Communication Plan with project specific requirements. Send all IT plans to Ft. Detrick for them to review and comment.

8.3 INTERIM DESIGN

8.3.1 Design Analysis.

Include estimated connected load schedule, data, and calculations to support design decisions. Include a concept light fixture schedule and catalog cuts of commercial fixtures proposed.

- 8.3.1.1 Engineering Calculations (preliminary). Do preliminary calculations based on building area to estimate overall loads.
- 8.3.1.2 Field Trip Report. Furnish a report on any additional site visits required for the project. The report will contain minutes of any meetings held with facility personnel along with names, phone numbers and a summary of agreed to actions. Unforeseen site/building conditions will also be documented in the report.
- 8.3.1.3 Energy Conservation Design Narrative. Highlight energy conservation measures proposed for the project. The electrical engineer shall participate in the energy budget preparation and shall provide necessary information to the architect and mechanical engineer for inclusion in the energy budget. Describe measures and techniques that are proposed in the electrical design that will conserve energy.

8.3.2 Interior Electrical System Design Narrative.

Include the following:

- 8.3.2.1 Characteristics. Indicate electrical characteristics (voltage, phase, number or wires) of electrical system.
- 8.3.2.2 Lighting. Provide a brief description of the proposed lighting system(s) for major areas of the project. Include a concept lighting fixture schedule showing room name and /or number, lighting intensity, type of fixture (by standard drawing number or catalog number), voltage, amperage, mounting (wall or ceiling), mounting height, and basis of design such as I.E.S., etc.

- 8.3.2.3 Emergency Lighting. Provide description of emergency lighting system. Emergency lighting is to be per NFPA 101, International Building Code, and the National Electrical Code, at a minimum.
- 8.3.2.4 Wiring. State type of wiring system, such as: rigid conduit or intermediate conduit, electrical metallic tubing, nonmetallic sheathed cable, etc., and where it will be used.
- 8.3.2.5 Specials. Provide paragraph describing proposed addition and alterations of special items of design, such as, specialized equipment, special receptacles, physically disabled and seismic requirements, etc., include description and location of special power outlets and circuits (volts, phase, and amps). Reference pertinent NEMA or any recognized standards to identify the type receptacles selected. Include documentation of the source of the criteria.
- 8.3.2.6 Hazard Classes. Define any hazardous area by class, division and group as defined in the National Electrical Code (NFPA70) and indicate type of equipment proposed for use in the area.
- 8.3.2.7 Lightning Protection. Use NFPA 780, “Standard for the Installation of Lightning Protection Systems” to determine risk. Describe lightning protection system; if none, so state.
- 8.3.2.8 Grounding. Describe grounding system to be installed, if required. If a counterpoise, grid, etc., is to be used, state the standards to be used in design and calculations.
- 8.3.2.9 Service. Describe service entrance and interior distribution equipment selected as a result of load. Provide these calculations with the D.A.
- 8.3.2.10 Equipment Data. Describe basic characteristics of panelboards, protective devices, switchgear, motor control center or other major equipment to be provided.
- 8.3.2.11 Metering. Describe electrical metering equipment to be provided. If the Installation has an EMCS, coordinate metering requirements with the energy analysis. Coordinate with utility provider for meter requirements they may have.
- 8.3.2.12 Systems.
- a. Describe any additional electrical requirements that are unique to the facility.
 - b. Describe type of fire detection and alarm systems.
 - c. Describe the Mass Notification System.
 - d. Describe the intrusion detection system. (Design information on conduit and box locations and sizes will be furnished by the Using Activity.)
 - e. Describe the telephone system requirements including the type system, the type of instruments and the size of the installation including stations, trunk size, connection to and location of switch, and all instructions received from the Directorate of Information Management (DOIM) (Army). Write a “Letter of Intent” detailing the responsibilities of all parties involved in the communication system design, installation and operation. Provide a copy to all responsible parties.
 - f. Design the Network Operations Center and associated rooms in accordance with National Guard Information Technology Requirements.
 - g. Describe type of fire alarm detection system.
- 8.3.2.13 Miscellaneous Information. Provide a listing of additional information or material required to complete the design or state that additional information is not necessary.

8.3.3 Exterior Electrical Distribution System Design Narrative.

Include the following in the exterior design narrative:

- 8.3.3.1 Primary. Contact the Directorate of Public Works (DPW) / Base Civil Engineer (BCE) (or local power company) to obtain information relative to the adequacy of the primary supply at the point of takeoff. If the primary source is inadequate, state measures proposed to correct the deficiency in the design. Certify that this contact has been made.
- 8.3.3.2 Power Supply. Provide electrical characteristics of power supply from the service point to the main service equipment (voltage, phase, number and size of conductors).
- 8.3.3.3 Connected Load. Narrate conclusions in the D.A. related to the estimated total connected load and estimated KVA demand load. Indicate type, number, and KVA capacity of transformer installation proposed. State primary and secondary connection of transformers (i.e. 12470 to 480Y/277 volts, Delta-wye).
- 8.3.3.4 Distribution. State basis for selection of primary and secondary distribution voltage, i.e. 480Y/277 vs. 208Y/120.
- 8.3.3.5 Conductor. State type of conductor, such and where they are proposed to be used and a justification for the choice made.
- 8.3.3.6 Design Standards. Provide a statement describing standards of design such as, primary and secondary voltage drop, and physical characteristics of aerial or underground circuits. State the basis for the selection of aerial or underground distribution. State actual primary voltage drop for size of primary distribution conductors proposed to serve the load. Reference applicable conclusion and/or calculations in the D.A. State short circuit current available at project site if it can be obtained from the user. If not, so state.
- 8.3.3.7 Exterior Lighting. Provide a statement describing street lighting, security, parking lot lighting, or sidewalk lighting requirements. Types of fixtures, pole heights, and proposed lighting intensities are to be included.
- 8.3.3.8 Scope of Exterior Work. Provide a statement describing the extent of any exterior work such as telephone lines, television (TV) distribution cables, etc. State whether circuits are aerial or underground. If underground state whether direct burial or concrete-encased duct bank. Include all information and instructions received from the Activity's Director of Information Management (DOIM).
- 8.3.3.9 Miscellaneous Information. Provide a listing of additional information or material required to complete the design or state that additional information is not necessary.

8.3.4 Drawings.

- 8.3.4.1 Interior Electrical. Provide interior electrical drawings showing lighting, receptacles, telephone outlets, special and general purpose power receptacles and lighting fixtures. Since these portions of the electrical design cannot be completed until the mechanical and furniture layouts are completed only preliminary drawings should be submitted with the exception of the Communication Drawing (see below). Also provide fire alarm/mass notification devices, fire alarm/mass notification and detection system and fire alarm/mass notification installation drawings.

- 8.3.4.2 Emergency Lighting. Show the location of emergency lighting fixtures including exit signs and exterior path illumination. Include this information on the life safety code drawings
- 8.3.4.3 Communications. Identify any existing and new communications service connections, both aerial and underground. Indicate characteristics and standards of design for aerial or underground communication lines. Describe who will be responsible for all final terminations.
- 8.3.4.4 Site Plan. Provide a separate electrical site plan or sheet reference indicating all existing and proposed support utility lines and equipment required to serve the project including electrical power lines, all roads and driveways, parking areas, and other items necessary for functional and operating adequacy. Indicate the extent of any demolition to be done. If extensive, provide separate drawings with independent legend for new work.
 - a. Exterior Lighting. Indicate location and type of exterior lighting proposed (street lighting, security lighting, or parking lot lighting).
 - b. Capacity. Indicate the type, number, location, KVA capacity, primary and secondary voltage of the transformer installation proposed. Identify the capacity of the transformer(s) based on area calculations and site lighting estimates.

8.3.5 Specifications.

Provide a listing of specifications in the design analysis.

8.4 FINAL DESIGN

8.4.1 Design Analysis.

- 8.4.1.1 Submittal. To support this submittal, provide a complete design analysis, updated to reflect changes from prior submittals. The final DA shall be complete, not just amendments to previously submitted design analyses
- 8.4.1.2 Calculations. Provide design calculations and supporting documentation to support design considerations. Calculations shall be computed and checked by separate individuals, one of which must be a registered electrical engineer. Indicate the names or initials of these individuals on the page or insert carrying the calculations. Supporting documentation shall be clear, and formulas and references shall be identified. Assumptions and conclusions shall be explained and cross-referencing shall be clear. When a computer program is used, name the program and describe and include a flow chart showing how the program reaches solution. Include calculations and data for the following in the analysis:
 - a. Lighting calculations.
 - b. Short-circuit calculations.
 - c. Voltage drop calculations.
 - d. Existing loading data where connections are made to existing transformers or load centers including method determining the availability of sufficient capacity for the additional loads.
 - e. Calculations of all connected loads, demand factors, and demand loads by circuit number for each panel and switchboard. Show amp-interrupting circuit ratings for each switchboard and panelboard.
 - f. Requirements for cathodic protection.

- g. Trade names are not allowed on the contract plans and specifications. However, for lighting fixtures and other equipment such as motor control centers, switchgear, bus duct, transformers (where special features are required), special receptacles, etc., Include the current manufacturer and catalog number of the equipment in the D.A.
- h. TV System Requirements.
- i. Lightning Protection Risk Assessment

8.4.2 Drawings.

Complete all of the previous submitted interim drawings, and all additional required drawings for a full design package.

- 8.4.2.1 Details. Include all details for final package on drawings. For congested areas that might interfere with various electrical systems, cable trays, piping, ducts, etc., thoroughly detail by expanded scale drawings.

8.4.3 Specifications.

Provide a complete set of fully edited specifications from the listing given at the interim design.

- 8.4.3.1 References. Add publication references, paragraphs, and descriptions for items not adequately covered by specifications.
- 8.4.3.2 Availability. Ascertain that major or special types of equipment are available commercially.

Chapter 9.0 – NOT USED

9.1 NOT USED

Chapter 10.0 – ENVIRONMENTAL

10.1 GENERAL.

10.1.1 REQUIREMENTS

Environmental requirements are project and location specific, and could include site asbestos survey and remediation planning, building asbestos survey and demolition, lead paint and environmental lead identification and remediation planning, radon assessment, reporting and abatement design, and a variety of other site and building environmental concerns,

Refer to SECTION 01 02 00.00 48 – STATEMENT OF WORK, the Outline Specifications, and other portions of the Solicitation for the particular project environmental conditions and requirements.

10.1.2 DESIGN CRITERIA

Refer to Chapter 1 "All Disciplines" above, paragraph: Reference Documents, and overall general requirements description.

10.2 CHARRETTE DESIGN, INTERIM DESIGN, AND FINAL DESIGN

10.2.1 Submittal Requirements.

Refer to Chapter 1 "All Disciplines" above, paragraphs concerning the requirements at each submittal state

10.2.2 BIM Submittal Requirements

Refer To Appendix 1– BIM Instructions, and Appendix 3 – BIM Submittal Requirements for Design Build.

APPENDIX

(Separately bound)

APPENDIX 1 – BIM INSTRUCTIONS

APPENDIX 2 – (not used with Part C)

**APPENDIX 3 – BIM SUBMITTAL REQUIREMENTS FOR
DESIGN BUILD**

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APPENDIX 1– BIM INSTRUCTIONS

NOT USED

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APPENDIX 3 – BIM SUBMITTAL REQUIREMENTS FOR DESIGN-BUILD

Chapter 1.0 ALL DISCIPLINES

1.1 GENERAL

Applicability: *BIM may be a contract requirement, or may be at designer's option. Refer to the project's contract documents. For example Section 01 03 00.00 48 DESIGN SUBMISSION REQUIREMENTS AFTER AWARD has alternate text such as below governing whether BIM is a part of the work:*

"[Prepare documents using Building Information Management (BIM) technology as described in the Appendices of the " Design Process and Submittal Requirements Manual.]"

"[Preparation of the documents using Building Information Management (BIM) technology as described in the Appendices of the " Design Process and Submittal Requirements Manual is at the Designer's option, and is not a Contract requirement.]"

This chapter states the minimum Building Information Model (BIM) requirements for each submittal phase. All submitted BIM models, extraction files, extraction definitions, sheet files, renderings, Navigator files, and output files shall be created using Revit, Building Suite of tools.

Since the concept of BIM is to digitally build the structure, it is inherent that all design work be performed from the perspective that all elements and relationships between them are modeled, as they would be built. The designer shall use sound engineering, architectural, and construction judgment when placing elements on specific parts within families within BIM. The family and part configuration provided within this dataset does not intend to account for all types of construction elements; rather the intent is to establish a solid starting base to be built upon. The designer of record must understand the use of parts within the BIM in order for them to expand this list for their specific project needs. Family and parts must be used to differentiate groups of elements with the BIM in order to create the following:

- Quantity takeoffs for calculation of cost of all construction materials and activities related to the installation of those materials.
- Extraction and re-symbolization of model data to files for the creation of contract drawings on sheet borders.
- Renderings of the BIM for communication of design and as a deliverable to the client.
- Support of the construction model data extraction
- Querying of elements so to make simultaneous changes to multiple design elements as needed.
- Level management – to comply with A/E/C CADD Standards and National BIM Standards
- Design schedules and construction sequencing.

1.2 CHARRETTE SUBMITTAL

Include in the charrette BIM submittal all major components of civil and architectural. Using the extraction processes bring all charrette submittal drawings directly from the model. Civil drawings for this submittal may be drawn using traditional CADD.

Submit a completed space layout drawing using Revit Architecture and the USACE Default Dataset. Indicate room names and numbers in the spaces along with the placed and programmed square footages. Provide datagroup information associated with the spaces from the Default Dataset.

Provide an exported Excel spreadsheet space schedule form the space layout drawing to validate the 1391/1390 and 5034R. Spreadsheet shall indicate the differences in areas between approved square footages and placed square footages.

Refer to Part C Design/Build -- Design Submittal Requirements After Award, Chapter 1 "All Disciplines", paragraph: Charrette Design Meeting And Submittal; Revised Charrette Document and Submittal.

Also refer to discipline-specific BIM requirements that are outlined below.

1.3 INTERIM SUBMITTAL

Include all of the major components of civil, architecture, interior design, structural, mechanical, electrical, fire protection, and information systems as well as complete building elevations. The paragraphs that follow describe most conditions for when an element is to be in the model. In general, as a minimum requirement include in the model all elements normally shown in ¼" = 1'-0" scale drawing or detail. It is left to designer's judgment for additional detailing in the model.

Schedules – Provide a door and room finish schedules from the BIM indicating the materials and finishes used in the design. The room finish schedule template is provided within the dataset. Also, provide a special item schedule and/or notes indicating any special items required for the design. Due to the specific nature of the special items schedule, it is not required as output of the BIM, but there are additional templates in development, and these will be required on future projects to support specific output tasks of the design team.

Extractions – The extraction process must be well established at the interim submittal. Complete most extraction definitions within the master models. It is suggested that the design team begin with the extraction definitions provided with the dataset and build from there.

Datagroup – At the interim submittal the Datagroup information is to be complete. No further edits are to be expected after interim unless large building usage changes have been made. Link all excel spreadsheet output to a sheet design file and submit.

Dataset – Resolve all dataset issues at the interim submittal. Submit any additional families, parts, line styles, special dimension styles, or level at this and every submittal.

Quality verification – Complete all quality checks listed in Appendix 1 - "QA/QC and Detection of Changes to the Dataset" for all files and disciplines created with BIM. Submit output of those checks with the normal submitted materials. In addition, submit documentation of all unresolved interferences, standards, elements along with an explanation. Complete a quality check for compliance with the A\E\C CADD Standards on the final file condition prior to submittal and include the results of that standard check in the submittal.

Drawings – Generate all drawings that contain information residing in the model from the BIM in the extraction process. Standard details, index sheet, and other typical drawings need not be included in the BIM.

Part and Family Report – The model must support the Part and Families contained on the standard BIM Dataset. Submit a report that validates the parts and families of the BIM model.

Interference Manager Report- Check the BIM models with Revit's Interference Manager. Check the interferences between structural, mechanical, and architectural models. Generate a report showing design team sign-offs for soft and hard interferences. Submit this report as part of the interim and final submittals. Also submit a Revit file to highlight structural and mechanical interferences.

Configuration verification report- Generate a configuration report showing that all system valuables are using the correct workspace and datasets.

1.4 FINAL SUBMITTAL

Include all of the major components of civil, architecture, interior design, structural, mechanical, electrical, fire protection, and information systems as well as complete building elevations. The paragraphs that follow describe most conditions for when an element is to be in the model. In general, as a minimum requirement include in the model all elements normally shown in ¼" = 1'-0" scale drawing or detail. It is left to designer's judgment for additional detailing in the model.

Schedules – Report all instance data into the appropriate schedules. Also provide any special schedules and/or notes indicating any special items required for the design.

Extractions – Fully complete the extraction process.

Datagroup – Fully complete the Datagroup information.

Dataset – Resolve all dataset issues. Submit any additional families, parts, line styles, special dimension styles, or level at this and every submittal.

Quality verification – Complete all quality checks listed in Appendix 1 - "QA/QC and Detection of Changes to the Dataset" for all files and disciplines. Submit all output of those checks with the normal submitted materials. In addition, submit documentation of all unresolved interferences, standards, Revit elements along with an explanation. Complete a quality check for compliance with the A/E\C CADD standards on the final file condition prior to submittal and include the results of that standard check in the submittal.

Design Analysis - The model must support the design analysis whenever possible and prudent. That decision must be made by comparing the value of the output from the model versus the work added to computer processing which is affected by the level of detail. If the project has a kitchen, then the information within the kitchen must be equivalent to data provided in cut sheet details.

Drawings – Generate all drawings that contain information residing in the model from the BIM in the extraction process. Standard details, index sheet, and other typical drawings need not be included in the BIM.

Part and Family Report – The model must support the Part and Families contained on the standard BIM Dataset. Submit a report that validates the parts and families of the BIM model.

Interference Manager- Check the BIM models with Revit's Interference Manager. Check the interferences between structural, mechanical, and architectural models. Generate a report showing design team sign-offs for soft and hard interferences. Submit this report as part of the interim and final submittals. Also submit a Revit Interference Manager file to highlight structural and mechanical interferences.

1.5 AS-BUILT SUBMITTAL REQUIREMENTS

1.5.1 SYSTEM MODELS

The As-Built models shall be complete and incorporate all modifications from the previous (As-Awarded) submittal that affect the models. Include with the submittals the extraction files, sheet files, special patterning, line styles, cells, reference files or other specific files used to create the drawings as output of the model, and any modifications to the BIM dataset.

1.5.2 DRAWING EXTRACTION REQUIREMENTS

Update all extractions to include any changes that occurred during construction.

Also see discipline specific requirements in Design/Build – Design Submittal Requirements After Award.

Chapter 2.0 – FY08

2.1 All FY08 projects shall meet the following minimum requirements.

2.1.1 ARCHITECTURAL:

2.1.1.1 CHARRETTE SUBMITTAL

The design team will in a maximum of thirty (30) days prepare the following documents:

- Completed single line space layout drawing using the Create Space tool in Revi Building Suite of tools.
- Exported Excel spread sheet from the space layout using Instance Data tool. The spread sheet will contain the following information: Room name, room number, building type, floor location, authorized square footages and placed square footages.
- Validation of 1391 and 5034R in a spreadsheet format that will show approved square footages and area differences in program square footages.
- Extracted floor plan from the 3D model. Floor plan will have door locations and room names and numbers shown in the extraction. And key features from the placed modules.
- 3D massing model illustrating building exterior and key features. The massing model is to only identify scale of the building exterior. Material selection is not required. The massing model will be extracted from model to produce 2D building extractions. Also the massing model will be submitted in 3D Adobe PDF.
- A schematic roof plan will be extracted to produce a 2D roof plan. Roof plan will show how water is to drain, roof slope, and roof material.
- Charrette participants will comment on the charrette submittal using spreadsheet format. The A/E Project Manager will set this up for each submittal of the project.

2.1.1.2 INTERIM SUBMITTAL

a. ARCHITECTURAL MODELS

The Architectural systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼" to 1'-0" scaled drawing. Additional minimum requirements are listed below.

Walls – Include in the architectural model(s) all walls, both interior and exterior. Model at this stage exterior banding or brickwork, entrance features, and special interior features, all for communication to the client at review. Re-symbolize extractions properly to identify them.

Doors and Windows – Model doors and windows to represent the actual size and location on all exterior elevations. Doors and windows shall be placed using the Revit door or window tool and they shall be of a cell type that supports the door and window templates provided by the USACE BIM Dataset CD as well as the datagroup system for labeling and other BIM functions.

Roof – Model the roof system within the BIM. The level of detail for the roof system must be adequate to communicate the roof configuration and the method by which the water is removed

from structure. Again, this is to be modeled as it is built. This does not mean that the entire roof structure must be modeled at this submittal, but it does mean that an adequate place-holder representing size, shape and configuration must be modeled. Most quantities can be derived from the surface area and the depth of the roof assembly.

Spaces – The spaces are a very important element in the interim submittal. Model them to complete accuracy, so as to obtain accurate net square footage requirements and to hold data for the room and finish schedules which draw information from them. Finalize room names and numbers within the model for output to schedules.

Space Layout – Produce the final space layout from the BIM. Indicate room names, room number, and placed and authorize square footages. Reflect in the space layout all modifications to the approved charrette space layout. Address any significant changes in a report stating reasons for the change.

Fly-Through – Submit a simple exterior fly-through of the facility. Indicate in the fly-through key features of the facility, in order to communicate to Army representatives and end users the exterior materials used. Indicate in the fly-thru the facility massing and scale. This will give user buy-in early on in the design. **Applicability:** *Fly-thru may be a contract requirement, or may be at designer's option. Refer to the project's contract documents.*

Renderings – Generate three or four exterior renderings to illustrate key features and scale of interior and exterior design features. This rendering is to be used for communication purposes only, and is not the professional rendering.

2.1.1.3 DRAWING EXTRACTION REQUIREMENTS

Composite Floor Plan - If the main floor plans must be shown in segments in order to comply with the requirements of the proper scale, provide a smaller scale floor plan from the BIM showing exterior wall, interior partitions, and circulation elements and cross referencing for enlarged floor plans and sections. Show overall dimensions on the floor plan and gross building areas tabulation on the drawing. Tabulated data such as gross sq footage shall be considered output of the model.

Floor Plans - Provide floor plans from the BIM at 1/8"=1'-0" or 1/4" = 1'-0" (1:100 or 1:50) scale. Show gross floor area tabulations if no composite sheet is included. Tabulated data such as gross sq footage shall be considered output of the model.

Building Elevations - Provide building elevations from the BIM showing openings, principal exterior materials and general profiles of the building (scale shall be the same as the floor plans).

Roof Plan - Provide a roof plan from the BIM showing the roof configuration and methods by which rain is directed to the building perimeter.

Building and Wall Sections - Provide typical wall sections (1:20 minimum scale) that indicate major elements. Wall sections shall be unbroken where practical and indicate materials and floor-to-floor heights. Building and wall sections shall be from output of the model, but building details are typical and at such a large scale that they are not required as output of the BIM.

Reflected Ceiling Plan - Provide a ceiling plan from the BIM that indicates ceiling. Indicate room names and numbers.

Fire Protection/Life Safety Plan - Provide fire protection/life safety drawings from the BIM that indicate travel distances. Provide a summary of the code analyses.

Also see discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

2.1.1.4 FINAL SUBMITTAL

a. ARCHITECTURAL MODELS

The Architectural systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼" to 1'-0" scaled drawing. Additional minimum requirements are listed below.

Walls – Include in the architectural model(s) all walls, both interior and exterior. Model them as they would be built; meaning with enough detail to get quality quantity takeoffs on all construction materials used. They shall also be accurate enough that all floor plan and elevation extractions are accurate to the design intent. Model exterior banding or brickwork, entrance features, and special interior features for communication to the client at review. Each wall shall be to the exact height, length and width so to properly account for space allocation. Indicate fire rating of walls by utilizing the proper family and part for those wall types. Re-symbolize extractions properly to identify them.

Doors and Windows – Model doors and windows to represent the actual size and location on all exterior elevations. They shall be the exact door or window that is intended by the Architect in all respects, including size and style. Place doors and windows using the Revit door or window tool and of a cell type that supports the door and window templates provided by the USACE BIM Dataset CD as well as the datagroup system for labeling and other BIM functions. They cannot be placed as independent cells. They must be placed within these tools so that the datagroup system can accurately count and hold data for the doors and windows.

Roof – Model the roof system within the BIM. The level of detail for the roof system must be adequate to communicate the roof configuration and the method by which the water is removed from structure. Again, model the roof as it is built. This does not mean that the entire roof structure must be modeled at this submittal, but it does mean that an adequate place-holder representing size, shape and configuration must be modeled. Most quantities can be derived from the surface area and the depth of the roof assembly.

Floors – Model the floor slab in the structural model and then reference in the architectural models for each floor slab.

Ceilings – Model all ceilings using either Revit's ceiling tool or form modeling to create special ceiling features. Include all ceilings, including soffits or other special conditions. Soffits and special features shall contain enough information to show design intent.

Fly-Through – Submit a simple exterior fly-through of the facility. Indicate key features of the facility to communicate to the Army representatives and end users exterior materials used. Indicate in the fly-thru massing and scale of the facility. Fly-Through shall be provided in AVI or MOV file format. **Applicability:** *Fly-thru may be a contract requirement, or may be at designer's option. Refer to the project's contract documents.*

Renderings – Generate three or four exterior renderings to illustrate key features and scale of interior and exterior design features. This rendering is to be used for communication purposes only, and is not the professional rendering.

2.1.1.5 DRAWING EXTRACTION REQUIREMENTS

Composite Floor Plan - If the main floor plans must be shown in segments in order to comply with the requirements of the proper scale, provide a smaller scale floor plan from the BIM showing exterior wall, interior partitions, and circulation elements and cross referencing for enlarged floor plans and sections. Show overall dimensions on the floor plan and gross building areas tabulation on the drawing. Tabulated data such as gross sq footage shall be considered output of the model.

Floor Plans - Provide floor plans from the BIM at 1/8"=1'-0" or 1/4" = 1'-0" (1:100 or 1:50) scale. Show gross floor area tabulations if no composite sheet is included. Tabulated data such as gross sq footage shall be considered output of the model.

Building Elevations - Provide building elevations from the BIM showing grading, openings, principal exterior materials and general profiles of the building (scale shall be the same as the floor plans).

Roof Plan - Provide a roof plan from the BIM showing the roof configuration and methods by which rain is directed to the building perimeter.

Building and Wall Sections - Provide typical wall sections (1:20 minimum scale) that indicate major elements. Wall sections shall be unbroken where practical and indicate materials and floor-to-floor heights. Building sections shall be output of the model, but wall sections and details are typical and at such a large scale that they shall not be required as output of the BIM.

Reflected Ceiling Plan - Provide a ceiling plan from the BIM that indicates ceiling material and open ceiling areas. Indicate room numbers, light locations, registers, and all ceiling mounted items such as exit signs.

Fire Protection/Life Safety Plan - Provide fire protection/life safety drawings from the BIM that indicate fire suppression information, exit signs, pull stations, exit devices, exit distance, emergency lights, detectors, alarm locations and fire panel locations. Provide completed code analyses.

Also see discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

2.1.2 STRUCTURAL:

2.1.2.1 CHARRETTE SUBMITTAL

There are no BIM requirements for this phase.

2.1.2.2 INTERIM SUBMITTAL

a. STRUCTURAL MODELS

The Structural systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a 1/4" to 1'-0" scaled drawing. Model the systems as they would be built to get complete and accurate quantity takeoffs of relevant construction materials. They shall be complete and accurate to reflect the design intent. Additional minimum requirements are:

Foundations - The model(s) shall include all relevant foundation elements with necessary intelligence to produce the foundation plans and elevations.

Floor Slabs – The model(s) shall include the structural floor slabs with recesses, curbs, pads and penetrations.

Primary Structural Steel –The structural model(s) shall include all primary framing members for the roof and floors. They shall be accurate enough that all framing plan, sections and elevation extractions are accurate to the design intent.

2.1.2.3 DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

2.1.2.4 FINAL SUBMITTAL

a. STRUCTURAL MODELS

The Structural systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼" to 1'-0" scaled drawing. Model the systems as they would be built to get complete and accurate quantity takeoffs of relevant construction materials. They shall be complete and accurate to reflect the design intent. Additional minimum requirements are:

Foundations - The model(s) shall include all relevant foundation elements with necessary intelligence to produce the foundation plans and elevations.

Floor Slabs – The model(s) shall include the structural floor slabs with recesses, curbs, pads and penetrations.

Structural Steel –The model(s) shall include all columns, primary and secondary framing members, and bracing for the roof and floor systems (including decks), with necessary intelligence to produce the framing plans and building/wall sections.

Cast-in-Place Concrete - The model(s) shall include all cast-in-place walls, columns, beams with necessary intelligence to produce plans and building/wall sections

Stairs – The structural model(s) shall include all framing members for the stairs with necessary intelligence to produce plans and building/wall sections.

Elevators - The structural model(s) shall include the shaft, pit, and door openings with necessary intelligence to produce plans and building/wall sections.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Design/Build – Design Submittal Requirements After Award.

2.1.3 OTHER DISCIPLINES:

Interiors, Mechanical, Electrical, Site Mechanical Utilities and Civil are not required in BIM for FY08.

Chapter 3.0 – FY09

3.1 All FY09 project shall meet the following minimum requirements.

3.1.1 INTERIORS:

3.1.1.1 CHARRETTE SUBMITTAL

There are no BIM requirements for this phase.

3.1.1.2 INTERIM SUBMITTAL

a. INTERIOR MODELS

The interior system models may vary in level and detail for individual elements within a model, but the minimum must include all features that would be included on a ¼" to 1'-0" scaled drawing. Additional minimum requirements are listed below.

Furniture Plans – Include in the furniture system model(s) all office and system furniture layouts. System and office furniture shall be completely modeled.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline-specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

3.1.1.3 FINAL SUBMITTAL

a. INTERIOR MODELS

Furniture Plans – Include in the furniture system model(s) all office and system furniture layouts. Model System and office furniture so as to be supported using the Instance Datagroup tool, to accurately quantify piece counts for furniture components that make up the overall furniture package. Extract piece count information from the BIM using the Instance Datagroup tools and export out to an Excel spreadsheet.

b. DRAWING EXTRACTION REQUIREMENTS

Composite Furniture Plans – Provide a composite floor plan if partial floor plans are needed to comply with the requirements for the proper scale. The furniture plans shall match the architectural drawing layouts for sheets. Extract furniture plans from the BIM showing furniture layout for office and system furniture. Re-symbolize the 3D objects to properly identify them.

Component Plans – Extract from the BIM and properly re-symbolize to create the component floor plans. Component plans shall match architectural drawing layouts for sheets.

Panel Floor Plans – Extract from the BIM and property re-symbolize to create the panel floor plans. Panel floor plans shall match the architectural drawing layouts for sheets.

Also see discipline-specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

3.1.2 MECHANICAL – HVAC, PLUMBING, AND FIRE PROTECION:

3.1.2.1 CHARRETTE SUBMITTAL

There are no BIM requirements for this phase.

3.1.2.2 INTERIM SUBMITTAL

a. MECHANICAL MODELS

The Mechanical systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼" to 1'-0" scaled drawing. The systems shall be modeled as they would be built to get complete and accurate quantity takeoffs of relevant construction materials. They shall be complete and accurate to reflect the design intent. Additional minimum requirements are:

HVAC –Include in the model the preliminary layout for the primary pieces of heating, ventilating, and air-conditioning equipment. Include the preliminary air distribution duct layouts for supply, return, ventilation, and exhaust ducts. They shall be accurate enough that all HVAC plans and elevation extractions are accurate to the design intent.

Plumbing – Include in the model(s) the preliminary layouts for all relevant fixtures, floor and area drains, and plumbing equipment, with necessary intelligence to produce the plans, elevations, building/wall sections and schedules. All piping larger than 1.5" diameter shall be modeled.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

3.1.2.3 FINAL SUBMITTAL

a. MECHANICAL MODELS

The Mechanical systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼" = 1'-0" scaled drawing. The systems shall be modeled as they would be built to get complete and accurate quantity takeoffs of relevant construction materials. They shall be complete and accurate to reflect the design intent. Additional minimum requirements are:

HVAC -The model(s) shall include all relevant pieces of heating, ventilating, and air-conditioning equipment. Include the air distribution duct layouts for supply, return, ventilation, exhaust ducts, with necessary intelligence to produce the plans, elevations, building/wall sections and schedules. All piping larger than 1.5" diameter shall be modeled

Plumbing - The model(s) shall include all relevant fixture layouts, floor and area drains, and plumbing equipment, with necessary intelligence to produce the plans, elevations, building/wall sections and schedules. All piping larger than 1.5" diameter shall be modeled.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

3.1.3 ELECTRICAL:

3.1.3.1 CHARRETTE SUBMITTAL

There are no BIM requirements for this phase.

3.1.3.2 INTERIM SUBMITTAL

a. ELECTRICAL MODELS

The Electrical systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼" = 1'-0" scaled drawing. The systems shall be modeled as they would be built to get complete and accurate quantity

takeoffs of relevant construction materials. They shall be complete and accurate to reflect the design intent. Additional minimum requirements are:

Interior Electrical – Include in the model all preliminary lighting, receptacles, telephone outlets, special and general purpose power receptacles and lighting fixtures. Cable tray routing will be modeled without detail of cable contents.

Communications Model – Include all relevant existing communications service connections, and preliminary new communications service connections, both above ground and underground with necessary intelligence to produce the plans.

Exterior Building Lighting Model – Include preliminary locations of proposed exterior lighting with necessary intelligence to produce the plans and elevations.

Electrical Site Model – Include all relevant existing utility lines and preliminary proposed support utility lines and equipment required with necessary intelligence to produce the plans.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

3.1.3.3 FINAL SUBMITTAL

a. ELECTRICAL MODELS

The Electrical systems models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a ¼-in to 1-ft, 0-in. scaled drawing. The systems shall be modeled as they would be built to get complete and accurate quantity takeoffs of relevant construction materials. They shall be complete and accurate to reflect the design intent. Additional minimum requirements are:

Interior Electrical – Include in the model(s) all relevant lighting, receptacles, telephone outlets, special and general purpose power receptacles and lighting fixtures. Model shall also indicate fire alarm/mass notification devices and detection system with necessary intelligence to produce the plans. Cable tray routing will be modeled without detail of cable contents.

Communications Model – Include all relevant existing and new communications service connections, both above ground and underground with necessary intelligence to produce the plans.

Exterior Building Lighting Model – Include all relevant locations of proposed exterior lighting with necessary intelligence to produce the plans and elevations.

Electrical Site Model – Include all relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce the plans.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

3.1.3.4 OTHER DISCIPLINES

Architectural and Structural are to follow the requirements listed in Appendix 3, Chapter 1.

Site Mechanical Utilities and Civil are not required in BIM for FY09.

Chapter 4.0 – FY10

4.1 All FY10 and beyond project shall have the following minimum requirements.

4.1.1 SITE MECHANICAL UTILITIES:

4.1.1.1 CHARRETTE SUBMITTAL

There are no BIM requirements for this phase.

4.1.1.2 INTERIM SUBMITTAL

BIM guidelines have not been determined at this time.

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

4.1.1.3 FINAL SUBMITTAL

BIM guidelines have not been determined at this time.

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

4.1.2 CIVIL:

4.1.2.1 CHARRETTE SUBMITTAL

Using the site survey provide (see Part C Design/Build -- Design Submittal Requirements After Award chapter 2, paragraph "Site Survey") the following model(s) shall be created and submitted:

Digital Terrain Model (DTM) - the DTM will show the new and existing contours together to make-up the overall site model.

The DTM will show roads, parking and building footprint(s) of the approved site and building layouts from the charrette meeting.

All existing utilities need to be indicated in the DTM. The utilities can be placed as simple 2D geometry for this submittal.

Extract all drawings from this model. Also refer to Part C Design/Build -- Design Submittal Requirements After Award, Chapter 1 "All Disciplines" paragraph: Phase II –Charrette Design Meeting And Submittal for drawing deliverables.

4.1.2.2 INTERIM SUBMITTAL

a. CIVIL MODELS

The Civil models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on an appropriately scaled drawing. Additional minimum requirements are listed below.

Digital Terrain Model (DTM) – This model will show existing and new grading contours. This model will also show all existing structures that are remaining. Indicate the new building(s), pavement, drainage inlets, structures, swales and/or detention areas.

Drainage Model – This model will show existing and proposed new piping.

Storm and Sanitary Model – This model will show sewer structures and pipes.

Utility Model – This model will show connection of new utilities from the building to the existing utilities. This model will also show all existing underground utilities along with all new and existing above ground utilities.

Road and Parking Model – This model will show roadway and parking lot facilities. Also existing ground and utilities crossing will be indicated in this model.

Master Site Model – This model will have all civil design models referenced in to create drawing extractions. All drawings shall be extracted form the BIM master model.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

4.1.2.3 FINAL SUBMITTAL

a. CIVIL MODELS

The Civil models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on an appropriately scaled drawing. Additional minimum requirements are listed below.

Digital Terrain Model (DTM) – This model will show existing and new grading contours. This model will also show all existing structures that are remaining. Indicate the new building(s), pavement, drainage inlets, structures, swales and/or detention areas.

Drainage Model – This model will show existing and proposed new piping.

Storm and Sanitary Model – This model will show sewer structures and pipes.

Utility Model – This model will show connection of new utilities from the building to the existing utilities. This model will also show all existing underground utilities along all new and existing above ground utilities.

Road and Parking Model – This model will show roadway and parking lot facilities. Also existing ground and utilities crossing will be indicated in this model.

Master Site Model – this model will have all civil design models referenced in to create drawing extractions. All drawings shall be extracted from the BIM models.

b. DRAWING EXTRACTION REQUIREMENTS

See discipline specific requirements in Part C – Design/Build – Design Submittal Requirements After Award.

4.1.3 OTHER DISCIPLINES:

Architectural, Structural, Interiors, Mechanical, and Electrical are to follow the requirements listed in Appendix 3, Chapters 1 and 2.

ATTACHMENT J

ARMY FACILITIES STANDARDIZATION PROGRAM “TRANSIENT TRAINING OFFICER’S QUARTERS/BARRACKS”



TETRA TECH



**US Army Corps
of Engineers®**



Department of the Army

Facilities Standardization Program

TRANSIENT TRAINING OFFICER'S QUARTERS

Standard Design

Revision 4.8

February 2021

Prepared by:

Center of Standardization (COS)
US Army Corps of Engineers, Honolulu District
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3.0 TRANSIENT TRAINING OFFICERS QUARTERS (TOQ)

3.1 GENERAL REQUIREMENTS

The standard design drawings graphically integrate Army Standard requirements, including net square footage, functional adjacencies, and control zones. The designer of record must utilize regional and climatic criteria to influence the building design.

Functional floor plans and conceptual site plans are provided for this facility in the applicable appendices. Use of these plans for the interior functional arrangement is mandatory. However, the plans may be modified to accommodate local, regulatory, engineering, architectural, life safety, and/or construction requirements at time of proposal. Additional consideration will be given for innovative, creative, or cost-saving proposals which meet or exceed the minimum requirements as established in the RFP.

Minor variations in the basic design forms of the facility types are permissible to accommodate proposed construction processes and materials. Building durability must not be diminished with the use of such systems as compared to the systems and finishes indicated in this package.

Floor and Site plans may change after award with installation and the Center of Standardization (COS) approval to enhance design, comply with codes, or support constructability.

3.1.1 FACILITY DESCRIPTION

- A. TOQ: Each two-story transient training Officer' Quarters (Senior Leaders Quarters) contains forty semi-private senior leader sleeping rooms with baths to accommodate E7-E8 grade personnel.

3.1.2 FACILITY RELATIONSHIPS: (NOT USED)

3.1.3 ACCESSIBILITY REQUIREMENTS:

Officers' Quarters (Senior Leader Quarters) are intended to be occupied by able-bodied personnel only, therefore are not required to be accessible.

3.1.4 BUILDING AREAS:

- A. GENERAL: Area requirements for circulation space and utility rooms area to the discretion of the designer of record in accordance with applicable codes and requirements, counted in the gross square footage for each facility type. Coordinate column spacing and layout with the building floor plans concealing columns within or aligning with walls. Plan column placement to not interfere with the functionality of the space, providing clear spans for the larger open areas shown in the standard design plans.
- B. GROSS AREA: Maximum building gross areas must not be exceeded. A smaller overall gross areas is allowed if all functional relationships in the floor plans and mandated net areas indicated in the building finish schedules are met. Clearly indicate proposed overall building(s) gross area calculation, to include net areas, building gross area, and half scope areas.
- C. HALF SPACE: Half scope areas must be included in the gross area for balconies and porches; overhangs greater than 3'-0" in width, exterior covered loading platforms of facilities, either depressed, ground level, or raised; covered but not enclosed passageways or walks; covered and uncovered but open stairs; and covered ramps.
- D. EXCLUDED SPACE: The following must not be included in the gross building area; Crawl spaces; exterior uncovered loading platforms or facilities, either depressed, ground level, or raised; open paved terraces; roof overhangs and soffits for weather protection 3'-0" or less in width; uncovered ramps; uncovered stoops; and utility tunnels and raceways.

- E. **NET AREA:** The standard floor plans mandate authorized space allowances for the functional areas as indicated on the drawings in the building finish schedules. Net area is measured to the inside face of the functional requirements, overall gross area limitations, and other recognized design principles. If net area requirements are not indicated as mandated, the space must be sized to accommodate the required function, comply with code requirements, and comply with overall gross area.

3.1.5 **ADAPT BUILD MODEL:** (NOT USED)

3.2 **FUNCTIONAL AND OPERATIONAL REQUIREMENTS**

3.2.1 **FUNCTIONAL SPACES – OFFICERS’ QUARTERS (SENIOR LEADERS QUARTERS)**

- A. **GENERAL:** Refer to the Standard Design drawings for minimum net floor areas, space adjacencies, doors, and windows.

The Officers’ Quarters (Senior Leaders Quarters) is a two-story building housing up to 80 senior leaders in 40 living/sleeping rooms. The Officers’ Quarters are sized to accommodate a heavy armor BCT to include the E7 and E8 personnel that cannot be housed in the semi-private Senior Leader Quarters in the Barracks.

Each living module consists of two semi-private rooms. Each room has a bathroom with shower, a sink outside the bathroom, two closets, and a space for two beds. The rooms can be assigned as double or single occupancy consistent with space authorized by grade. Laundry rooms, activity rooms, and vending are available on each floor.

If two Battalion complexes are required, and two Officers’ Quarters (Senior Leaders Quarters) are required, the two buildings may be combined into a single facility. Methods for combining the buildings, including adding stories (requiring an elevator for buildings over two stories), must meet the design criteria set forth in this Standard Design as determined by the COS.

ATFP Building Occupancy Level: The Officers’ Quarters must be considered “billeting” with respect to ATFP requirements.

- B. **PRIMARY SPACES:**

1) **Senior Leaders’ Quarters (SLQ):**

- (a) **Sleeping Rooms:** The two built-in closets in each SLQ must include minimum 3’-0” wide doors. Each sleeping room must include at least one exterior window at 3’-0” above finish floor with blinds. Columns or pilasters along the walls must not be used to allow for an efficient furniture layout.
- (b) **Bath and Sink Areas:** Provide floor mounted toilets with full seats and seat covers. Provide minimum 2’-4” wide bath doors.

- 2) **Laundry Rooms:** Each laundry room must be provided 4 heavy duty clothes washers and 5 heavy duty clothes dryers as part of the FF&E Package which is not in this contract.

- 3) **Common Areas:** These spaces may be used for administration or conferencing. Provide spaces for casual seating to view a wall mounted television in each area. Assure adequate framing is provided to support a large flat screen television for training/briefings as well as entertainment. The television and mounting bracket must not be in the contract since it will be GFGI. Provide space for tables with seating.

Within the common area on the second floor, provide a kitchenette with space for a refrigerator/freezer as part of the FF&E, which is not part of this contract, stainless steel double

basin sink, and space for a microwave oven, which will be provided by others. Provide base and wall cabinets, 8'-0" minimum length.

C. COMMON AND UTILITY AREAS:

- 1) **Vestibule:** Provide an enclosed transition space between the exterior and lobby. Include a clearance between doors to accommodate a 10'-0" long walk-off grate to meet LEED credit requirements.
- 2) **Corridors:** Minimum corridor width is 5'-0".
- 3) **Stairs:** Provide circulation to the second floor near the front entrance and at the end of the corridor. Both stairs must be enclosed with windows included for light and view. The Installation may choose to use a covered, open stair at the end of the second floor corridor in lieu of an enclosed stair.
- 4) **Storage Rooms:** Provide a storage room on each floor, including full built-in adjustable shelving.
- 5) **Janitor's Closets:** Provide floor mop sink on each floor including service faucet with hose and bracket, mop rack, and floor drain.
- 6) **Mechanical, Electrical, and Telecommunications Rooms:** Size and locate utility rooms to allow equipment removal and maintenance. The second floor mechanical room must include an interior access door and double exterior doors (or removable louver) for equipment replacement. The main electrical room must be located on the first floor. Provide a single out swinging interior door with panic hardware for the electrical rooms when required by code. Provide dedicated interior rooms for telecommunications equipment, minimum 8'x10' on the first floor and minimum 6'x8' on the second floor.
- 7) **Vending/Recycle Areas:** Include space for one full size soft drink and one full size snack vending machine on each floor, which will be provided by others. Provide space and appropriate utilities for a GFGI ice machine, included in the FF&E Package. Provide space for five recycle bins to meet LEED credit requirements.
- 8) **Bootwashes:** Provide bootwashes at the two exterior entries. Bootwashes must accommodate boot washing, drainage, and grit/dirt removal. Each boot wash facility must include minimum two freeze-proof hose bibs, removable bar grating for sediment clean-out, mounted boot brushes, and drying rack/handrail. Coordinate bootwash drainage requirements with the Installation.

3.3 **SITE FUNCTIONAL REQUIREMENTS**

A. PARKING:

- 1) Provide paved and striped parking for privately owned vehicles (POV) as shown in the provided site layout in accordance with the Installation's requirements. Site layout includes handicap accessible parking spaces near buildings required to be handicap accessible 20 parking spaces to accommodate occupants for the Officers' Quarters (Senior Leaders Quarters).

B. ACCESS DRIVES AND LANES:

- 1) **Service Drives:** Provide service drives to each building for access to the mechanical room location. Restrict access as required for ATPF and the Installation. Service drives must be minimum 10 feet wide.

- 2) **Emergency Vehicle/Fire Access Lanes:** Provide fire access to each building as required by UFC 3-600-01 with access restricted as required for ATFP and the Installation. Required fire access lanes designed for emergency vehicle loads and widths must also be used as sidewalks. When Officers' Quarters are included, assure that access for fire trucks complies with fire protection requirements with access on three sides, including both long sides, of Officers/ Quarters (Senior Leader Quarters) within 33 feet or as determined by the Installation Fire Chief.

3.2.2 **SITE AND LANDSCAPE REQUIREMENTS**

A. **SITE STRUCTURES:**

- 1) **Dumpster Enclosures:** Provide screened or enclosed dumpster areas, architecturally compatible with the buildings served and as required by the Installation. Enclosures must be sized to the required number of dumpsters and recycle containers. Located dumpsters in accordance with ATFP standoff distance requirements.
- 2) **Service Yards:** Provided mechanical equipment enclosures, sized to allow clearances for maintenance as required by the equipment manufacturer. Locate enclosures in accordance with ATFP standoff distance requirements. Where top protection is required in accordance with ATFP requirements, assure adequate height is provided for maintenance without removal of top protection. Design top screening for removal in easily handled sections.
- 3) **Utility Pads:** Provided concrete exterior utility pads for any mechanical or utility device needed for the building operation. Include all necessary piping, wiring, or utility extensions for the device to function as designed. Locate mechanical equipment near existing or proposed sidewalks, access drives, or parking areas to eliminate the need to construct additional accesses.
- 4) **Bollards:** Provide 5-foot high, concrete-filled, schedule 80 galvanized steel pipe bollards, painted safety yellow at overhead motorized coiling/roll-up or sectional doors and adjacent to the service yards and building corners where frequent nearby vehicle movement increased the risk of damage by vehicle impact. Provide bollards 5 feet from the edge of electrical and mechanical equipment. Bollards must include concrete footings designed to withstand organization vehicular impact. Minimum required bollards are shown in the floor plans. Provide 6-inch diameter bollards.

B. **LANDSCAPING/HARDSCAPING:**

- 1) **Pedestrian Sidewalks:** Provide minimum 6-foot wide sidewalks connecting each building entrance with parking areas, other buildings in the complex, and as needed for fire exiting and site circulation..
- 2) **Landscaping:** Minimal landscaping must be provided as required by the Installation. All other areas must be seeded in lawn grasses acceptable to the climate and Installation. Landscape with materials indigenous to the area, eliminating requirements for irrigation and minimizing maintenance. Reference Installation planting lists.

3.5 **ARCHITECTURAL REQUIREMENTS**

- A. **GENERAL:** Provide durable and easily maintainable materials. Do not use exterior materials that require periodic repainting or refinishing processes. Material exposed to weather must be factory finished, integrally colored, or provided with intrinsic weathering finish.
- B. **ROOF ACCESS:** Provided lockable roof access hatches at the top of stairs as required by UFC 3-600-01 and Code for buildings over three stories. Include ladder, top ladder extension, and lockable ladder guard for each roof access.

C. **MINIMUM FINISH REQUIREMENTS:** Where concrete masonry units (cmu) are required as the room finish in the drawings on the finish schedules for Officer Quarters, alternative high impact finishes may be used, including high impact gypsum board and high impact plaster coating. Impact resistance must be as approved by the Installation.

D. **EXTERIOR OPENINGS:**

- 1) **Storefronts (Main Entrances):** Provide aluminum storefront doors and frames with Architectural Class 1 anodized finish, fully glazed with insulating glass units, having medium or wide stiles for entry into lobbies or corridors. Framing systems must have thermal-break design. Storefront systems must comply with wind load requirements of applicable codes and criteria including UFC 4-010-01.
- 2) **Windows:** The number of windows shown on the drawings illustrate the minimum number of windows required with the intent to include additional windows to balance building elevation aesthetics or achieve more day lighting or views. Provide insulated glass units in high efficiency window systems with thermally broken frames complying with applicable codes and criteria including UFC 4-010-01. Window sills must be designed for drainage and discouraging bird nesting. Where operable windows are used, aluminum framed insect screens must be provided. Window operability must be determined by the Installation.
- 3) **Exterior Doors and Frames:** All exterior doors must be minimum 3'-0" wide, including those used in double door openings.
 - a) **Exterior Insulated Hollow Metal Doors & Frames:** Provide insulated hollow metal exterior doors for entry to all spaces other than corridors or lobbies. Doors must be minimum Level 3, physical performance Level A, Model 2 flush, seamless. Frames must be Level 4, 12-gauge, with continuously welded mitered corners and seamless face joints. Doors and frames must be A60 galvanized, in compliance with ASTM A653 and must be factory primed for field paint.
 - b) **Exterior Overhead Doors:** Overhead doors, where required, must be insulated, motorized, coiling/roll up or sectional doors with factory finish.
- 4) **Hardware:**
 - a) **Door Hardware:** All door hardware must be Grade 1 for heavy duty use. Keying must be coordinated with the Installation. Cores must have not less than seven pins; cylinders must have key-removable type cores.
 - b) **Electronic Access System:** When the Installation requires electronic access, all main entry doors must be included.

E. **INTERIOR REQUIREMENTS:**

- 1) **Interior Doors:** All interior doors must be minimum 3'-0" wide, including those used in double door openings.
 - a) **Interior Wood Doors:** All interior doors for all facility types must be solid core wood unless otherwise indicated. Provide flush solid core wood doors conforming to WDMA I.S.-1A. Stile edges must be non-finger jointed hardwood compatible with face veneer. Provide Architectural Woodwork Institute (AWI) Grade A hardwood face veneer for transparent finished doors.
 - b) **Interior Insulated Hollow Metal Doors:** When indicated for use, hollow metal; doors for interior use must be factory primed and comply with ANSI A250.8/SDI 100. Doors must be minimum Level 2, physical performance Level B, Model 2, flush, seamless.

- c) **Interior Hollow Metal Frames:** All interior door frames must be hollow metal unless otherwise indicated. Interior hollow metal frames must be factory primed and comply with ANSI A250.8/SDI 100. Frames must be minimum Level 2, 16 gauge, with continuously welded mitered corners and seamless face joints.

F. **ACOUSTICAL REQUIREMENTS:**

- 1) **Sound Transmission Reduction:** Provide STC rated wall and door assemblies between spaces with minimums as shown on the drawings.
- 2) **Room Noise Criteria and Testing:** Building construction and installed equipment must accommodate room noise criteria limits.
 - a) **Room Criteria (RC):** Occupancy classification establishes acceptable background sound in rooms over the frequency range of 16 Hz to 4000 Hz, particularly measuring rumbling, rattling, buzzing, hissing, and humming from building mechanical and electrical systems. Rooms must not exceed the Room Criteria (RC) indicated below. All RC ratings must be neutral (N). Designers of Record must determine adequate construction requirements to achieve the following RC limits:

Open Offices:	RC 35 (N)
Private Offices:	RC 30 (N)
Conference Rooms:	RC 25 (N)
Sleeping Rooms/Bays:	RC 25 (N)
Common Rooms:	RC 25 (N)
 - b) **RC Testing:** Test all rooms with all building systems operating, including air compressors. Measure the sound pressure level in dB referenced to 20 micro Pascals. Report the results of the tests by plotting the sound pressure level in each octave band from 32-4000 Hertz on Room Criterion Curve sheets published by ASHRAE. Provide an individual plot for each room and a narrative discussion explaining the test results. Rooms exceeding the above RC must have either systems or sound attenuation altered until the RC rating is met.

3.5.1 **FINISHES AND INTERIOR SPECIALTIES**

- A. **GENERAL:** Minimum interior finishes must be as indicated in the finish schedules for each facility type on the drawings. Higher grade finishes may be proposed, however, due to durability issues with these transient facilities, may not be acceptable.
- B. **INTERIOR FINISHES:**
 - 1) **Walls:** All gypsum board must achieve a score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method. Gypsum board wall finish must be minimum Level 4 or 5 finish in accordance with GA 214.
 - 2) **Countertops/ Vanities:** Provide solid polymer countertops/vanities and integral backsplashes. Include 4 inch solid polymer skirts for vanities and waterfall edges for countertops.
 - 3) **Window Stools:** Provide solid polymer window sills.
- C. **INTERIOR SPECIALTIES:**
 - 1) **Signage & Directories:** Provide a comprehensive signage package for each facility including changeable directories, way-finding signage, and room signage with room numbers and changeable room names.

- 2) **Restroom, Bath, and Shower Accessories:** Provide commercial grade, heavy duty toilet accessories with metal finish. (Type 304 stainless steel when available.) Coordinate for toilet accessories that may be provided by an Installation's maintenance contract.
- 3) **Wall Protection:**
 - a) **Chair Rail:** Provide chair rails in areas prone to chair height impacts including conference rooms, waiting areas, and common use areas.
 - b) **Corner Guards:** Provide surface mounted, high impact resistant, integral color, snap-on type resilient corner guards, extending from floor to ceiling for all column outside corners in high traffic areas such as corridors, waiting areas, lobbies, conference and common use rooms. Factory fabricated end closure caps must be provided for top and bottom of corner guards.
- 4) **Janitor's Closet:** Provide floor mop sink where shown in each facility with 4'-0" high stainless steel, tile, or solid polymer backsplash, service faucet with hose and bracket, mop rack for three mops, minimum 6'-0" of linear stainless steel shelving capable of supporting minimum 30 lb. per linear feet, and floor drain.
- 5) **Clothes Closets:** Provide a wire shelf the width of the closet with hanger bar capable of supporting minimum 30 lb. per linear foot in each clothes closet in senior leaders' quarters.
- 6) **Restrooms:** Provide vanity light fixtures above glass mirror for length of the vanity in each restroom. Provide a solid polymer countertop with integrally molded lavatories, minimum 16"x12", and 6" high coved back and side splash. The number of fixtures shown in the facility type plans must be considered the minimum requirement.
 - a) **Men's Restrooms:** Urinals must be wall hung. Provide floor mounted, 3/4-inch solid polymer toilet partitions and urinal screens, toilet tissue dispensers, liquid soap dispensers, paper towel dispensers, coat hooks, and waste receptacles.
 - c) **Women's Restrooms:** Provide floor mounted, 3/4-inch solid polymer toilet partitions, toilet tissue dispensers, napkin disposals, liquid soap dispensers, paper towel dispensers, coat hooks, and waste receptacles.
- 7) **Senior Leaders' Quarters Bath and Sink Area:** Provide a minimum 3'-0" wide solid polymer countertop with integral sink in each SLQ with base cabinet having hinged door(s). Provide one, minimum 3'-0" x 3'-0" fiberglass shower unit in each bathroom with curtain, curtain rod, and integral soap shelves. Towel pins and toilet tissue dispensers must be provided in each bath and sink area.
- 8) **Laundry rooms:** Provide a custom solid polymer clothes folding table with clothes rod above.
- 9) **Storage rooms:** Provide full built-in adjustable shelving with capability of supporting minimum 30 lb. per linear foot.
- 10) **Common area, second floor:** Provide a kitchenette, 8'-0" minimum length with base and wall cabinets and double stainless steel kitchen sink and gooseneck faucet.

3.6 STRUCTURAL REQUIREMENTS:

- A. **GENERAL:** System design and construction must meet all applicable criteria identified herein.
- B. **BUILDING CATEGORY (based on 2009 criteria per UFC 1-200-01)**
 Officers Quarters: II
- C. **SEISMIC IMPORTANCE FACTOR (IE)**
 Officers Quarters: 1.0

3.7 NOT USED

3.8 **PLUMBING REQUIREMENTS**

- A. GENERAL: System design and construction must meet all applicable criteria identified herein.
- B. DOMESTIC WATER:
 - 1) **Water Service**: The domestic water service to the building must enter the building in the mechanical room. The water service must be provided with a reduced pressure backflow preventer to isolate each building from the base water system. A main shut-off valve must be provided inside each building, coordinate location with the Installation.
 - 2) **Water Distribution**: A horizontal water distribution system must serve the building, with isolation valves at each branch to common areas serving two or more fixtures, and at each wall hydrant or equipment connection. Water connections for mechanical equipment systems make-up will be isolated from the domestic water system with a reduced pressure backflow preventer.
- C. SANITARY SYSTEM: A sanitary drain, waste and vent system will extend from the connection to the site utility system to all fixtures and equipment requiring service. Drainage and vent stacks must extend vertically and be vented through the roof. Trap primers must be provided for drains susceptible to loss of water seal by evaporation.
- D. FLOOR DRAINS: Floor drains must be provided in mechanical rooms, janitor rooms, vending machine areas, restrooms, laundries, and for equipment requiring drainage. All floor drains must be automatically primed by single trap primers.
- E. WALL HYDRANTS: Wall hydrants must be provided at a maximum spacing interval of 150 feet around the perimeter of the building. Wall hydrants must be box type, freeze-proof, with integral vacuum breaker/backflow preventer.
- F. WATER HAMMER ARRESTERS: Water hammer arresters will be provided for shock suppression. The placement of water hammer arresters must be as referenced in the IPC.
- G. GAS DISTRIBUTION: The design and installation of interior natural gas distribution systems must be in accordance with manufacturer's recommendations and the applicable sections of ASME B31.8, NFPA 54.
- H. LOBBY: Provide one standard electric water cooler in the lobby on each floor.
- I. LAUNDRY: Each laundry must include one solid polymer utility sink with gooseneck faucet and a floor drain. Water and sanitary lines must be provided to accommodate the washers and utility sink.
- J. LIVING/SLEEPING ROOM BATH: Locate shower heads such that spray is directed at opposite wall and not shower curtain.
- K. VENDING AREA: Provide adequate water supply for the ice machine.
- L. COMMON AREA: Within the counter, provide stainless steel double basin sink with gooseneck faucet. Provide adequate water supply for refrigerator ice maker.

3.9 COMMUNICATIONS AND SECURITY SYSTEMS

- A. GENERAL: System design and construction must meet all applicable criteria identified herein.
- B. TELECOMMUNICATIONS SYSTEMS:
 - 1) **Connectivity**:
 - a) **Officers Quarters, Senior Leader Quarters (SLQ)**: Provide each SLQ sleeping room with a single 8P8C voice outlet.

- b) **Officers Quarters, Common Areas:** Provide data/internet ports along walls and for television.
 - c) **Utility Rooms:** Provide each utility room with at least one wall phone outlet located near the entrance door including mechanical, electrical, and telecommunications rooms.
- 2) **CATV:**
- a) **Officers Quarters, Senior Leader Quarters (SLQ):** Provide each SLQ sleeping room with one CATV outlet.
 - b) **Officers Quarters, Common Areas:** Provide CATV for television.
- C. AUDIO/VISUAL SYSTEMS & INFRASTRUCTURE:
- 1) **Projectors:** Provide power where projectors will be installed. Projectors are GF&I by the Installation, not included in the FF&E Package.
 - 2) **PA Systems:** Provide power and conduit with pull wire where public address (PA) systems will be installed. PA systems are GF&I by the Installation, not included in FF&E Package.
- D. SECURED COMMUNICATIONS: (NOT USED)
- E. SECURED INFRASTRUCTURE/SYSTEMS: (NOT USED)

3.10 **ELECTRICAL REQUIREMENTS:**

- A. **GENERAL:** System design and construction must meet all applicable criteria identified herein.
- B. **INTERIOR ELECTRICAL SYSTEM:**
 - 1) **Transient Voltage Surge Suppression (TVSS):** Transient voltage surge suppression (TVSS) must be provided for all buildings. TVSS devices must parallel the operating devices in providing a path to ground for an electrical surge and thereby limiting the magnitude of the transient voltage surges on the system. TVSS devices must be mounted adjacent to or integral with the main distribution panel in accordance with the manufacturer's recommendation. TVSS devices must be hard wired into the electrical distribution system utilizing a circuit breaker connection. TVSS units must be tested in accordance with IEEE C62.45 using IEEE C62.41 Category B waveform. Units must be UL 1449 listed and labeled. The modes of protection must be the normal mode (L-N, L-L) and common mode (L-G, N-G). TVSS units must include self-diagnostic and self-testing capabilities, a resettable transient event counter, and a local audible alarm with mute capability.
 - 2) **Receptables:** Receptacles must be provided adjacent to all CATV and data jack locations.
 - 3) **Spare Capacity:** All switchboards, panelboard, load centers, and feeders must be designed with 15% spare capacity for future additions and changes.
- C. **EXTERIOR LIGHTING SYSTEM:** Exterior lighting systems must be provided in accordance with the site design contract. Areas include sidewalks, roadways, service yards, facility aprons, open storage areas, and parking areas. Poles located within the service yards, facility aprons, and hardstand parking areas must be located and protected to minimize damage from vehicles. Building mounted light fixtures may be used around the building perimeter to supplement pole mounted light fixtures. Coordinate the control of the exterior lighting with the Installation.
- D. **INTERIOR LIGHTING SYSTEM:**
 - 1) **Security Lighting:** Security lighting must be provided at service entrances and at utility rooms. Wall mounted security lighting fixtures must be shrouded to minimize glare.
 - 2) **Exit and Emergency Lighting:** Illuminated exit signs and egress/emergency lighting must be provided by self-contained emergency battery units for all emergency exits and passageways as required by NFPA 101. Exit signs must be LED type, letter color in accordance with Installation. If installed on a switched circuit, emergency lighting must be configured so that the emergency lamp is illuminated regardless of the position of the control switch.
 - 3) **Sensors:** Occupancy sensors (auto on with movement and auto off with no movement) must be utilized for lighting control in the public restrooms, latrine/showers and all vertical/horizontal circulation spaces. All other spaces must be provided with vacancy sensors (manual on or manual off and auto off with no movement).
- E. **GROUNDING:** Grounding points must be provided on 40-foot centers (maximum) and coordinated with the parking layout. Provide a minimum of one grounding point for every eight vehicles parked in a double row, and one grounding point for every four vehicles parked in a single row configuration.

3.11 **HEATING VENTILATING AND AIR-CONDITIONING (HVAC) REQUIREMENTS:**

- A. **GENERAL:** System design and construction must meet all applicable criteria identified herein.
- B. **HVAC DESIGN CONDITIONS:**
 - 1) **Outdoor Design Temperature, Cooling:** The outdoor design temperature for comfort cooling must be the 1% dry bulb and the corresponding wet bulb temperature for the locale or the 1% dehumidification dewpoint temperature and the corresponding dry bulb temperature, whichever produces the greater cooling load.

- 2) **Outdoor Design Temperature, Heating:** The outdoor design temperature for heating must be the 99% dry bulb temperature for the locale.
- 3) **Indoor Design Temperature, Cooling:** The indoor design temperature for comfort cooling must be 15 degrees F less than the 1% outdoor air temperature, but will be no lower than 75 degrees F, nor any greater than 78 degrees F.
- 4) **Indoor Design Temperature, Heating:** The indoor design temperature for comfort heating must be 68 degrees F. Winter humidification must be required where the indoor relative humidity is expected to fall below 20%.
- 5) **Indoor Design, Humidity:** The indoor design relative humidity must be 50%.

3.12 ENERGY CONSERVATION REQUIREMENTS: The building, including the building envelope, HVAC systems, service water heating, power, and lighting systems must meet the mandatory provisions and the prescriptive path requirements of ASHRAE 90.1.

Design the building including the building envelope, HVAC systems, service water heating, power and lighting systems to achieve a non-plug load energy performance that is at least 40% below the consumption of a baseline building meeting the minimum requirements of ANSI/ASHRAE/IESNA 90.1-2007. Plug/Process loads must be included in the building energy modeling but are subtracted in the final calculation for Energy Performance (Examples of Plug or Process loads are computers, elevator, and food service equipment).

3.13 FIRE PROTECTION CRITERIA:

- A. **GENERAL:** System design and construction must meet all applicable criteria, using the most stringent in case of conflict. All facility types require full protection throughout by an automatic sprinkler system in accordance with NFPA and UFC documents. Suggested use and occupancy classifications are as follows:
 - 1) **OFFICERS QUARTERS:** IBC, Group R-1 (Residential Transient). NFPA 101, New Hotels & Dormitories.
- B. **FIRE PUMP:** A fire pump or fire booster pump must be provided if required, based on the available flow and pressure. (Prior to award, contractors must use the flow test data provided. After award, designer of record must be responsible for performing a hydrant flow test.) Data from this test must be used as the basis for design as indicated above for automatic sprinkler protection. When a fire pump is required, an additional room must be created, preferably within or near the mechanical room, changing the building floor plan without adding to the total floor area. These changes must be made during design and will require COS approval.
- C. **FIRE DETECTION AND ALARM SYSTEMS:** In the following spaces, smoke detection devices must be individually monitored and addressed. Tampering with a smoke detector must transmit a trouble signal to the Fire Department. A smoke detector with sounder must be provided. The fire alarm system must be programmed so that the activation of the smoke detector must activate the sounder in the sleeping room, but must be connected to the FACP for supervision only and must not activate the general alarm.
 - 1) Officers' Quarters, Senior Leaders Quarters and Sleeping Bays.

3.14 EQUIPMENT AND FURNITURE REQUIREMENTS:

3.14.1 FURNISHINGS: Reference the furniture layouts on the drawings and the specific requirements in this section.

3.14.2 EQUIPMENT: Reference the furniture layouts on the drawings and the specific requirements in this section.

3.15 FACILITY SPECIFIC REFERENCES: (NOT USED)

ATTACHMENT A: STANDARD DESIGN DRAWINGS

All Drawings are in compliance with Army Standard (AS) and the USACE A/E/C CADD Standards.

OFFICERS QUARTERS: TRANSIENT TRAINING

A-101 OFFICERS QUARTERS FIRST FLOOR PLAN
A102 OFFICERS QUARTERS SECOND FLOOR PLAN

ATTACHMENT K

RFP DRAWINGS (submitted separately)



TETRA TECH

ATTACHMENT L

PROJECT AUTHORIZATION DOCUMENTS
(INCLUDES DD FORM 1390S/1)



TETRA TECH



**STATE OF DELAWARE
DELAWARE ARMY NATIONAL GUARD
1197 RIVER ROAD
NEW CASTLE, DELAWARE 19720**



NGDE-ARI-ENV

23 September 2020

MEMORANDUM FOR Facilities Management Office

**SUBJECT: Bethany Beach Transient Training Officers Barracks (Project # 100103)
Record of Environmental Consideration (REC) Transmittal Memorandum**

1. The Environmental Office has completed a REC checklist for the following project: Bethany Beach Transient Training Officers Barracks. The project is described as: A standard design Transient Training barracks of permanent construction. The barracks includes the following items that are integral for facility; comprehensive interior design services are requested. This facility will be designed to meet Industry Standards as well as all local, State, and federal building codes. Construction will include all utility services, information systems, fire detection and alarm systems, roads, walks, curbs, gutters, storm drainage, parking areas, and site improvements. Facilities will be designed to a minimum life of 50 years in accordance with DoDs Unified Facilities Code (UFC 1-200-02) including energy efficiencies, building envelope and integrated building systems performance as per ASA (IE&E) Sustainable Design and Development Policy Update 2017. Access for individuals with disabilities will be provided. Anti-terrorism measures in accordance with the DoD Minimum Antiterrorism for building standards will be provided.

2. The following references were used during the analysis:

- a. Threatened and Endangered Species List, State of Delaware, U.S. Fish and Wildlife, concurrence dated 23 September 2020 (enclosed).
- b. DEARNG Final Integrated Cultural Resources Management Plan (ICRMP), 2020.

3. The following conclusions support the referenced REC checklist items for issues that are specific to the Bethany Beach Transient Training Officers Barracks project:

- a. Checklist Item #1. Is this action segmented (the scope of the action must include the consideration of connected, cumulative, and similar actions)? Response: no.
- b. Checklist Item #2. Is there reasonable likelihood of significant environmental effects (direct, indirect, and cumulative)? Response: no.
- c. Checklist Item #3. Is there a reasonable likelihood of significant effects on public health, safety, or the environment? Response: no.

NGDE-ARI-ENV

SUBJECT: Bethany Beach Transient Training Officers Barracks (Project # 100103)
Record of Environmental Consideration (REC) Transmittal Memorandum

d. Checklist Item #6. Will there be reportable releases of hazardous or toxic substances as specified in 40 CFR Part 302? Response: No. Construction contract will adequately address this issue.

e. Checklist Items #13-15. These checklist items refer to Endangered Species Act requirements. Response: A current threatened and endangered species list is attached, dated 23 September 2020. There are no threatened or endangered species currently at this project site.

f. Checklist Items #18-26. These checklist items refer to requirements of the National Historic Preservation Act. Response: Project is for new building construction. There are no issues from a historic standpoint. See attached SHPO concurrence.

g. Checklist Item #27. Does the project involve an unresolved effect on areas having special designation or recognition such as those listed below? Response: No.

4. The scope of the REC is based on the following assumptions:

a. This project will not generate significant quantities of hazardous waste.

5. The REC assumes the following mitigation measures are incorporated into the project execution:

a. Potential lead and asbestos will be remediated and properly disposed if encountered during project execution.

b. The use of chemical fire suppressants will be coordinated with environmental, safety, and occupational health.

6. The proponent is responsible for obtaining all appropriate permits and conducting any required coordination with Federal, state, and local government agencies.

7. The proponent is responsible for complying with all Federal, state, and local regulations applicable to the execution of this project.

8. The point of contact for this memorandum is the undersigned and can be reached at 302-326-7489 or brian.s.nichols2.nfg@mail.mil.



BRIAN S. NICHOLS
DEARNG
Environmental Program Manager

Encl

Enviro Tracking #:	ARNG ENVIRONMENTAL CHECKLIST	State ARNG
	Enter information in the yellow shaded areas.	DE
PART A - PROJECT INFORMATION		
1. PROJECT NAME: Bethany Beach Training Site Transient Training Officers Quarters		
2. PROJECT NUMBER: (MILCON if applicable) 100103	3. DATE PREPARED: 1 September 2020	
4. DESCRIPTION AND LOCATION OF THE PROJECT/PROPOSED ACTION: a. Location (Include a detailed map, if applicable): 163 Scannell Blvd, Bethany Beach, DE		
b. Description: A standard design Transient Training barracks of permanent construction. The barracks includes the following items that are integral for facility; comprehensive interior design services are requested. This facility will be designed to meet Industry Standards as well as all local, State, and federal building codes.		
c. The proposed action will involve (check all that apply):		
<input type="checkbox"/> Training activities/areas <input checked="" type="checkbox"/> Construction <input type="checkbox"/> Natural resource management <input type="checkbox"/> Maintenance/repair/rehabilitation <input type="checkbox"/> Real estate action <input type="checkbox"/> Environmental plans/surveys <input type="checkbox"/> Innovative readiness training project <input type="checkbox"/> Other (Explain):		
d. Project size (acres): (if applicable)	n/a	Acres of new surface disturbance (proposed): (if applicable)
		n/a
5. START DATE of PROPOSED ACTION (dd-mmm-yy): 15-Nov-2020		Note: This must be a future date.
6. PROGRAMMED FISCAL YEAR (if applicable): FY21		
7. END DATE (if applicable): FY25		
PART B - DECISION ANALYSIS GUIDE		
To use a categorical exclusion, the project must satisfy the following three screening criteria: no segmentation, no exceptional circumstances and a qualifying categorical exclusion that covers the project. The following decision tree will guide the application and documentation of these three screening criteria. The criteria were extracted from 32 CFR Section 651.29 and represent the most common screening conditions experienced in the ARNG. NOTE: Each question in Part B must have an applicable block checked for concurrence with REC.		
1. Is this action segmented (the scope of the action must include the consideration of connected, cumulative, and similar actions)?		
<input type="checkbox"/> YES (go to #30) <input checked="" type="checkbox"/> NO (go to #2)		
2. Is there reasonable likelihood of significant environmental effects (direct, indirect, and cumulative)? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.		
<input type="checkbox"/> YES (go to #30) <input checked="" type="checkbox"/> NO (go to #3)		
3. Is there a reasonable likelihood of significant effects on public health, safety or the environment? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.		
<input type="checkbox"/> YES (go to #30) <input checked="" type="checkbox"/> NO (go to #4)		
4. Is there an imposition of uncertain or unique environmental risks? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.		
<input type="checkbox"/> YES (go to #30) <input checked="" type="checkbox"/> NO (go to #5)		
5. Is the project of greater scope or size than is normal for the category of action? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.		
<input type="checkbox"/> YES (go to #30) <input checked="" type="checkbox"/> NO (go to #6)		
6. Does the project introduce or employ unproven technology? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.		
<input type="checkbox"/> YES (go to #30) <input checked="" type="checkbox"/> NO (go to #7)		

PART B - DECISION ANALYSIS (continued)

7. Will there be reportable releases of hazardous or toxic substances as specified in 40 CFR Part 302? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

- YES (go to #30) NO (go to #8)

8. If proposed action is in a non-attainment or maintenance area, will air emissions exceed de minimus levels or otherwise require a formal Clean Air Act (CAA) conformity determination? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

- YES (go to #30) NO (go to #9) NA (go to #9)

9. Will the project have effects on the quality of the environment that are likely to be highly controversial? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

- YES (go to #30) NO (go to #10)

10. Will the project establish a precedent (or make decisions in principle) for future or subsequent actions that are reasonably likely to have future significant effects? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

- YES (go to #30) NO (go to #11)

11. Has federal funding been secured for the Innovative Readiness Training (IRT) project?

- N/A (go to #13) YES (go to #13) NO (go to #12)

12. NOTE: IRT projects not currently funded can secure approved NEPA documentation. However, once funding is secured State ARNG is required to coordinate with ARNG-ILE-T to complete natural and cultural surveys via proponent funding.

- CONFIRMED (go to #27)

13. Do you have a species list from the U.S. Fish and Wildlife Service that is less than 90 days old?

- YES (go to #14) **Date of List: 23 Sep 2020** NO (update species list return to #13)

14. In reviewing the species list, what determination was made by the State ARNG?

- No species present (go to #16)
 No affect (go to #16)
 May affect but not likely to adversely affect (go to # **Date of USFWS concurrence:**)
 May affect likely to adversely affect (go to #15)

15. Does an existing Biological Opinion cover the action?

- YES (go to #16) **Date of BO:** NO (go to #30)

16. Have the Endangered Species Act, Section 7 requirements completed?

- YES (go to #17) **Date of Documentation: 23 Sep 2020** NO (complete documentation, return to #16)

17. Does the project involve an undertaking to a building or structure that is 50 years of age or older?

- YES (go to #18) NO (go to #20)

18. Has the building or structure been surveyed for the National Register of Historic Places?

- YES (go to #19) NO (complete inventory, return to #18)

19. Is the building or structure eligible for or listed on the National Register of Historic Places?

- YES (go to #20) NO (go to #20)

20. Does the action involve ground disturbing activities?

- YES (go to #21) NO (go to #22)

21. Has an archaeological inventory or research been completed to determine if there are any archeological resources present?

- YES (go to #22) NO (complete inventory or conduct research, return to #21)

22. In reviewing the undertaking, under the National Historic Preservation Act (NHPA) (for both above and below ground resources), what determination was made by the State ARNG?

- No 106 undertaking; no additional consultation required under NHPA (go to question #27)
 No properties affected (go to #24) **Date of SHPO Concurrence:**
 No adverse effect (go to #24) **Date of SHPO Concurrence:**
 Adverse effect (go to #23)

23. Has the State ARNG addressed the adverse effect?

- YES (place date of MOA or existing PA and explanation of mitigation in box below, go to #24) NO (go to #30)

23a.

PART B - DECISION ANALYSIS (continued)

24. Per DoDI 4710.02 did the state ARNG determine that tribal consultation was necessary for this project?

- YES (go to #25)
 NO (Provide reason in this block 24a, go to #27)

24a.

25. Did the Tribes express an interest or respond with concerns about the project?

- YES (go to #26) NO (go to #27) Date of Documentation:

26. Has the State ARNG addressed the Tribal concerns?

- YES (place date of MOU or explanation of how State ARNG addressed tribal concerns in box below, go to #27)
 NO (address concerns, return to #26)

Complete only if additional documentation is required in question #26

26a.

27. Does the project involve an unresolved effect on areas having special designation or recognition such as those listed below? For any yes responses go to #30 otherwise go to #28. If any No response is a result of negotiated and/or previously resolved effects please describe resolution in box 27a below.

TYPE	Unresolved Effects?	TYPE	Unresolved Effects?
a. Prime/Unique Farmland	no	e. Wild/Scenic River	no
b. Wilderness Area/National Park	no	f. Coastal Zones	no
c. Sole-Source Aquifer	no	g. 100-year Floodplains	no
d. Wetlands	no	h. National Wildlife Refuges	no

27a.

28. Is this project addressed in a separate EA or EIS review?

- YES (complete table below; go to Part C, Determination) NO (go to #29)

Document Title:	Delaware Army National Guard Bethany Beach Regional Training Institute Construction, Operation, and Associated Demolition
Lead Agency:	
Date of Decision Document:	February 2013

29. Does the project meet at least one of the categorical exclusions listed in 32 CFR 651 App B?

- YES (complete table below; go to Part C, Determination) NO (go to #30)

List primary CAT EX code	C-1: Construction of an addition to an existing structure or new...
Describe why CAT EX applies	This CAT EX is applicable as this project is a new military construction project.

30. At this time your project has not met all the qualifications for using a categorical exclusion under 32 CFR 651. Unless the scope of the project is changed, it will require an Environmental Assessment or possibly an Environmental Impact Statement. If you feel this is in error, please call your NEPA Regional Manager to discuss. If needed, go to Part C Determination.

Additional Information (if needed):

PART C - DETERMINATION

On the basis of this initial evaluation, the following is appropriate:

- IAW 32 CFR 651 Appendix B, the proposed action qualifies for a Categorical Exclusion (CX) that does not require a Record of Environmental Consideration.
- A Record of Environmental Consideration (REC).
- An Environmental Assessment (EA).
- A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS).

Signature of Proponent (Requester)

Environmental Program Manager

Mr. William F. Cost

Printed Name of Proponent (Requester)

Mr. Brian S. Nichols

Printed Name of Env. Program Manager

Date Signed

Date Signed

Other concurrence (as needed):

Signature

Signature

Printed Name

Printed Name

Date Signed

Date Signed

Signature

Signature

Printed Name

Printed Name

Date Signed

Date Signed

Signature

Signature

Printed Name

Printed Name

Date Signed

Date Signed

Enviro Tracking #:	ARNG Record of Environmental Consideration		State ARNG		
Enter information in the yellow shaded areas.		DE			
1. PROJECT NAME:					
Bethany Beach Training Site Transient Training Officers Quarters					
2. PROJECT NUMBER: (MILCON if applicable)		3. DATE PREPARED:			
100103		1 September 2020			
4. START DATE of PROPOSED ACTION (dd-mmm-yy):		15-Nov-20	Note: This must be a future date		
5. PROGRAMMED FISCAL YEAR: <small>FY21</small>					
6. END DATE (if applicable): <small>FY25</small>					
7. DESCRIPTION AND LOCATION OF THE PROPOSED ACTION:					
a. Location (Include a detailed map, if applicable):					
163 Scannell Blvd, Bethany Beach, DE					
b. Description:					
A standard design Transient Training barracks of permanent construction. The barracks includes the following items that are integral for facility; comprehensive interior design services are requested. This facility will be designed to meet Industry Standards as well as all local, State, and federal building codes.					
8. CHOOSE ONE OF THE FOLLOWING:					
<input type="checkbox"/> An existing environmental assessment* adequately covers the scope of this project. Attach FNSI if EA was completed by another federal agency (non-ARNG).					
EA Date (dd-mmm-yy):		Lead Agency:			
<input type="checkbox"/> An existing environmental impact statement* adequately covers the scope of this project.					
EIS Date (dd-mmm-yy):		Lead Agency:			
<input checked="" type="checkbox"/> After reviewing the screening criteria and completing the ARNG environmental checklist, this project qualifies for a					
Categorical Exclusion Code:		C-1: Construction of an addition to an existing structure or new...			
See 32 CFR 651 App. B					
Categorical Exclusion Code:					
See 32 CFR 651 App. B					
Categorical Exclusion Code:					
See 32 CFR 651 App. B					
<input type="checkbox"/> This project is exempt from NEPA requirements under the provisions of:					
Cite superseding law:					
*Copies of the referenced EA or EIS can be found in the ARNG Environmental Office within each state.					
9. REMARKS:					
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;"> <div style="background-color: yellow; height: 15px; margin-bottom: 5px;"></div> <div style="text-align: center;">Signature of Proponent (Requester)</div> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">Mr. William F. Cost</div> <div style="text-align: center;">Printed Name of Proponent (Requester)</div> <div style="background-color: yellow; height: 15px; margin-top: 10px;"></div> <div style="text-align: center;">Date Signed</div> </td> <td style="width: 50%; text-align: center;"> <div style="background-color: yellow; height: 15px; margin-bottom: 5px;"></div> <div style="text-align: center;">Environmental Program Manager</div> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">Mr. Brian S. Nichols</div> <div style="text-align: center;">Printed Name of Env. Program Manager</div> <div style="background-color: yellow; height: 15px; margin-top: 10px;"></div> <div style="text-align: center;">Date Signed</div> </td> </tr> </table>				<div style="background-color: yellow; height: 15px; margin-bottom: 5px;"></div> <div style="text-align: center;">Signature of Proponent (Requester)</div> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">Mr. William F. Cost</div> <div style="text-align: center;">Printed Name of Proponent (Requester)</div> <div style="background-color: yellow; height: 15px; margin-top: 10px;"></div> <div style="text-align: center;">Date Signed</div>	<div style="background-color: yellow; height: 15px; margin-bottom: 5px;"></div> <div style="text-align: center;">Environmental Program Manager</div> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">Mr. Brian S. Nichols</div> <div style="text-align: center;">Printed Name of Env. Program Manager</div> <div style="background-color: yellow; height: 15px; margin-top: 10px;"></div> <div style="text-align: center;">Date Signed</div>
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Proponent Information:					
10. Proponent: DEARNG FMO					
11. Address: 1 Vavala Way, New Castle, DE 19720-1502					
12. POC: Mr. William F. Cost					
13. Comm. Voice: 302-326-7148					
14. Proponent POC e-mail: william.f.cost.civ@mail.mil					

1. COMPONENT ARNG	FY 2021 GUARD AND RESERVE MILITARY CONSTRUCTION	2. DATE 16 Mar 20			
3. INSTALLATION AND LOCATION BETHANY BEACH, DE		4. AREA CONSTR COST INDEX 1.13			
11. PERSONNEL STRENGTH AS OF: 01 Sep 2019					
	PERMANENT	GUARD/RESERVE			
	TOTAL OFFICER ENLISTED CIVILIAN	TOTAL OFFICER ENLISTED			
AUTHORIZED	8 2 6 0	50 14 36			
ACTUAL	8 1 7 0	50 14 36			
	Percentage: 100%				
12. RESERVE UNIT DATA					
		STRENGTH			
UIC	UNIT DESIGNATION	TPSN	MTOE/TDA	AUTHORIZED	ACTUAL
W8F6AA	(HQ DE ARNG REG TNG)	66751	NGW8F6AA	40	40
W77807	BETHANY BEACH (DET ARNG TRAINING SIT)	56751	NGW778AA	10	10
Totals				50	50
13. MAJOR EQUIPMENT AND AIRCRAFT					
	TYPE	AUTHORIZED	ACTUAL		
	Wheeled Vehicles	2	0		
	Trailers	0	0		
	Tracked Vehicles	0	0		
	Equipment > 30 FT(includes HEMTT PLS Trailers)	0	0		
	Fuel Truck	0	0		
	HET	0	0		
	Totals	2	0		
14. OUTSTANDING POLLUTION AND SAFETY DEFICIENCIES					
		(\$000)			
	Air Pollution	0			
	Water Pollution	0			
	Safety and Occupational Health	0			

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3. INSTALLATION AND LOCATION BETHANY BEACH, DE		4. PROJECT TITLE TRANSIENT TRAINING OFFICERS QUARTERS New Construction		
5. PROGRAM ELEMENT 0505896A	6. CATEGORY CODE 72412	7. PROJECT NUMBER 95855 100103	8. PROJECT COST (\$000) 5,269	
9. COST ESTIMATES				
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
PRIMARY FACILITIES:		-	-	4969
72114 Billeting Facility	SF	11,977	414.90	(4969)
SUPPORTING FACILITIES:		-	-	1258
85215 Flexible Paving	SY	560	199.79	(112)
85220 Sidewalks	SY	200	221.99	(44)
81230 Exterior Security Lighting	LS	-	177.59	(15)
82410 Utilities: Gas	LS	-	66.60	(2)
81242 Utilities: Electric	LS	-	88.80	(9)
84210 Utilities: Water	LS	-	66.60	(7)
83210 Utilities: Waste Water/Sewer	LS	-	66.60	(7)
87110 Stormwater Drainage	LS	-	-	(9)
13260 Information Systems	LS	-	-	(21)
93310 Offset Disposal	LS	-	-	(750)
93310 Disposal	LS	-	-	(125)
93220 Site Improvement	LS	-	-	(149)
14915 Anti-Terrorism/Force Protection	LS	-	-	(8)
TOTAL CONSTRUCTION COST		-	-	6227
Contingencies (5.0%)		-	-	(311)
Supervision, Inspection and Overhead (3.0%)		-	-	(196)
Design - Build (4.0%)		-	-	(262)
Commissioning (0.6%)		-	-	(30)
TOTAL PROJECT COST		-	-	7026
State Share		-	-	(1757)
TOTAL FEDERAL COST		-	-	5269
Equipment Funded Other Appr (Non-Add)				(329)
10. DESCRIPTION OF PROPOSED CONSTRUCTION				
A standard design Transient Training Barracks of permanent construction. The barracks includes the following items that are integral to the facility; Comprehensive interior design services are requested. This facil				

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ity will be designed to meet Industry Standards as well as all local, State, and Federal building codes and as per Public Law 42 U.S. Code 4154. Construction will include all utility services, information systems, fire detection and alarm systems, roads, walks, curbs, gutters, storm drainage, parking areas, and site improvements. Facilities will be designed to a minimum life of 50 years in accordance with DoDs Unified Facilities Code (UFC 1-200-02) including energy efficiencies, building envelope and integrated building systems performance as per ASA(IE&E) Sustainable Design and Development Policy Update 2017. Access for individuals with disabilities will be provided. Antiterrorism measures in accordance with the DoD Minimum Antiterrorism for building standards will be provided. This project will comply with the Army 1 SQFT for 1 SQFT disposal policy through the disposal of 12,336 SQFT.

MISSION: Current A/C TONNAGE: 40

11. REQUIREMENT:	11,977 SF	Adequate:	0 SF	Substandard:	0 SF
	1,113 m2		0 m2		0 m2

1. PROJECT: To construct a 11,977 SQFT Transient Training Officer Barracks that supports a Level 5 Intermediate Training Site requirements for the DEARNG. This facility will be built on State Land. Current Mission.
2. REQUIREMENT: This facility is designed to meet the needs of the 25U school house. Over the past two years ATRRS shows over 80 Soldiers come through the 25U MOS producing school. DEARNG is predicting those numbers to increase as the need for signal Soldiers increases. In order to accomodate the influx of soldiers to be trained the DEARNG needs to build a larger, modern barracks to house 32 individuals at any given time.
3. CURRENT SITUATION: This project is critical to the state of DE due to the current situation of the current billets built in 1942 house our modern Army, which requires electrical and telecom systems that far exceeds the current infrastructures capabilities. Additionally the rooms are deficient in size, offering no space to study, there are not enough latrines, and there is no fire suppression.

These Non-ADA compliant facilities are located on valuable real estate and have been marked for demolition. BBTS needs new billets to maintain their accreditation as an MOS producing school house, and the regional units deserve modern facilities that protect them from fire hazards while they train and serve their nation.

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3. INSTALLATION AND LOCATION BETHANY BEACH, DE

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The State of DE has conducted a preliminary design on this project and is currently at 10 % Design.

The site for this project is in the possession of the state of DE.

Currently, the state of DE has begun the environmental assessment on this project.

There currently is no facility to complete the mission.

The RAC score is High due the probability code of Seldom which results from the old wiring in the facility, and the serverity code of Catastrophic resulting in the loss of life from potential fire hazards.

The existing barracks are not ADA compliant, nor do they have fire suppression systems installed.

Do to the age and type of construction, the modernizing the existing facilities is not a viable option. The return on investment does not support using ORM dollars to try to solve this issue.

Site Code	Site UID	Cat Code	FACNO	ISR-I Year	F Rating	Q Rating	C Rating	Local Name
10A05	7602	72114	00127	2018	F2	Q1	C4	
10A05	7602	72114	00131	2018	F1	Q1	C4	
10A05	7602	72114	00132	2018	F1	Q1	C4	
10A05	7602	72114	00133	2018	F1	Q1	C4	
10A05	7602	72114	00136	2018	F1	Q1	C4	
10A05	7602	72114	00137	2018	F1	Q1	C4	
10A05	7602	72114	00138	2018	F1	Q1	C4	
10A05	7602	72114	00139	2018	F4	Q3	C4	
10A05	7602	72114	00140	2018	F4	Q3	C4	
10A05	7602	72114	00142	2018	F4	Q3	C4	

Not ADA complaint, nor is there fire suppression in these sleeping quarters.

4. IMPACT IF NOT PROVIDED: 1. How does NOT having this project affect Unit Readiness?
If this project is not provided it would have a significant impact on units nation wide by Soldiers not recieving their required initial MOS training in the 25U field.

2. How does NOT having this project affect O & M Cost? O&M cost will continue

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to be high due to the lack of energy efficient windows, and low R-value concrete block walls.

3. How does NOT having this project affect Operational Tempo (OPTEMPO) Costs? OPTEMPO would be directly impacted by forcing away students from across the nation who would otherwise receive the training which is needed to advance their unit's readiness.

4. How does NOT having this project affect Life Safety? Life safety will continue to be an issue with the current billets not providing fire protection to the Soldiers, and the hallways/latrines not being ADA compliant.

5. How does NOT having this project affect Equipment Maintenance? The existing facilities were created in 1939 and renovated in the 1970's the mechanical in long past its life cycle which is requiring extensive maintenance.

6. How does NOT having this project affect Retention? Without this project retention is project to decrease due to the lack of accommodations the modern military is accustomed to having.

7. How does NOT having this project affect Land/ lease (for leases: date of expiration, Cost and current ATFP at lease location)? This issue is no applicable to this project.

8. How does NOT having this project affect Org/ Mov Parking? This project will increase Pov parking, but not Org/Mov Parking.

9. How does NOT having this project affect ATFP? This project will have no impact on ATFP due to this entire post having a controlled perimeter.

10. How does NOT having this project affect Organizational Storage? This project will have no impact on organization storage due to it being utilized as billeting space.

5. ADDITIONAL: Sustainable principles, to include life cycle cost effective practices, will be integrated into the design, development and construction of the project and will follow the guidance detailed in the Army Sustainable Design and Development Policy complying with applicable laws and executive orders.

6. PHYSICAL SECURITY: This project has been coordinated with the installation ph

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ysical security plan, and all physical security measures are included.

7. ANTITERRORISM/FORCE PROTECTION: This project has been coordinated with the installation antiterrorism plan. Risk and threat analyses have been performed in accordance with DA Pam 190-51 and TM 5-853-1, respectively. Protective measures required by regulation and the minimum standards as required by UFC 4-010-01 (Department of Defense Minimum Antiterrorism Standards for Buildings) are needed. These requirements are included in the description of construction and cost estimate.
8. ECONOMIC ANALYSIS: Alternative methods of meeting this requirement have been explored during project development. This project is the only feasible option to meet the requirement.
9. JOINT USE CERTIFICATION: The Deputy Assistant Secretary of the Army (Installations and Housing) certifies that this project has been considered for joint use potential. This facility will be available for use by other components.

Date

Michael R. Berry
Major General
The Adjutant General

AT/FP POC: LTC Garland Pennington/(302) 326-7080

CFMO: Mr. William Cost/(302) 326-7148

12. SUPPLEMENTAL DATA

a. Estimated design data:

(1) Status:

- (a) Date Design Started.....Oct/2018
- (b) Percent Complete as of January 2020.....65%
- (c) Date Design 35% Complete.....Jun/2019
- (d) Date Design Complete.....Oct/2020
- (e) Parametric Cost Estimating Used to Develop Cost.....No
- (f) Type of Design Contract.....Design - Build

(2) Basis:

- (a) Standard or Definitive Design.....No
- (b) Where Design Was Most Recently Used.....N/A

(3) Total Cost (\$000) (c)=(a)+(b) or (d)+(e):.....(\$000)

- (a) Production of Plans and Specifications.....0

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BETHANY BEACH, DE

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12. SUPPLEMENTAL DATA (CONT)

(b) All Other Design Costs.....	<u>212</u>
(c) Total.....	<u>212</u>
(d) Contract.....	<u>212</u>
(e) In-house.....	<u>0</u>
(4) Construction Award.....	<u>Dec/2020</u>
(5) Construction Start.....	<u>Apr/2021</u>
(6) Construction Completion.....	<u>Oct/2022</u>
(7) Estimated Percent Complete as of 01 Jan 2020 [Budget Year].....	<u>0%</u>
(8) Estimated Percent Complete as of 01 Oct 2020 [Program Year]....	<u>0%</u>

Energy and Life Cycle Costs : An energy study and life cycle cost analysis will be documented during the final design.

b. Equipment associated with this project which will be provided from other appropriations:

<u>Equipment Nomenclature</u>	<u>Procuring Appropriation</u>	<u>Fiscal Year Appropriated or Requested</u>	<u>Cost (\$000)</u>
ISC Equipment	OPA	2022	30
ISCE Proponent	OMNG	2022	50
F F & E	OMNG	2022	249
		Total:	<u>329</u>

Point of Contact: CFMO DE, 302-326-7148

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Detailed Requirement Statements

1. GENERAL: This project is programmed to provide the full requirements of scope at 11,977 SQFT.

This project is 100% federally funded, there isn't a 25% state share requirement. However the state is giving \$1,757,000 to the project.

The Training Site supports over 1500 DE Soldiers, and serves as a regional school house. It will satisfy the officer housing needs for a battalion level event.

2. ANALYSIS OF DEFICIENCY: Functionality and Quality ratings for ISR have not been evaluated, because structures of this category do not exist in the Delaware inventory. This makes the C rating (Quantity) C4 for needed but not constructed. The Officers and School house attendees do not have the minimum space required by regulation to live on post, nor do they have study areas or day rooms.

3. ANALYSIS OF CRITERIA AND EXCEPTIONS FOR NEW CONSTRUCTION: The size and capacity is in accordance with NG Pam 415-12, dated 25 January 2015. The workload has been adequately defined. A standard design is being used for this project.

4. STATEMENT OF PROGRAM RELATED EQUIPMENT: OMNG funds have been programmed in FY2021 in the amount of \$47,800 for the acquisition and installation of 25 High back chairs at a unit Cost of \$ 512.00 per chair, 25 beds at a unit cost of \$650 per bed, and 25 desks at a unit cost of \$750.00 per desk.

5. DISPOSITION OF PRESENT ACCOMMODATIONS: This project is in compliance with the Stewart B. McKinney Homeless Assistance Act and does not include the disposal of a building eligible for or on the National Register of Historic Places.

Site Code	FACNO	Cat Code	Title	SF	Disposition	Cost (\$000)
10A05	00128	14186	TT Company HQ	1152	Demo	125
10A05	00129	14183	Training Site HQ	2100	Demo	125
10A05	00139	72114	Enlisted Barracks	2408	Demo	125
10A05	00140	72114	Enlisted Barracks	2408	Demo	125
10A05	00141	73075	Latrine	1650	Demo	125
10A05	00120	73075	Latrine	1540	Demo	125
10A05	TRL25	74087	Rec Park Svc Bldg	1078	Demo	125

6. CONTRIBUTIONS TO READINESS: a. How will readiness be enhanced by construction of this project?
Readiness will be enhanced by providing quality quarters to officers who

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more suitable setting unit officers attending training at this site.

b. How will readiness be impaired by deferring this project to a future program year?
If pushed back regional units will continue to place their Soldiers in substandard living quarters while the officers will be forced to spend government money to live on the economy in this resort town. The Bethany Beach Training Site will suffer from a lack of units willing to participate in the training it has to offer, due to their inadequate billeting.

c. Why does this project contribute more than another project?
This project contribute more, because it will allow larger units to focus on their training instead of the logistical headache which is caused by not having the require billet space.

7. CLEAN AIR ACT: Permits and/or other procedural requirements mandated by state, interstate, and local air pollution control agencies have been compiled for this project. Copies of all federally required permits and/or registration applications and responses have been forwarded to the U.S. Army center for health promotion and preventive medicine, attn: MCHB-TS-EAP, Aberdeen Proving Ground, MD 21010-5422.

8. TELECOMMUNICATIONS: All telecommunications have been planned as per ISCE program/documentation and have been uploaded to Tab F of the DD1391 Processor in PAX.

9. ECONOMIC ANALYSIS: Documentation for an Economic Analysis conducted using ECONPAC software has been uploaded into TAB-D of the DD1390/91 Processor in PAX.

10. ANTITERRORISM/FORCE PROTECTION: a) A risk analysis for this project [has not been conducted / has been conducted on [date] and coordinated with the installation AT/FP plan. Risk and threat analyses have been performed in accordance with DA Pam 190-51 and TM 5-853-1, respectively].
b) A threat analysis for this project [has not been conducted / has been conducted on [date] and coordinated with the installation physical security plan].
c) The building design is to comply with standard design requirements per UFC 4-010-01 for Antiterrorism/Force Protection measures.[All required physical security and antiterrorism/force protection measures are included. / The Risk and Threat Analysis for this base is Confidential and is unavailable].

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<p>d) This project is to be constructed within a [Controlled / Non-Controlled] Perimeter.</p> <p>e) This project [meets / does not meet] conventional standoff as per UFC 4-010-01.</p> <p>f) This project will be [greater than or equal to / less than] three stories of construction.</p> <p>11. TRAFFIC ANALYSIS: Traffic analysis is not applied to this project. This project is programmed to be built on an existing training site and traffice is not projected to change due to its construction.</p> <p>12. SPECIAL PROGRAM REQUIREMENTS: None</p> <p>13. RPMA DISCUSSION None</p>		

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

Functional Space Details - Actual/ English

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
ARNG - Training Center Facilities	0	0	
TC Level: 1 --> I, 2 --> II, 3 --> III, 4 --> IV, 5 --> V	5	5	
Overnight Patient Observation Required:	No	No	
MEDEVAC capability to be located on the training site:	Yes	No	
Aviation Unit Sprt > 30 Day/Yr:	No	No	
Existing Aerial Gunnery Range:	No	No	
Select the Type of buildings to be developed or altered:			
Billeting:	1	1	
No. of Dining Facilities:			
a. 200 Person Dining Facility	1	0	
b. 400 Person Dining Facility	0	0	
c. 800 Person Dining Facility	0	0	
No. of Bde Headquarters TT:	0	0	
No. of Brigade Support Fac:			
a. Heated Storage	0	0	
b. Unheated Storage	0	0	
No. of Bn Headquarters TT:	0	0	
No. of Co Supply/Admin:	3	0	
Training Center Headquarters:	1	0	
Physical Fitness Area:	1	0	
No. of Bn Sup/Rat Breakdown:	0	0	
Cleaning/Maint Bldg:	1	0	
No. of Battalion Maintenance Shelters:	0	0	
Troop Medical Clinic:	0	0	
Physical Exam Center:	1	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
General Instruction Buildings Base:	1	0	
Chapel:	1	0	
ID Processing Facility:	1	0	
Public Works Facility:	1	0	
Police Station:	1	0	
Fire Station:	1	0	
Recycling:	1	0	
Mail Room:	1	0	
TASC:	1	0	
ASP Operations:	1	0	
No. of Full-Time Employees Not on TDA:	12	12	
Military Population Supported by TC	1,500	1,500	
Modeled Billet Spaces	640	0	
E4 and below	337	0	
E5 and E6	185	0	
E7 through E9	52	0	
W01, CW2, O1, O2	32	0	
CW3-CW5, O3-O6	34	0	
Requested Billet Spaces	32	32	
E4 and below	0	0	
E5 and E6	0	0	
E7 through E9	0	0	
W01, CW2, O1, O2	4	4	
CW3-CW5, O3-O6	28	28	
A. Cantonment Facilities	0	0	
1 Billeting Room Type Allocation	698	32	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
a. E4 and below	583	0	
1) Open Bay	580	0	
2) 2 + 2 (Shared Rooms with Latrine)	0	0	
3) 1 + 1 (Shared Rooms with Latrine)	3	0	
b. E5 and E6	2	0	
1) Open Bay	0	0	
2) 2 + 2 (Shared Rooms with Latrine)	0	0	
3) 1 + 1 (Shared Rooms with Latrine)	2	0	
c. E7 through E9	33	0	
1) 2 + 2 (Shared Rooms with Latrine)	0	0	
2) 1 + 1 (Shared Rooms with Latrine)	24	0	
3) Private Room with Private Bath	9	0	
d. WO1, CW2, O1, O2	44	4	
e. CW3-CW5, O3-O6	33	28	
f. General Officers	3	0	
2 Billeting Space	12,512	7,864	
No. of Stories:	2	2	
a. Open Bay	0	0	
b. 2 + 2 (Shared Rooms with Latrine)	0	0	
c. 1 + 1 (Shared Rooms with Latrine)	0	0	
d. Private (Individual Rooms with Private Latrine)	11,840	7,520	X
e. Lounge/Vending	384	200	
f. Laundry	288	144	X
Total Net Billeting Area	12,512	7,864	
Maintenance and Storage (3% of Total Net Area)	376	236	
Mechanical/Electrical Room (5% of Total Net Area)	626	394	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Telecom/IT (1% of Total Net Area)	126	79	
Circulation Allowance (22% or 27% of Total Net Area)	3,683	2,315	
Structural Allowance (10% of Total Net Area)	1,733	1,089	
Total Gross Billeting Area	19,056	11,977	
3a. 200 Person Dining Facilities Count	0	0	
No. of Stories:	0	0	
Net Dining Facility Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Dining Facility Area (One)	0	0	
Gross Dining Facility Area (Total)	0	0	
Adjusted Gross Dining Facility Alteration Area	0	0	
—			
3b. 400 Person Dining Facilities Count	0	0	
No. of Stories:	0	0	
Net Dining Facility Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Dining Facility Area (One)	0	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Gross Dining Facility Area (Total)	0	0	
Adjusted Gross Dining Facility Alteration Area	0	0	
—			
3c. 800 Person Dining Facilities Count	0	0	
No. of Stories:	0	0	
Net Dining Facility Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Dining Facility Area (one)	0	0	
Gross Dining Facility Area (Total)	0	0	
Adjusted Gross Dining Facility Alteration Area	0	0	
—			
4 Bde. Headquarters TT Count	0	0	
No. of Stories:	0	0	
Net Bde HQ Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Bde HQ Area (One)	0	0	
Gross Bde HQ Area (Total)	0	0	
Adjusted Gross Bde HQ Alteration Area	0	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

Authorized Requested Memo

—		
5 Brigade Support Facilities		
5a. Bde Heated Storage Count	0	0
No. of Stories:	0	0
Net Bde Htd Strg Area (One)	0	0
Maintenance and Storage (3% of Total Net Area)	0	0
Mechanical/Electrical Room (5% of Total Net Area)	0	0
Telecom/IT (1% of Net Area)	0	0
Circulation Allowance (15% or 22% of Total Net Area)	0	0
Structural Allowance (10% of Total Net Area)	0	0
Gross Bde Htd Strg Area (One)	0	0
Gross Bde Htd Strg Area (Total)	0	0
Adjusted Gross Bde Sprt Fac Alteration Area	0	0
—		
5b. Bde Unheated Storage Count	0	0
No. of Stories:	0	0
Net Bde Unhtd Strg Area (One)	0	0
Maintenance and Storage (3% of Total Net Area)	0	0
Mechanical/Electrical Room (5% of Total Net Area)	0	0
Telecom/IT (1% of Net Area)	0	0
Circulation Allowance (15% or 22% of Total Net Area)	0	0
Structural Allowance (10% of Total Net Area)	0	0
Gross Bde Unhtd Strg Area (One)	0	0
Gross Bde Unhtd Strg Area (Total)	0	0
Adjusted Gross Bde Sprt Fac Alteration Area	0	0

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Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
6 Bn Headquarters TT Count	0	0	
No. of Stories:	0	0	
Net Bn HQ Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Bn HQ Area (One)	0	0	
Gross Bn HQ Area (Total)	0	0	
Adjusted Gross Bn HQ Alteration Area	0	0	
—			
7 Co. Supply/Admin Count	0	0	
No. of Stories:	0	0	
Net Co. Supply/Admin Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Co. Supply/Admin Area (One)	0	0	
Gross Co. Supply/Admin Area (Total)	0	0	
Adjusted Gross Co. Supply/Admin Alteration Area	0	0	
—			
8 Physical Fitness Facility	0	0	
No. of Stories:	0	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Total Net Physical Fitness Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross Physical Fitness Area	0	0	
Adjusted Gross Physical Fitness Area	0	0	
—			
9 Bn Sup/Rat Breakdown Count	0	0	
No. of Stories:	0	0	
Net Bn Sup/Rat Brkdwn Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Bn Sup/Rat Brkdwn Area (One)	0	0	
Gross Bn Sup/Rat Brkdwn Area (Total)	0	0	
Adjusted Gross Bn Sup/Rat Brkdwn Alteration Area	0	0	
—			
10 Cleaning/Maint Bldg	0	0	
No. of Stories:	0	0	
Total Net Cleaning/Maint Bldg Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross Net Cleaning/Maint Bldg Area	0	0	
Adjusted Gross Net CIng/Mnt Bldg Alteration Area	0	0	
—			
11 Battalion Maint Shelter Count	0	0	
No. of Stories:	0	0	
Net Bn Mnt Shltr Area (One)	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Gross Bn Mnt Shltr Area Area (One)	0	0	
Gross Bn Mnt Shltr Area Area (Total)	0	0	
Adjusted Gross Bn Mnt Shltr Area Alteration Area	0	0	
—			
12 Training Device/Simulation Center Area	0	0	
No. of Stories:	0	0	
Total Net Trng Device/Sim Cntr Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	

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171T: ARNG - Training Center Facilities

Authorized Requested Memo

Total Gross Trng Device/Sim Cntr Area	0	0	
Adjusted Gross Trng Device/Sim Cntr Alteration Area	0	0	
—			
13 Distance Learning Center Area	0	0	
No. of Stories:	0	0	
Total Net Dstnc Lrng Cntr Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross Dstnc Lrng Cntr Area	0	0	
Adjusted Gross Dstnc Lrng Cntr Alteration Area	0	0	
—			
14 General Instruction Buildings Base	0	0	
No. of Stories:	0	0	
Total Net Gnrl Instrctn Bldg Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross Gnrl Instrctn Bldg Area	0	0	
Adjusted Gross Gnrl Instrctn Bldg Alteration Area	0	0	
—			
15 Mail Room	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
No. of Stories:	0	0	
Total Net Mail Room Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross Mail Room Area	0	0	
Adjusted Gross Mail Room Alteration Area	0	0	
—			
16 Training Aids Support Center (TASC)	0	0	
No. of Stories:	0	0	
Total Net Trng Aids Sprt Cntr Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross Trng Aids Sprt Cntr Area	0	0	
Adjusted Gross Trng Aids Sprt CntrAlteration Area	0	0	
—			
17 Ammunition Supply Point (ASP) Operations	0	0	
No. of Stories:	0	0	
a. ASP Storage Facility	0	0	
b. ASP Administrative Offices	0	0	
c. Surveillance/Operation Building	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
d. Residue Building	0	0	
Total Net ASP Area	0	0	
Maintenance and Storage (3% of Total Net Area)	0	0	
Mechanical/Electrical Room (5% of Total Net Area)	0	0	
Telecom/IT (1% of Net Area)	0	0	
Circulation Allowance (15% or 22% of Total Net Area)	0	0	
Structural Allowance (10% of Total Net Area)	0	0	
Total Gross ASP Area	0	0	
Adjusted Gross ASP Alteration Area	0	0	
—			
B. Medical Clinic	0	0	
No. of Provider Teams:	0	0	
No. of Provider Teams > 6 Providers:	0	0	
No. of Nurses:	0	0	
No. of Administrative Positions:	0	0	
No. of Injection Stations:	0	0	
No. of Primary Care Clinics:	0	0	
No. of Immunization Rooms:	0	0	
No. of Stories:	0	0	
1 Clinic Entrance	0	0	
2 Entrance Lobby	0	0	
3 Public Toilet	0	0	
4 Information Desk	0	0	
5 Radiology	0	0	
6 Clinic Pharmacy	0	0	
7 Advice Nurse Area	0	0	

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171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
8 Appointment Clerk	0	0	
9 Central Waiting	0	0	
10 Reception Control	0	0	
11 Screening, Weights, & Measures	0	0	
12 Provider Exam Rooms	0	0	
13 Isolation Exam	0	0	
14 Dedicated isolation toilet	0	0	
15 Patient Toilets	0	0	
16 Administrators Office	0	0	
17 Providers Office	0	0	
18 Nurse Manager	0	0	
19 Nurses Workroom	0	0	
20 NCOIC/LCPO/LPO Office	0	0	
21 Clean Utility Room	0	0	
22 Soiled Utility Room	0	0	
23 Scope Wash Room	0	0	
24 Equipment Storage	0	0	
25 Team Conference Room	0	0	
26 Litter/wheelchair storage	0	0	
27 Staff Lounge	0	0	
28 Staff Lockers	0	0	
29 Staff Toilets	0	0	
30 Janitorial Closet	0	0	
31 Treatment Room - GP	0	0	
32 Holding Room	0	0	
33 Treatment Room (2 Station)	0	0	

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171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
34 Immunization Waiting Area	0	0	
35 Immunization Room	0	0	
36 Immunization Holding area	0	0	
37 Orthopedic Appliance Mod, Prep & Cast Room	0	0	
38 Laboratory (Mini Lab)	0	0	
39 Physical Exam Wing	0	0	
No of Exams Per Year:	0	0	
Support Flight Physical Exams:	No	No	
a. Reception, Waiting and Form Writing	0	0	
b. Doctors Office	0	0	
c. Exam Room	0	0	
d. History Station	0	0	
e. Height and Weight Station	0	0	
f. Blood Pressure and Pulse Station	0	0	
g. Electronic Consult System (ECS) and Tonometry	0	0	
h. Lab	0	0	
i. Blood Specimen Collection	0	0	
j. Specimen Toilet	0	0	
k. Vision Test	0	0	
l. Hearing Test	0	0	
m. Dental Check (100 sf ea).	0	0	
n. Interfunctional Circulation	0	0	
Total Medical Clinic Facility Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	

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171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total Medical Clinic Facility Gross Area	0	0	
C. Chapel	0	0	
No. of Seats:	160	0	
No. of Stories:	0	0	
1 Chapel	0	0	
2 Altar	0	0	
3 Storage	0	0	
4 Chancel	0	0	
5 Chaplains Office	0	0	
6 Chaplain Assistant and Waiting	0	0	
7 NCOIC	0	0	
8 Chaplain Trainee	0	0	
9 Counseling Room	0	0	
10 Rest Rooms	0	0	
Total Chapel Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total Chapel Facility Gross Area	0	0	
D. Training Center Headquarters	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
	Yes	No	
Detached Unit Unheated Storage:			
No. of Controlled Waste Barrels:	45	0	
No. of Stories:	0	0	
1 Multi-functional Training Area	0	0	
2 Library/Classroom	0	0	
3 learning Center	0	0	
4 Training Aid Storage	0	0	
5 Kitchen	0	0	
6 Break Room	0	0	
7 Vending Area	0	0	
8 Toilets/showers	0	0	
a. Toilets	0	0	
b. Showers	0	0	
9 Flammable Materials Storage	0	0	
10 Family Readiness Office	0	0	
11 Recruiting/Retention Office	0	0	
12 Audio/Visual Storage	0	0	
13 Table/Chair storage	0	0	
14 Administrative Office Space	0	0	
15 Special Administrative Allowances	0	0	
16 Unit Storage	0	0	
a. Heated Storage Space	0	0	
b. Unheated Storage Space	0	0	
17 Locker room Space	0	0	
18 Controlled Waste Handling Facility	0	0	
19. Other special Facilities	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
a. _	0	0	
b. _	0	0	
c. _	0	0	
d. _	0	0	
e. _	0	0	
Total Training Center HQ Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total Training Center HQ Gross Area	0	0	
Detached Unheated Unit Storage	0	0	
Circulation Allowance (15% of Net)	0	0	
Structural Allowance (10% of Net Space)	0	0	
Gross Unheated Unit Storage	0	0	
-			
E. ID Processing Facility	0	0	
No. of Employees:	2	0	
No. of Workstations:	2	0	
No. of Stories:	0	0	
1 Work Station Allowance	0	0	
2 File Storage	0	0	
3 Personnel Holding Space/Photo Processing	0	0	
4 User Specific Display Area	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
5 Waiting Room/Reception Area	0	0	
6 Break Room/Area	0	0	
7 Toilet and Shower	0	0	
8 Locker Room	0	0	
Total ID Processing Facility Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total ID Processing Facility Gross Area	0	0	
F. Public Works Facility	0	0	
No. of Employees:	0	0	
No. of Draftsmen:	0	0	
No. of Draftsmen Tables:	0	0	
GIS Operator Count	0	0	
No. of Stories:	0	0	
1 Administration	0	0	
a. Conference/Classroom	0	0	
b. Record/Archive Storage	0	0	
c. Drafting Office	0	0	
d. Drafting Table	0	0	
e. Geographic Information Systems (GIS) Operator	0	0	
f. Learning/Library Center	0	0	
g. Drafting Supply Storage Area	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
h. Surveying Equipment Storage Area	0	0	
i. Break Room/Area	0	0	
j. Toilet and shower	0	0	
k. Locker Room	0	0	
2 Facilities Maintenance Section	0	0	
a. Carpenters Shop	0	0	
b. Electrical Shop	0	0	
c. Plumbing Shop	0	0	
d. Machine Shop	0	0	
e. HVAC Shop	0	0	
f. Glass Repair Shop	0	0	
g. Locksmith Shop	0	0	
h. Sign Shop	0	0	
i. Paint Shop w/Heated Storage	0	0	
j. Telecom Shop	0	0	
k. Tool Room	0	0	
l. Tool Issue Office	0	0	
m. Supply Warehouse	0	0	
n. Supply Yard	0	0	
3 Roads and Grounds Shop	0	0	
a. Grounds Maintenance Shop	0	0	
b. Operator Repair Workbay (32x64)	0	0	
c. Tool Room	0	0	
d. Welding Shop	0	0	
e. Ground Maintenance Equipment Storage	0	0	
f. Equipment Storage Compound	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Total Public Works Facility Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total Public Works Facility Gross Area	0	0	
G. Police Station	0	0	
No. of Employees	0	0	
No. of Dispatchers	0	0	
No. of Holding Cells	0	0	
No. of Stories:	0	0	
1 Holding Cells	0	0	
2 Arms Vault	0	0	
3 Dispatch Office	0	0	
4 Evidence Room	0	0	
5 Training Aid Storage	0	0	
6 Break Room/Area	0	0	
7 Toilet and Shower	0	0	
8 Locker Room	0	0	
Total Police Station Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
Structural Allowance (10% of Net Area)	0	0	
Total Police Station Gross Area	0	0	
H. Fire Station	0	0	
No. of Employees:	0	0	
No. of Stories:	0	0	
1 Administrative Training Area	0	0	
2 Apparatus/Equipment Area	0	0	
3 Billeting	0	0	
4 Latrines/Shower/Locker Rooms/Laundry/etc.	0	0	
Total Fire Station Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total Fire Station Gross Area	0	0	
I. Recycling Center	0	0	
No. of Employees:	0	0	
No. of Bailers:	0	0	
No. of Glass Colors:	0	0	
No. of Transfer Point Containers:	0	0	
No. of Scrap Metal Containers:	0	0	
No. of Stories:	0	0	
1 Office/Admin Space	0	0	

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Date: Apr 1, 2020

171T: ARNG - Training Center Facilities

	Authorized	Requested	Memo
2 Break Area	0	0	
3 Latrines/Shower	0	0	
4 Horizontal Bailer Area	0	0	
5 Paper Shredding Area	0	0	
6 Brass Deformer/Shredding Area	0	0	
7 Conveyor Area	0	0	
8 Glass Processing Area	0	0	
9 Storage Area	0	0	
10 Receiving Area	0	0	
11 Sorting Area	0	0	
12 Shipping Area	0	0	
13 Intra-functional	0	0	
14 Battery Charging Area	0	0	
15 Trash Transfer Point	0	0	
16 Scrap Metal Storage Area	0	0	
17 Pallet Processing Area	0	0	
18 Truck Scales Area	0	0	
Total Recycling Center Net Area	0	0	
Facility Maintenance and Storage (3% of Net Area)	0	0	
Mechanical/Electrical Room (5% of Net Area)	0	0	
Telecom/Info Tech (1% of Net Area)	0	0	
Circulation Allowance (15% - 22% of Net Area)	0	0	
Structural Allowance (10% of Net Area)	0	0	
Total Recycling Center Gross Area	0	0	
Total Training Facility Gross Area	19,056	11,977	

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Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

ARNG - Common Supporting Items

	Authorized	Requested	Existing	Memo
ARNG - Common Supporting Items				
Unheated Vehicle Strg Shed Needed:	Yes	No	0	
Wash Platform Required:	No	No	0	
Loading Ramp Required:	No	No	0	
MCOFT Type Simulator Required:	No	No	0	
ASP Mission:	No	No	0	
Rigid Paving for Access Road:	No	No	0	
Access Road Length (LF)	0	0	0	
No. of Controlled Waste Access Facilities:	0	0	0	
No. of Vehicles for Largest Habitual Unit Customer:	0	0	0	
No. of Fuel Trucks/Trlr to be Parked with Fuel:	0	0	0	
No. of Trucks Simultaneously at Loading Dock:	0	0	0	
No. of Turning Pads:	0	0	0	
No. of Refuse Collection/Dumpster Sites:	0	0	0	
No. of GSE Facility Entries:	0	0	0	
No. of Other Access Apron Service Sites:	0	0	0	
No. of Generator Pads	1	0	0	
Fuel Storage and Dispensing Systems (EA)				
A. Total Vehicles Requiring Support	0	0	0	
1. Vehicles Requiring MOGAS (EA)	0	0	0	
2. Vehicles Requiring Diesel Fuel (EA)	0	0	0	
3. Vehicles Requiring AVGAS (EA)	0	0	0	
4. Vehicles Requiring Other Fuel (EA)	0	0	0	
B. Organizational Vehicle Parking				
1. Training Center Parking Areas	0	0	0	
a. Division Headquarters (SY)	0	0	0	

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Date: Apr 1, 2020

ARNG - Common Supporting Items

	Authorized	Requested	Existing	Memo
b. Brigade Headquarters (SY)	0	0	0	
c. Battalion Headquarters (SY)	0	0	0	
d. Battalion Supply/Ration Breakdown (SY)	0	0	0	
e. Company Supply and Administration (SY)	0	0	0	
f. Dining Facilities	0	0	0	
1) 200 Person (SY)	0	0	0	
2) 400 Person (SY)	0	0	0	
3) 800 Person (SY)	0	0	0	
g. Troop Medical Clinic (SY)	0	0	0	
h. Physical Fitness Area (SY)	0	0	0	
i. Motor Pool (SY)	0	0	0	
j. Div/Bde Support Heated Storage Facility (SY)	0	0	0	
2. Other Functional Activities				
a. Authorized based on Vehicle Inventory	0	0	0	
1) Wheeled vhcl and trlr/towed equip (SY)	0	0	0	
2) Tracked/engr vehicle, and equip > 30 (SY)	0	0	0	
3) Fuel Truck (SY)	0	0	0	
4) HET vehicle (SY)	0	0	0	
3. Unheated Enclosed Vehicle Storage Shed (SF)	0	0	0	
4. Total Exterior Organizational Vehicle Parking (SY)	0	0	0	
C. Loading Docks				
1. ASP Covered Loading Dock (LS)	No	No	0	
D. Wash Platform (EA)	0	0	0	
E. Military Vehicle Loading Ramp (EA)	0	0	0	
F. Rigid Pavement Other Than Parking (SY)	150	0	0	
1. Structures and Pads Supporting Operations (SY)	150	0	0	

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Date: Apr 1, 2020

ARNG - Common Supporting Items

	Authorized	Requested	Existing	Memo
a. Fuel Truck Containment Area (SY)	0	0	0	
b. Military Vehicle Loading Ramp Sprt (SY)	0	0	0	
c. Turn Pads (SY)	0	0	0	
d. Training Center Fire Station Helipad (SY)	0	0	0	
e. Parking Pad for MCOFT Type Simulators (SY)	0	0	0	
f. ASP Vehicle Marshalling/Inspection Area (SY)	0	0	0	
g. Generator Pad with Electrical Hookup (SY)	150	0	0	
2. Service and Access Aprons (SY)	0	0	0	
a. Military Vehicle Loading Ramp (SY)	0	0	0	
b. Wash Platform Pad (SY)	0	0	0	
c. Wash Platform Access (SY)	0	0	0	
d. Refuse Collection/Dumpster Pad (SY)	0	0	0	
e. Controlled Waste Handling (SY)	0	0	0	
f. Fuel Pump Island (SY)	0	0	0	
g. Fuel Pump Access (SY)	0	0	0	
h. Loading Dock Access (SY)	0	0	0	
i. Other Service Area (SY)	0	0	0	
j. Vehicle Storage Shed Apron (SY)	0	0	0	
3. Special Aviation Paving Requirements (SY)	0	0	0	
a. Aviation Facilities for Training Centers	0	0	0	
No. of Refueling vehicles:	0	0	0	
No. of Aerial Gunnery Ranges:	0	0	0	
1) Helipad	0	0	0	
2) Aircraft Maintenance Area	0	0	0	
3) Aircraft Maintenance Area Access Pad	0	0	0	
4) Aircraft Tie-down Pads	0	0	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

ARNG - Common Supporting Items

	Authorized	Requested	Existing	Memo
5) Aerial Gunnery Range	0	0	0	
a) Firing Harmonization Points	0	0	0	
b) Rearming/Refueling Points	0	0	0	
4. Access Road and Entrance Throat (SY)	0	0	0	
G. Flexible Pavement (SY)	6,820	560	0	
1. Privately owned vehicle (POV) parking (SY)	840	140	0	
2. Visitor/Customer Parking (SY)	0	0	0	
3. Access Road and Entrance Throat (SY)	5,000	0	0	
4. Parking for Training Center Functions	980	420	0	
a. Cantonment Area POV (SY)	980	420	0	
b. Police Station	0	0	0	
No of Organizational Vehicles:	0	0	0	
1) POV (SY)	0	0	0	
2) Organizational (SY)	0	0	0	
3) Visitor (SY)	0	0	0	
c. Fire Station	0	0	0	
No. of Vehicles <= 30 ft Long:	0	0	0	
No. of Vehicles > 30 ft Long:	0	0	0	
1) POV (SY)	0	0	0	
2) Organizational (SY)	0	0	0	
H. Sidewalks (SY)	200	200	0	
I. TC Cantonment Road Sidewalks (SY)	0	0	0	
J. Curbs (LF)	284	0	0	
K. Security Fencing (LF)	256	0	0	
L. Flagpole(s) (EA)	2	0	0	
M. Exterior Fire Protection (LS)	No	No	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

ARNG - Common Supporting Items

	Authorized	Requested	Existing	Memo
N. Detached Facilities Sign/Static Display (EA)	0	0	0	
O. Outside Security Lighting (LS)	Yes	Yes	0	
P. Utilities (LS)				
1. Gas (LS)	No	No	0	
2. Electric (LS)	Yes	Yes	0	
3. Chilled/Heated Water Dist System (LS)	No	No	0	
4. Water (LS)	Yes	Yes	0	
5. Waste Water/Sewer (LS)	Yes	Yes	0	
Q. Storm Water Drainage (LS)	Yes	Yes	0	
R. Range Support Facility Items				
1. Fencing (LF)	0	0	0	
2. Walks (SY)	0	0	0	
3. Range Flag/Safety Barriers (LS)	No	No	0	
4. Range Sign (LS)	No	No	0	
5. Range Utilities (LS)	No	No	0	
6. Range Communication (LS)	No	No	0	
7. Bivouac Area (AC)	0	0	0	
8. Unit Staging Area (SY)	0	0	0	
S. Training Center Roads				
1. Road Lengths for:				
Cantonment Area (Flexible Pavement) (LF):	0	0	0	
Tank Trails (Stabilized Hardstand)	0	0	0	
Main (LF)	0	0	0	
Secondary (LF)	0	0	0	
Training Area (Improved Gravel)	0	0	0	
Tracked Vehicle (LF)	0	0	0	

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

ARNG - Common Supporting Items

	Authorized	Requested	Existing	Memo
Non-Tracked Vehicle (LF):	0	0	0	
Other Roads (Flexible Pavement) (LF):	0	0	0	
2. Road Surface Area	0	0	0	
a. Flexible Pavement (SY)	0	0	0	
b. Stabilized Hardstand (SY)	0	0	0	
c. Improved Gravel (SY)	0	0	0	
T. Installed Equipment (EA)	0	0	0	
1. Land Mobile Radio System Tower	0	0	0	
2. Access Control Facilities	0	0	0	
3. Refuse Collection Facilities	0	0	0	
4. Other Installed Equipment (LS)	0	0	0	
a.	No	No	0	
b.	No	No	0	
c.	No	No	0	
d.	No	No	0	
e.	No	No	0	
U. Fuel Storage and Dispensing Systems (EA)	0	0	0	
1. 3000 Gallons	0	0	0	
2. 5000 Gallons	0	0	0	
3. 7000 Gallons	0	0	0	
4. 10000 Gallons	0	0	0	
5. 20000 Gallons	0	0	0	
V. AC Tonnage (Total)	40	0	0	
1. AC Tonnage (Training Center)	40	0	X	0

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

INFO: ARNG - Information Systems Worksheet

Authorized Requested Memo

I ISCE Inputs:

A. Square Footage Tab	11,977	11,977
1 Admin	0	0
2 Intermediate	0	0
3 Barracks	7,520	7,520
4 Warehouse/Storage	0	0
5 Clinic/Medical	0	0
6 Class Rooms	0	0
7 Others	4,457	4,457
B. New Services Tab		
1 Single Line Phone	47	47
2 ISDN Sets	47	47
3 Multi-Line Phones	5	5
4 Weatherproof Phones	1	1
5 Explosive Environment Phones	0	0
6 LAN Ports	47	47
7 Wall/Payphone Outlet w/telephone set (additional)	0	0
8 Fiber Optic Outlets (2RJ-45 wDual SC)	0	0
9 SIPRNET	0	0
10 TV Outlets -- All Services	1	1
C. Cabling, Switching, and Building Tab		
1 No. Persons to Use Facility Initially	50	50
2 No. Ducts into Bldg: 2, 4, 6, 9, 12-way	2	2
3 Maximum Occupant Capacity	99	99
4 Proposed Bldg Entry Duct/Sys Lngth - Underground	0	0
5 Type of Building	3	3

Project Number : 100103

Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction

Date: Apr 1, 2020

INFO: ARNG - Information Systems Worksheet

Authorized Requested Memo

II ISCE Results:

A. Construction Primary Funded (\$000)	61	61	
B. Construction Support Funded (\$000)	21	21	
C. ISC Equipment (OPA \$000)	30	30	X
D. ISCE Proponent (OMNG \$000)	50	50	

Project Number : 100103
Project Title : TRANSIENT TRAINING OFFICERS QUARTERS New Construction
Site Code : 10A05

Project Validation

The Reserve manpower potential to meet and maintain authorized strengths of all Reserve units in the area in which this facility is to be located has been reviewed in accordance with DOD Directive 1225.7. It has been determined, in coordination with all other Services having Reserve units in the area, that the number of units of the Reserve components of the Armed Forces presently located in the area and those which have been allocated to the area for future activation, is not and will not be larger than the number that reasonably can be expected to be maintained at authorized strength.

The proposed project is in compliance with the following acts, executive orders, laws, and rules:

NATIONAL ENVIRONMENTAL POLICY ACT: Project has been analyzed for potential environmental impact in accordance with Environmental Analysis of Army Actions (32 CFR Part 651).

SUSTAINABILITY: The design and execution of this project, where appropriate, will comply with Executive Orders (EOs) 13423 and 13514 with respect to reduction/elimination of hazardous materials and incorporation of sustainability and green building principles.

COASTAL ZONE PLAN: In accordance with the provisions of Section 102(2)(c) of the National Environmental Policy Act of 1969, the project has been reviewed, and it is determined to be in compliance with the States Coastal Zone Plan.

ENDANGERED SPECIES ACT: Project must include a review of threatened and endangered species in accordance with Section 7 of the Endangered Species Act (ESA), 50 CFR 402.

FALLOUT PROTECTION: In accordance with Section 601 of Public Law 89-568, as amended, the design of this project has been prepared to maximize fallout protection. Fallout shelters have been excluded from any structure only for the following reason: (1) Adequate protection areas are available to fulfill a stations requirements.

FLOOD HAZARD: Project has been evaluated for flood hazards in compliance with Executive Order 11988, and the facility is not sited in an area known to be subjected to flooding.

DESIGN ACCESSIBILITY FOR PHYSICALLY HANDICAPPED PERSONNEL: In accordance with 42 U.S. Code 4154, provisions for the physically handicapped personnel will be provided for, where appropriate, in the design of the facility.

VENDING FACILITIES FOR THE BLIND: Project has been evaluated for the provision of vending facilities to be operated by blind persons in compliance with DHEW Rule, 45 CFR-1369, and the State Licensing Board has not sanctioned operation of a blind vending concession at the proposed location.

NATIONAL HISTORIC PRESERVATION ACT OF 1966: This action has the potential to cause adverse effects to historic properties and tribal resources. The State ARNG will consult with the State Historic Preservation Officer (SHPO) and North American Tribes under NHPA prior to project initiation to determine the presence/absence of historic properties that might be adversely affected.

ENVIRONMENTAL CONDITION OF PROPERTY (ECOP): ECOP analysis is required for this project per the requirements of AR 200-1 (Chapter 15-6) and applicable ASTM standards.

AT/FP POC: LTC Garland Pennington
AT/FP Phone: 302-326-7080-null

Michael R. Berry
Major General
The Adjutant General
Date: _____



STATE OF DELAWARE
**DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL**

DIVISION OF CLIMATE, COASTAL & ENERGY
STATE STREET COMMONS
100 W. WATER STREET, SUITE 7B
DOVER, DELAWARE 19904

PHONE
(302) 739-9283

DELAWARE COASTAL
MANAGEMENT PROGRAM

June 11, 2020

Emily Whiting
Delaware Army National Guard
1197 River Road
New Castle, DE 19720

**RE: Delaware Coastal Management Program — Federal Consistency Determination for
DEARNG Bethany Beach Barracks Construction (FC 2020.0053)**

Dear Ms. Whiting,

The Delaware Coastal Management Program (DCMP) of the Delaware Department of Natural Resources and Environment Control (DNREC) has completed its review of the above referenced project. This letter is in response to the federal consistency determination dated and received by this office on April 22, 2020, submitted by you on behalf of the Delaware Army National Guard (DEARNG).

PROPOSED ACTION

The DEARNG proposes construction of a 13,240 square foot housing barracks with an overall height of approximately 30 feet and a 6,500 square foot footprint within the 100-year floodplain of Salt Pond and the Atlantic Ocean at the Bethany Beach Training Site (BBTS) located at 163 Scannell Blvd., Bethany Beach, Sussex County, DE. The barracks will be built on a turfed area in the footprint of Building 120, a demolished latrine. DEARNG will comply with air quality management requirements as they relate to particulate matter from construction and materials handling.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities located inside or outside of Delaware's federally approved coastal management area that can have reasonably foreseeable effects on coastal uses must be implemented in a manner consistent with the enforceable policies of the DCMP including: coastal waters management, flood hazard areas management, historic and cultural areas management, living resources, air quality management, and waste disposal management

FEDERAL CONSISTENCY ANALYSIS

The Delaware Coastal Zone Management (CZM) Program consists of a network of programs administered by several agencies. The DNREC DCMP coordinates the review of consistency determinations with agencies administering the enforceable and advisory policies of the program. The following agencies participated in this review:

DNREC, Division of Water, Surface Water Discharges Section
DNREC, Division of Fish and Wildlife
DNREC, Division of Air Quality

According to the information submitted, the proposed action is consistent with the enforceable policies of the Delaware CZM Program. The Delaware CZM Program has no objections with the determination.

PUBLIC PARTICIPATION

In accordance with 15 CFR §930.42, the public was invited to participate in the review of the DEARNG Bethany Beach Barracks Construction. Public notice of this proposed action was published in the Delaware State News, The News Journal, and DNREC public notices list service on May 10, 2020. The public was given 20 days to comment on this notice. No public comments were received in response to this notice.

CONCURRENCE

Based on its review and pursuant to National Oceanic and Atmospheric Administration regulations (15 CFR 930), the DCMP concurs that the project as proposed is consistent to the maximum extent practicable with the Delaware CZM Program.

Thank you for the opportunity to review and respond to your federal consistency determination review request. If you have any questions, please contact me or Kristi Lieske of my staff at (302) 739-9283.

Sincerely,



Kimberly B. Cole, Administrator
Delaware Coastal Management Program



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
INSTALLATIONS, ENERGY AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON, DC 20310-0110

SEP 16 2020

SAIE-IHP

MEMORANDUM FOR Director, Army National Guard (ATTN: ARNG-IEZ), 111 South George Mason Drive, Arlington, VA 22204-1373

SUBJECT: Approval of Finding of No Practicable Alternative (FONPA) for construction of Project Number 100103 BBTS Barracks at Bethany Beach Training Site, DE

1. Reference: National Guard Bureau (ARNG-IES-E) Memo dated 13 August 2020, SUBJECT: Request For Authority Under Executive Order 11988 to execute Military Construction Within Known Flood Plain-ACTION MEMORANDUM.
2. As requested in above reference, FONPA for the construction of Barracks, Project Number 100103 at Bethany Beach Training Site, DE is approved.
3. The point of contact for this action is Mr. Jae J. Kim in DASA IH&P at 703-693-9919 or jae.j.kim2.civ@mail.mil.

A handwritten signature in black ink, appearing to read "Paul D. Cramer", is positioned above the typed name.

PAUL D. CRAMER
Deputy Assistant Secretary of the Army
(Installations, Housing, and Partnerships)

September 23, 2020

Amy E. McDowell, Environmental Protection Specialist
Delaware Army National Guard
1197 River Road
New Castle, DE 19720

**Subject: Proposed Barracks Building located at the Bethany Beach Training Site,
Bethany Beach, Sussex County
SHPO ER# 2020.07.08.02**

Dear Ms. McDowell:

Thank you for your letter and information, received in this office July 8, 2020, regarding a proposed project located at the Bethany Beach Training Site (BBTS) in Bethany Beach, Delaware. The Delaware Army National Guard (DEARNG) proposes to construct a two-story barracks building located at the BBTS. This project is required in support of the DEARNG mission and the Regional Training Institute.

According to the materials submitted, and as noted within the initiation letter, DEARNG has determined that the BBTS is a historical district and the addition of the proposed two-story barracks building shall impact the view shed of the surrounding community. The Delaware State Historic Preservation Office (DESHPO) requested additional information required to complete the review process.

The additionally requested materials were received on September 22, 2020 and included 3-D computer-aided elevation drawings (sims) of the proposed new construction. These drawings reveal the proposed new construction to be sensitive and complimentary to the architectural design and feeling of the existing military landscape.

A review of this site in conjunction with all the submitted materials has determined that this undertaking will have **No Adverse Effect** on any onsite and/or abutting historic properties in the area. If you require further information or have any questions, please contact me at 302-736-7433 or at kara.briggs@delaware.gov.

Sincerely,



Kara A. Briggs
Architectural Historian

c: Gwen Davis, Deputy SHPO



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127

<http://www.fws.gov/chesapeakebay/>
<http://www.fws.gov/chesapeakebay/endsppweb/ProjectReview/Index.html>

In Reply Refer To:

September 23, 2020

Consultation Code: 05E2CB00-2020-SLI-1872

Event Code: 05E2CB00-2020-E-05179

Project Name: BBTS Transient Training Officers Barracks

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
 - USFWS National Wildlife Refuges and Fish Hatcheries
 - Wetlands
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office

177 Admiral Cochrane Drive

Annapolis, MD 21401-7307

(410) 573-4599

Project Summary

Consultation Code: 05E2CB00-2020-SLI-1872

Event Code: 05E2CB00-2020-E-05179

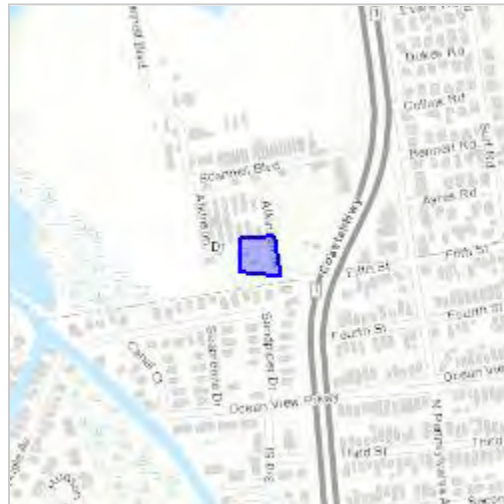
Project Name: BBTS Transient Training Officers Barracks

Project Type: ** OTHER **

Project Description: Barracks will be built to support the RTI.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/38.54547190687305N75.06102938737683W>



Counties: Sussex, DE

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

C. DIVISION 01

GENERAL REQUIREMENTS



TETRA TECH

SECTION 01 03 00.00 48

DESIGN SUBMISSION REQUIREMENTS AFTER AWARD

1.1 INTRODUCTION

This section contains information needed after the successful Offeror has been selected. The information contained in this section applies to the design required for the River Road Training Site, Combined Support Maintenance Shop (CSMS) project located at 1197 River Road, New Castle, DE.

DESIGNERS OF RECORD

1.2.1 The Design/Build Contractor shall identify, for Government Acceptance, the Designer of Record for each area of work. One Designer of Record may be responsible for no more than two disciplines. All Designers of Record shall be registered Professional Engineers or Architects in the State of Delaware.

1.2.2 In addition to these requirements, the design firm shall have a Design Project Manager (PM), see Section 01 45 04.00 for Design PM qualifications.

1.2.3 Provide the services of a Registered Communications Distribution Designer (RCDD) to design the telecommunications system.

1.2.4 Fire protection system Designer of Record is required to be a Registered Fire Protection Engineer. Designer of Record shall perform preliminary calculations and provide the requirements for the fire protection system on the contract drawings/specifications. The fire protection system shop drawings and hydraulic calculations shall be done by a NICET Level III or IV certified fire protection specialist or a Registered Fire Protection Engineer. Sufficient hydraulic calculation sets which will fully define the entire system sizing shall be provided.

1.2.5 The D/B Contractor is required to have a LEED Accredited Professional (LEED AP BD+C) for both design and construction involved with the project and responsible for ensuring correct interpretation of LEED credit requirements, tracking overall LEED accomplishments, providing documentation, and monitoring construction aspects of each LEED credit.

1.2.6 The Designers of Record shall stamp, sign, and date each design drawing under their responsible discipline for Certified Final design documentation stage. Designers of Record shall be a Prime Contractor employee, be contracted directly by the Prime Contractor, or be an employee of a design firm that is contracted directly by the Prime Contractor. The Designer of Record shall not be an owner, employee, agent, or consultant of a construction sub-contractor hired for this project.

1.2.7 Designers of Record are required to make critical site visits during construction. The Architect and Civil Designer shall make at least 3 site visits; the Structural, Mechanical, Electrical Designers shall make at least 2 site visits; and the Fire Protection and Communication Designers shall make at least 1 site visit.

1.3 CONTRACTOR DESIGN REQUIREMENTS AFTER AWARD

1.3.1 The Contractor must submit for Government Acceptance, a Design Quality Control Plan as required in Section 01 45 00, before design may proceed. The Design Quality Control Plan must indicate the designer's integral role throughout design and construction. Resumes of each designer of record shall be included to demonstrate compliance with the RFP requirements. A list of designers, checkers, and independent reviewers must be included to demonstrate professional registration and three separate individuals working per discipline.

1.3.2 The Contractor shall conduct Independent Technical Reviews, in accordance with requirements in Section 01 45 00.

1.3.3 After Award, the contractor shall provide the energy conservation strategies considered through the energy and life cycle cost analyses, and the guidelines of ASHRAE Standard 90.1. (See Section 01 02 00.00 48, Part 12.)

1.3.4 The Contractor shall design and detail a complete and usable facility before construction begins. **Fast track design and construction will not be permitted on this project.** Fast-tracking includes demolition, site work, ordering long-lead materials, and mobilization. The Contractor shall design and construct the facility in Imperial (English) units.

1.3.5 The design shall consist of six submittals, as described in the **Design Process and Submittal Requirements Manual** (Attachment in this RFP). These submittals are:

1. the Charrette Design,
2. the Revised Charrette Design,
3. the Interim Design,
4. the Final Design,
5. the Corrected Final Design,
6. and the Certified Final Design.

1.3.6 The Certified Final Design shall be submitted only when ALL review comments have been addressed, incorporated into the design, and the final design has been accepted, and is ready for construction. It shall include signatures on each sheet and professional stamps from each Designer of Record.

1.3.7 The design submittals shall include specifications, drawings, design analysis, SID, permit applications, confirmation notices and submittal registers. The government will assist the contractor in finalizing the final draft DD1354, however, it is the Contractor's responsibility to provide and complete the DD1354. The complete requirements for each submittal are described in the **Design Process and Submittal Requirements Manual -- Design Build -- Design Submittal Requirements After Award AND State of Delaware OMB/DFM project submission requirements**. This is referred to below as "DPSR Manual".

1.3.8 The design shall be completed in accordance with the applicable criteria identified or implied in this RFP and referenced documents. If at any time a comment or direction is provided that impacts the cost of the project or the contractor deems to be an additional service the contractor shall immediately notify the DEARNG contracting specialist in writing prior to initiating any work on that item.

1.3.9 A sample design schedule is provided in Section 01 04 00.00 48.

1.4 SUBMISSION OF DESIGN DOCUMENTS

1.4.1 The Contractor shall submit design documents with cover letter by overnight mail in accordance with the requirements of this section. The letter shall indicate the project name, and due date for comments. All drawings shall be half-size, unless otherwise noted. Specifications, submittal register, design analysis and other technical information shall be bound. The SID shall be submitted in separate binders as indicated in UFC 3-120-10.

1.4.2 The Predesign Meeting, the Charrette, and each Design Review Meeting shall be held at the DEARNG Armed Forces Reserve Center, New Castle, DE. Design review meetings will be held to discuss review comments on the Charrette, Interim, and Final submittals. The Design Project Manager is responsible for preparing and distributing meeting minutes for all meetings and conference calls during design. The meeting minutes will be distributed to the entire project delivery team within 10 days of a meeting and within 5 days of a conference call.

1.4.3 The Designers of Record are also required to hold individual meetings with the Users on their respective areas of responsibility. Meeting minutes will be provided to the entire project delivery team. The Communication/Electrical Designer is required to hold a separate meeting with the Users and personnel from the Army National Guard IT office. They shall discuss the IT requirements of the project. The discussions from this meeting shall be reflected in the Interim Design Submittal. Meeting minutes will be provided to the entire project delivery team. Any design issues which arise that are not addressed in the RFP shall be identified to the DEARNG Project Manager and the Project Engineer/Architect. A response will be furnished by the DEARNG, and if necessary, a change order will be issued.

1.4.4 Design Reviews shall not be taken as an approval and do not relieve the Contractor's responsibility for compliance with the RFP solicitation, codes, regulations, or other applicable criteria. Design reviews are considered Quality Assurance reviews, and may be performed by the A-E team which developed the RFP Solicitation package.

1.4.5 Once the Government has reviewed and accepted the contractor's final design, Contractor shall make no further changes to the accepted design without the written approval of the Contracting Officer's Representative. All costs for submitted variances, after Final Design Acceptance, shall be borne by the Contractor at no cost to the Government. For all requested design changes, complete submittals to all parties listed will be required for an additional review, in accordance with the procedures for original submittals stated above.

1.5 GENERAL DESIGN REQUIREMENTS

1.5.1 The Contractor is required to independently prepare and submit for Government Acceptance a complete Design. The Contractor's Design Professionals shall independently confirm and be responsible for the technical accuracy and adequacy of all aspects of the project design.

1.5.2 The project design process shall include the submittals listed in paragraph 1.3.

1.5.3 Document quantities and delivery addresses are specified at the end of this Section. Quantities and addresses apply for each submittal.

1.5.4 CADD and BIM Requirements

1.5.4.1 Prepare drawings using AutoCAD 2016 or Revit software and submit as-builts in AutoCAD 2016 format.

1.5.4.2 The drawings shall comply with the AEC CAD Standards. The Design Quality Control Plan shall assure all files appear identical and are error-free. Maintain the use of referencing, and do not create a single file with all of the graphics for one sheet in one file.

1.5.4.3 Prepare documents using AutoCAD or Revit Building Information Management (BIM) technology in accordance with current AEC Standards.

1.5.4.4 Provide a set of Native CADD files. This set will typically use reference files for floor plans, borders, etc. Unless specifically approved, all projects must provide for all files to be placed in one directory. All unnecessary reference files shall be detached, and all files attached for 'designer information' shall be labeled as such in the description field. Where a particularly complex project makes managing all CADD files in a single directory unmanageable, the designer may request permission for use of a more complex directory structure. The designer shall propose the structure, and identify how each individual directory will be used. Where this may result in mapping reference files across directories, the design shall indicate the method for controlling this mapping to prevent loss of files because of remote attachments. It is mandatory that when such a setup is used that mapped directory paths not be used for attachments. Variables shall be used so that project configurations can be created or system variables created for future users to properly view the files. A description of each variable and mapping shall be provided with electronic file submittals.

1.5.4.5 Provide in addition a set of drawing files in PDF format that may be viewed without using CADD software. PDFs shall display for viewing in landscape format. PDF format drawings files shall include a reference or Table of Contents file, which indexes all drawings so each drawing may be accessed from the one file. The reference file shall have bookmarks to each drawings sheet. Drawings shall be to full scale, and arranged to print to a correct scale, or on 11 by 17 paper.

1.5.4.6 Index: Provide a list of all drawings in the set of project drawings together with the name of the electronic file that contains the data for each drawing.

1.5.4.7 Submitted hard copy drawings must be plotted directly from the electronic PDF file.

1.5.5 Specifications and Reports. Provide project specifications in 3-Part CSI format. The complete specification including title sheet, table of contents, and all specification sections; must be assembled into a single electronic document in PDF format. Provide reports in Microsoft Word (version 2000 or later).

1.5.5.1 Provide independent page numbering for each specification section. The page number shall incorporate the specification section number (e.g. 08 11 13.00 06-1).

1.5.5.2 Submitted hard copy documents must be printed directly from the electronic file.

1.5.5.3 Provide submittal checklist and other report documents also in PDF format.

1.5.5.4 Division 00 and Division 01 specifications shall not be edited or reproduced and shall not be included with the technical specifications. Divisions 00 and 01 are contract requirements; therefore, can only be changed by contract modification

1.5.6 Electronic Data

1.5.6.1 Electronic data of all design documents must be provided at each submittal stage. Data shall be on CD ROM.

1.5.6.2 Interior signage is to be provided in Microsoft Excel spreadsheet.

1.5.7 Submittal Register: The contractor will be required to prepare a Submittal Register similar to Engineering Form 4288 identifying all construction submittals. Each submittal item shall be identified and coded in accordance with Section 01 33 00. A completed Submittal Register containing the information required in Engineering Form 4288, accepted by the Contracting Officer, will be required prior to commencement of construction. The designers are required to provide a Submittal Register.

1.5.8 LEED Project Requirements:

1.5.8.1 LEED Project Registration. All projects are required to be registered with the United States Green Building Counsel (USGBC), and the Government has obtained the registration. After contract award, the LEED registration will be transferred to the Contractor. The Contractor's Designer of Record (DOR) shall utilize the online LEED Letter Templates and develop the LEED Project Checklist for project documentation. The DOR shall provide additional documentation required by the LEED 3.0. Documentation Requirements and Submittal Checklist attached to Section 01 33 29. The additional documentation shall be uploaded in LEED Online with the applicable LEED Letter Templates. The DOR shall maintain the Project Administrator Role throughout project design and construction.

1.5.8.2 LEED Accredited Professional. A LEED Accredited Professional shall be required on the project team, and will ensure project design is in compliance with USGBC LEED requirements for the project, and be involved in the project throughout design and construction.

1.5.8.3 The DOR is responsible for editing and including LEED Documentation required by Section 01 33 29 in the design submittals. This will include a completed LEED Project Checklist. The DOR will be involved in any changes to the LEED Project Checklist during the construction.

1.5.8.4 Meetings: The following meetings will be held to ensure LEED Compliance:

The Preconstruction Meeting (possibly discussed at the Partnering meeting instead)
The Implementation Plan Meeting
The Precloseout (Redzone) Meeting
The LEED Validation Meeting

1.5.8.5 At the Precon Meeting, the DOR and LEED AP will provide a presentation to the DEARNG, Contractor, and Users about the requirements of the LEED Documentation Specification, and review the LEED Project Checklist the contractor is required to follow.

1.5.8.6 At the Implementation Plan Meeting, the DEARNG, Contractor and LEED AP shall meet to discuss the content of the Plan, to ensure compliance with the LEED requirements. The DOR shall participate by conference call.

1.5.8.7 At the Precloseout (Redzone) Meeting, all LEED credits and the LEED rating shall be discussed, and establish a plan to meet the final remaining credits. The DOR (PM and Architect) and AE LEED AP shall attend.

1.5.8.8 At the LEED Validation Meeting, the DEARNG, Contractor, and LEED AP shall meet to discuss any remaining LEED credits.

1.5.9 LEED/Energy Requirements: LEED NC (New Construction) Version 3.0: The LEED Minimum Energy performance prerequisite is met when the minimum requirements of ASHRAE 90.1 are met. Therefore, meeting the Energy Policy Act 2005 requirements automatically causes the LEED prerequisite to be met. The analysis used to meet the requirements for the Energy Policy Act 2005 may be used to satisfy the requirements for LEED Optimize Energy Performance credit. For compliance with the Energy Policy Act 2005, the percent energy reduction shall be calculated by subtracting the process and plug loads from the total energy usages for both the baseline and proposed buildings. The formula shall be as follows: $(\text{Baseline energy usage} - \text{Proposed energy usage}) / (\text{Baseline energy usage} - (\text{process} + \text{plug loads}))$. For determining LEED Optimize Energy Performance credit points, the percent energy reduction shall be calculated by applying the appropriate energy costs to the total energy usage for both the baseline and proposed buildings. The formula shall be as follows: $(\text{Baseline energy cost} - \text{Proposed energy cost}) / (\text{Baseline energy cost})$.

1.5.9.1 Summary Analysis: Provide a summary of the Energy Conservation analysis. The summary shall include the completed LEED Letter Template for LEED Optimize Energy Performance credit.

1.6 ADDITIONAL DESIGN AND INVESTIGATION REQUIREMENTS

1.6.1 Geotechnical Requirements and Responsibilities

1.6.1.1 The Contractor's team shall include a licensed professional geotechnical engineer to interpret the subsurface conditions and develop earthwork and foundation requirements and design parameters on which to base the Contractor's proposal. Subsequent to award, the Contractor is required to perform and provide a complete geotechnical exploration of the proposed site to develop the final design.

1.6.1.2 The geotechnical exploration shall be performed under the direction of a licensed professional engineer with at least 10 years experience specializing in geotechnical engineering. This exploration shall be the full responsibility of the Contractor and detailed requirements are outlined below. It is possible that site specific subsurface conditions encountered by the Contractor will differ from those appended herein. Therefore, it is the responsibility of the Contractor to conduct a meeting with the COR subsequent to completion and evaluation of his site specific geotechnical exploration to enumerate any differences encountered that are not consistent with the information provided herein. Should those differences require changes in the foundation type, pavement and earthwork requirements proposed with the bid that result in more cost, those changes shall be clearly outlined for the meeting.

1.6.1.3 Geotechnical Report – General - The Contractor's geotechnical report shall summarize the subsurface conditions and provide requirements for the design of appropriate foundations, floor slabs, retaining walls, embankments, and pavements. The report shall recommend the type of foundation system to be used, lateral load resistance capacities for foundation systems, allowable bearing elevations for footings, grade beams, slabs, etc. An assessment of post-construction settlement potential including total and differential shall be provided. Recommendations regarding lateral earth pressures (active, at-rest, passive) to be used in the design of retaining walls shall be provided. The report shall include the recommended spectral accelerations and Site Class for seismic design along with an evaluation of any seismic hazards and requirements for mitigation, if necessary. Calculations shall be included to support the recommendations for bearing capacity, settlement, and pavement sections. Supporting documentation shall be included for all design parameters such as Site Class, shear strength, earth pressure coefficients, friction factors, subgrade modulus, California Bearing Ratio (CBR), and pH tests, salinity tests, resistivity measurements, etc., required to design corrosion control and grounding systems. In addition, the report shall provide earthwork requirements, expected frost penetration, expected groundwater levels, requirements for dewatering and groundwater control, possible presence of any surface or subsurface features that may affect the construction of the project such as sinkholes, boulders, shallow rock, old fill, old structures, soft areas, or unusual soil conditions. Information shall be offered on the types of base course materials available in the area and design strengths. Also, the Contractor's geotechnical engineer shall recommend designs to account for site specific soil conditions including, but not limited to: expansive soils, shrinking soils, sinkholes, variable groundwater, seismic activity, and chemically or

radiologically active soils.

1.6.1.3.1 The final geotechnical evaluation report shall be prepared by the Contractor's licensed geotechnical engineer and submitted along with the first foundation design submittal. Requirements for the report are noted in Part 3 of Section 01 02 00.00 48. If fast track design is used, the geotechnical report shall be submitted as part of the first fast track submittal.

1.6.1.3.2 Certification: The Contractor and its professional geotechnical engineer consultant shall certify in writing that the design of the project has been developed consistent with the Contractor's final geotechnical report. The certification shall be stamped by the consulting professional geotechnical engineer and shall be submitted with the first design submission. If revisions are made to the initial design submission, a new certification shall be provided with the final design submission.

1.6.1.4 Geotechnical Report – Field Program - As a minimum requirement, Contractor borings shall be sampled with a splitspoon sampler in accordance with ASTM D-1586, with samples visually classified at 1.5 foot intervals in accordance with the Unified Soil Classification System (ASTM D 2487). The Contractor's geotechnical engineer shall implement alternative sampling and exploration methods as needed to develop the soil properties and design parameters required herein based on the soil and soil formations encountered. The depth to water shall be recorded. Standard Penetration Blow counts shall be recorded. A dated drilling log shall be provided for each boring drilled. Soils information obtained from field logs, laboratory tests and geologist's logs shall be presented on the contract drawings in the form of boring plan, final boring logs and explanatory notes. See the preliminary geotechnical report in Attachment A to Section 01 02 00.00 48 for examples of format and content of boring logs.

1.6.1.5 Geotechnical Report – Pavement Section - The Contractor's geotechnical report shall contain flexible and rigid pavement designs including design CBR and modulus of subgrade reaction, and the required compaction effort for subgrades. Information shall be offered on the types of base course materials available in the area and design strengths. Pavement designs over cohesive soil subgrades and soils with 15% or more passing the #200 sieve) require underdrain systems. Underdrains shall be provided according to analytical design analyses and applicable construction methods to collect and remove infiltration from beneath the pavement. Pavements shall be designed based on the anticipated loading frequency and vehicle types in Part 3 of Section 00 02 00.00 48.

1.6.1.6 The Contractor's geotechnical engineer shall determine whether slopes greater than 5% are required adjacent to building based on site shrink/swell soil characteristics.

1.6.1.7 If temporary construction dewatering is required due to a high water table, the Contractor shall prepare and present a dewatering plan. The Contractor is responsible for securing all necessary information for the design of the dewatering system.

1.6.2 Roof Design Requirements

1.6.2.1 Roof eaves shall be designed to resist wind uplift determined by ASCE 7 and snow loads; provide calculations. A C-shaped bent steel plate of minimum ¼” thickness shall be installed at the eave for attachment of gutters, eave cleats, and soffit construction.

1.6.2.2 If wood is used in a roof assembly (not allowed for metal roofs), it shall be treated, and any fasteners for or into the wood shall be stainless steel.

1.6.2.3 Metal roofs shall be designed in accordance with ASCE 7. Clip spacing and wind zone dimensions shall be determined by ASCE 7 and roof system ASTM E 1592 data, provide calculations. Lightning protection shall utilize mechanical fasteners; obtain roof manufacturer and installer verification that method of attachment will not void roof warranty. No wood is allowed in metal roof assemblies; all attachment shall be made to steel structure.

1.6.3 Lighting design - Provide emergency/egress lighting calcs which indicate minimum, average, and uniformity values for all applicable areas, to assure compliance with NFPA 101.

1.6.4 Exterior Wall Design

1.6.4.1 Exterior brick veneer walls shall have corrugated weeps installed directly above base flashing and at the top exterior course to allow thermal venting. Exterior cavity walls shall have through-wall flashing installed at all rake to high wall intersections.

1.6.4.2 Provide vapor transmission and dew point analysis to show adequate control of water vapor. Exterior walls shall have a dew point analysis stamped by a professional engineer or registered roof consultant. Vapor barrier location shall be included in the analysis if a vapor barrier is provided. Perm rating of air barrier, based on location in wall, shall be reported.

1.6.5 Energy Conservation Submittals - These paragraphs are intended to amplify the requirements in the Army National Guard Design Process and Submittal Requirements Manual.

1.6.5.1 Two buildings must be modeled using building simulation software: (a) a baseline building that would meet the minimum requirements of ASHRAE Standard 90.1-2004 Appendix G and (b) a proposed building utilizing the materials and methods proposed and required by this construction contract.

1.6.5.2 The following building simulation software is acceptable for use in calculating building energy consumption: Hourly Analysis Program (HAP) by Carrier Corp., TRACE 700 by Trane Corp., DOE-2 by US Department of Energy, EnergyPlus by DOD/DOE.

1.6.5.3 The calculation methodology used for this documentation and analysis shall follow the guidelines set forth in Appendix G of ASHRAE 90.1-2004, with two exceptions:

(a) the definition of the terms in the formula for Percentage Improvement found in paragraph G1.2 are modified as follows: Baseline Building Performance shall mean the annual energy consumption calculated for a building design intended for use as a baseline meeting the minimum requirements of the energy standard, and Proposed Building Performance shall mean annual energy consumption calculated for the proposed building design intended for construction.

(b) the formula in paragraph G.1.2 is modified as follows:

Percentage Improvement = $100 \times (\text{Baseline Building Performance} - \text{Proposed Building Performance}) / (\text{Baseline Building Performance} - \text{Receptacle and Process Loads})$

1.6.5.4 This calculation shall address all energy consuming systems in a single integrated methodology. Individual calculations for heating, cooling, power, lighting, power, etc. systems will not be acceptable.

1.6.5.5 At the Interim and Final Design, submittals which address energy consuming systems, (heating, cooling, service hot water, lighting, power, etc.) must include calculations which demonstrate and document compliance with the Energy Policy Act of 2005 and follow on rulings. As a minimum, to show compliance the following must be submitted:

1.6.5.5.1 A summary of the analysis shall be provided including a table indicating the energy-related features included in the design on which the performance rating is based. This table shall document all energy features that differ between the models used in the baseline building performance and proposed building performance calculations.

1.6.5.5.2 The output summary of the annual energy consumption for the baseline building performance and proposed building performance models for each facility under contract shall be presented to demonstrate compliance with these energy conservation requirements. Output summary shall breakdown the energy usage by at least the following components: lights, internal equipment loads, service water heating equipment, space heating equipment, space cooling equipment and heat rejection equipment, fans and other HVAC equipment such as pumps, and receptacle and process loads. The output reports shall also show the amount of time any loads are not met by the HVAC system for both the proposed and baseline building models.

1.6.6 Fire Protection Criteria: The Contractor is required to meet NFPA 70, Article 511 requirements. This will require physical separation between work areas and office areas for containment of fumes, or negative mechanical pressurization. This impacts location of electrical devices (receptacles, switches, etc.) in the work areas.

1.7 SUBMITTAL REQUIREMENTS

1.7.1 Design Phase: Design submission requirements are defined in the Design Process and Submittal Requirements Manual, - Design Build -- Design Submittal Requirements After

Award (referred to below as "DPSR Manual"), ARNG DG 415-5, and State of Delaware OMB/DFM submission requirements. Each discipline is provided the requirements for the Charrette, Interim, Final, Corrected Final Design, and Certified Final Design Submittals. All aspects will be followed. Design the project in AutoCAD matching the version of the project CD provided by the government. If no CD is provided, use the latest version of AutoCAD.

1.7.2 The Pre-Work (Pre-Design) Meeting is an opportunity for the Government Project Engineer/Architect and the D/B Work design team to review the project requirements. A review of Sections 01 02 00. 00 48, 01 03 00.00 48, and 01 04 00.00 48 would assure the designers understand the requirements and expectations of the design process. This is also an opportunity for the contractor, DEARNG construction personnel, and the Project Manager to meet and go over project requirements. The design schedule should be discussed and the first few meeting dates need to be established.

1.7.3 The **Charrette Design** is defined in **DPSR Manual**. The deliverables for this phase are also described in the Manual, these requirements are in addition to State of Delaware OMB/DFM requirements and also include a Design Analysis. The Charrette is an opportunity to improve the design proposal documents at no increased cost. There are areas in the building that could be rotated/shifted/move walls, which would greatly improve the functionality of the facility. The designer should provide attention to detail regarding the building entrance, lobby, and restrooms.

- Capture the outcome of the Charrette Meeting in a Charrette Report consisting of minutes, revised drawings, and updated narrative and submit for the record in the time frame called for in the schedule.
- A conference call will be scheduled approximately five days after the Charrette Report to discuss the Report. A direction to proceed with subsequent design based on the agreed charrette report will be provided after the conference call.
- Provide a **Revised Charrette** Document to all parties-
- The decisions from the Revised Charrette Conference Call will be incorporated into the Interim Design Submittal.

1.7.4 The **Interim Design** Phases is defined in the **DPSR Manual**. **The deliverables for this phase are also described in the Manual in addition to State of Delaware OMB/DFM requirements.** This submittal shall incorporate the review comments from the charrette design phase. **Interim Design** Phase will include:

- Interim ("60%") Design for architecture, structural, interior design, civil, mechanical and electrical systems.
- For projects employing fast-track provide (100%) design for building site design to include: building/area site layout, final grade elevations, site electrical, mechanical and civil utilities, permits,
- Design Analyses
- Provide a list of required permits for the project; including requirements and process for obtaining each permit, associated costs, and status of permit acquisition.

1.7.5 Final Design Phase

1.7.5.1 The **Final Design** Phases is defined in the **DPSR Manual**. **The deliverables for this phase are also described in the Manual.** This submittal shall designate what equipment manufacturers the contractor plans to use for all pieces of equipment. This submittal shall incorporate the review comments from the Interim Design phase.

1.7.5.2 The **Final Design** Phase will include:

- Corrected Final (100%) Design for building site design to include: building/area site layout, final grade elevations, utility locations, revised complex entrance, parking, and associated roadways.
- Final (100%) Design for all remaining architecture, structural, interior design, civil, mechanical and electrical systems.
- Provide a list of required permits for the project; including requirements and process for obtaining each permit, associated costs, and status of permit acquisition.

1.7.6 The Corrected Final Design Phase is defined in the **DPSR Manual**, **The deliverables for this phase are also described in the Manual.** This submittal shall incorporate the review comments from the Final Design phase.

1.7.6.1 For the "Civil/Site Work" Corrected Final: The designer is responsible to respond to all comments and incorporate all appropriate comments (as determined by the DEARNG Project Manager), generated as a result of the final review meeting. As part of the **Backcheck**, the designer shall mark three sets in red, with the reviewer's name and comment number, indicating the corrections have been made as a result of the review comment. The DEARNG, and at the governments discretion the RFP preparer/reviewer, will perform a backcheck of comments on these red-lined sets. Once all comments are satisfactorily resolved, the Certified Final Design may be distributed.

1.7.6.2 The Corrected Final design phase will include:

- Corrected Final (100%) Design for all remaining architecture, structural, interior design, civil, mechanical, and electrical systems.

1.7.6.3 The Corrected Final Design Phase is defined in the **DPSR Manual Part C**. **The deliverables for this phase are also described in the Manual.** This shall be considered a formal submittal to reviewers. This submittal shall incorporate the review comments in the submittal and become the final product for construction.

1.7.7 Certified Final - For the "Building" Certified Final: The designer is responsible to respond to all comments and incorporate all appropriate comments (as determined by the DEARNG Project Manager), generated as a result of the final review meeting. As part of the **Backcheck**, the designer shall mark three sets in red, with the reviewer's name and comment number, indicating the corrections have been made as a result of the review comment. The DEARNG, and the RFP preparer (at the governments discretion) will perform

a backcheck of comments on these red-lined sets. Once all comments are satisfactorily resolved, the Certified Final Design may be distributed. The designer shall provide a copy of each reviewer's backcheck corrected final drawings and specifications, demonstrating the comments have been incorporated. This can be accomplished in hard copy or on CD with PDF files of the changes.

1.7.8 Structural Interior Design (SID) Submittals – SID is defined in the **DPSR Manual and UFC 3-120-10 Interior Design. The deliverables are also described in the Manual and UFC.**

1.7.8.1 Not Used

1.7.8.2 Note: The furniture will be GFGI (government furnished-government installed). The contractor will be responsible for all power, data, and voice hookups.

1.8 DESIGN REVIEW

1.8.1 Government review comments will be provided in spreadsheet format or annotations on drawings. The Contractor will be given access to this system and will be required to respond to all comments in the spreadsheet. Comment responses shall be entered before each review meeting, so the Project Team can discuss open issues and non-concur comments – not each individual comment. The Contractor shall print and distribute review sets as shown on the attached list and be prepared to discuss the comments and preliminary responses at the review meeting for each part of the design. The Contractor will keep the minutes of the meetings and forward the minutes and annotated comments to all reviewers within 14 days of the meeting. The annotations will be detailed enough to indicate exactly what the Contractor will do to comply with the comments. The contractor shall assemble the comments received into a complete package. The complete package of comments and responses shall be transmitted to all offices that received the design submitted.

1.8.1.1 The Government's review is not to be considered a quality control review; the contractor shall provide his own internal quality control as required by contractor Design Quality Controls Plan before the design is submitted to the Government. It is very important the Contractor's entire team agrees with the design before it is submitted to the Government. The Government's review or acceptance does not relieve the contractor of his responsibility to provide a safe, functional project in accordance with the terms of the contract. All final drawings shall be signed and sealed by the Design Professional. Quality control procedures shall consist of design and/or checking by registered professionals and a review completed by a separate professional. Complete names of designers, checkers, and reviewers shall appear in the drawing title block. The Contractor shall submit the Design Checklist from DG 415-5.

1.8.1.2 The Government's review will likely result in a significant number of comments. The Contractor shall respond to each comment with a response that clearly indicates what action will be taken. Comments that, in the Contractor's opinion, require effort outside the scope of the contract will be clearly indicated as such by the Contractor. The Contractor shall not proceed with work outside the contract until a modification to the contract is properly executed.

1.8.2 The minimum design review times shall be as follows: Charrette - 14 days; Interim 60% - 14 days; Final 100% - 21 days; Corrected Final - 14 days.

1.9 CONSTRUCTION PHASE

1.9.1 The construction phase will begin with a Letter of Design Completion, and release for construction will be issued upon completion and acceptance of the corrected final design submittal. This will provide authorization begin onsite construction efforts.

1.9.2 The first item of work during the construction phase, the Contractor shall furnish to the Government 12 half-size sets and 5 full size sets of the certified final drawings, 5 sets of the accepted specifications, and 5 CDs for its use during construction. The DEARNG will finalize this list and provide the actual list of personnel to receive this material when it is time to be reproduced. The Construction CD's will include 5 file folders – one folder containing native AutoCAD or Revit drawing files, one folder containing native specification section files, one folder containing PDF drawing files, one folder containing one large PDF file of the specifications, and one folder containing one large PDF file of the Design Analysis.

1.9.3 No construction will be allowed on work for which the design has not been reviewed and accepted.

1.9.4 The Contractor shall provide artistic renderings of the project, as specified in the attachment, no later than 90 days after design completion.

LIST OF ADDRESSES FOR REVIEWS

ORGANIZATION	ABBREVIATION	COPIES		
		(1)		SID
DEARNG - CFMO ATTN: Marc Orndorff 1 Vavala Way New Castle, DE 19720	DEARNG/CFMO	3 and 1 CD		2
Tetra Tech Attn: Chuck Dobbs 240 Continental Dr, Suite 200 Newark, DE 19713	A/E Firm	2 and 1 CD		1
Army National Guard Readiness Center ATTN: ARNG-ILI-C (Doug Patterson) 111 South George Mason Drive Arlington, VA 22204	NGB	1 and 1 CD		1
RRC-JGMS JV (Mike Keller) 1408 Hague Drive SW Leesburg, VA 20175	NGB	1		0
Concord Engineering Attn: Chris Sylvia 3020 Market Street, Suite 103 Philadelphia, Pa. 19104	CxA	1		0

1. All addressees shall receive the following documents:

Charrette Design Submittal, Revised Charrette Documents (drawings only), Interim Design Submittal, and Final Design Submittal. All document sets shall be printed plans, specifications, and design analyses; and electronic files of the complete submittal also provided on CD in the quantity identified. SID binders will be provided at submissions as outlined in UFC 3-120-10. Each document set shall include

- (a) A CD with all design files. (Specs in one PDF file, DA in one PDF file, and drawings in a third file in full-size PDF format). The beginning of each section of the DA shall be bookmarked. The start of each spec section shall be bookmarked. Each drawing sheet shall be bookmarked.
- (b) Printed half size plans.

2. The original certified final will be submitted to DEARNG, with signatures and stamps, as required. Copies as indicated in Part 3 paragraph "SUBMITTAL REQUIREMENTS", subparagraph "Construction Phase" above will be distributed to the government design team and field office, by overnight mail.

<p>Project:</p> <p style="text-align: center;">For Design/Build Projects Final Design and Certified Final Design Checklist <i>(Edit as needed)</i></p>	
<p>1. <u>GENERAL:</u></p>	
a. Have all documents been prepared in accordance with the Design QC Plan?	
b. Have drawings and specifications been coordinated between engineering disciplines?	
c. Have drawings and specifications been checked; and have drawings been initialed by reviewer and designer?	
d. Have drawings and specifications been reviewed by a qualified engineer to assure fire protection engineering is in conformance with applicable portions of NFPA regulations and national, state, and local building codes?	
e. Are drawings, design analyses, etc., signed and dated?	
f. Are Government review comments on the charrette and interim design submittals annotated and incorporated into final drawings and specifications?	
g. Are annotated review comments included in each design analysis package	
h. ITR certification sheets signed and included?	
i. Have the energy conservation strategies considered through the energy and life cycle cost analyses been provided in the design analysis (spec 010300.0048, par. 3.1.3)? (Applies to building design only)	
<p>2. <u>DRAWINGS:</u></p>	
a. Has CADD quality been checked to assure legible reproduction?	
b. Does location plan include location of borrow pits, disposal areas, areas for contractor's office and storage, haul routes, location of Resident/Area Engineer and DEH office?	
c. Have signature blocks been properly prepared?	
d. Has Quality Control Procedures been performed to assure that translated files are fully useable, complete and represent the design	
<p>3. <u>SPECIFICATIONS:</u></p>	
a. Were latest guide specifications used?	
b. Are specifications prepared in accordance with the RFP?	

c. Name of person supervising specifications preparation:	

4. MISCELLANEOUS:	
a. Have construction permits been applied for as required by the Clean Air Act and Clean Water Act Amendments? Or other permits required?	
b. Has the Certified Final submittal been made in accordance with every requirement of the RFP? (If not, explain deviations on a separate sheet attached to this form.)	
c. Has the CID/SID been completed? Were full size drawings and the required native CADD files provided with the binders? (Applies to building design only)	

SIGNATURE AND DATE	

SECTION 01 04 00.00 48

THE DESIGN/BUILD PROCESS

1.1 DESIGN/BUILD (DB) PROCESS

The facility shall be designed and built by a single firm or team of firms (referred to as the Contractor or Design-Build Contractor) that has registered Architects and Engineers employed by or subcontracted to their organization.

1.2 PROPOSAL PHASE

The Proposal Phase includes the period from the time of issuance of the Request for Proposal (RFP) through the selection process and the final award of the contract to the successful Offeror. Schedules below begin at the point of contract award.

1.3 DESIGN PHASE

During the Design Phase, the Contractor shall develop and submit for review and acceptance the Charette, Revised Charrette Document, Interim, Final, Corrected Final, and Certified Final Design Submittals. Once the Certified Final has been received and accepted by the Government for the demolition work portion of the project, the Contractor will be given acceptance to start construction on the demolition work to fast-track construction. Note that no more than 30 days shall be permitted between completion of demolition and start of construction. In addition, notice shall be provided 30 days in advance of the planned demolition start date to allow the DEARNG to relocate from the existing vehicle maintenance facility. The demolition package shall include relocation and reconnection of utilities for the HAZMAT shed to allow the DEARNG to maintain operations.

1.4 CONSTRUCTION PHASE

A letter of authorization will initiate the Construction Phase, which should normally occur within two weeks of Design Phase acceptance. With the correct documentation in place, the Contractor may be released for demolition (if any) before the fast-track certified drawing submittal is completed.

1.5 SAMPLE DESIGN PHASE SCHEDULE

The sample schedule and sequence of work shown below was prepared by the Government for the Contractor's use in its schedule preparation. The schedule demonstrates a satisfactory two step fast tracked approach. This schedule is not intended to be the actual awarded design-build schedule. Upon receipt of the Notice to Proceed, the selected Contractor will be required to submit its proposed design and construction schedule in accordance with Section 01 32 01.00.10, Project Schedule, based on their resources and approach for this project. Government performance and review periods can not be altered in the Contractor's proposed schedule which will be submitted for government review and acceptance. A Pre-work Conference is required for this contract.

SAMPLE PROJECT DESIGN SCHEDULE FOR 490 DAY CONTRACT DURATION

<u>PROJECT SCHEDULE:</u>	<u>Duration</u>	<u>Calendar Days</u>
Notice to Proceed		Approx 14 days after Award
Design Quality Control Plan submitted	10	10 days after NTP
Pre-Work Conference, 2 days	10	10 days from NTP
Charette Design Submittal Due	10	20 days from NTP
2 to 3-Day Charette Meeting	05	25 days from NTP
Revised Charette Design Submittal Due	10	35 days from NTP
Revised Charette Design Conference Call	05	40 days from NTP
Interim & Fast Track Design Submittal	28	68 days from NTP
Interim & Fast Track Review Meeting (2-day meeting)	14	82 days from NTP
Red-Lined Corrected Final for Fast Track Design Due	14	96 days from NTP
DEARNG performs Backcheck on Fast-Track	14	110 days from NTP
A/E makes final Fast Track corrections & All comments closed	07	117 days from NTP
A/E submits signed & sealed Fast Track Hard Copy Plans & Specs – Ready for Construction	07	124 days from NTP
DEARNG Construction Office sends letter for Fast-Track Release for Construction	05	129 days from NTP
Final Design Submittal Due (60 days from Interim Review Meeting)	60	142 days from NTP
Final Design Submittal Review Meeting (one day meeting)	25	167 days from NTP
Red-Lined Corrected Final for Final Design Due	15	182 days from NTP
Government performs Backcheck on Final	15	197 days from NTP
A/E makes final corrections & All comments closed	10	207 days from NTP

A/E submits signed & sealed Certified Final Hard Copy Plans & Specs – Ready for Construction	08	215 days from NTP
Construction Office sends letter for Final Design release for construction	05	220 days from NTP
Construction Completion		490 Days from NTP

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SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for products selected under an allowance.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

- b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

B. Quality Assurance

1. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Substitution request is fully documented and properly submitted.
- c. Requested substitution will not adversely affect Contractor's construction schedule.
- d. Requested substitution has received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed unless otherwise indicated.

PART 3 - EXECUTION (Not Used)

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SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Division 01 Section “Allowances” for procedural requirements for handling and processing allowances.

1.3 MINOR CHANGES IN THE WORK

- A. The Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, “Architect’s Supplemental Instructions”.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by the Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change. Refer to procedures outlined in the *Supplementary Conditions* of the Contract.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Architect. Refer to Procedures outlined in the *Supplementary Conditions* of the Contract.

1.5 ALLOWANCES

- A. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor’s handling, labor, installation, overhead, and profit. Submit claims within 14 days of receipt of

the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 21 days after such authorization.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, the Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Work Change Directive: The Architect may issue a Work Change Directive on AIA Document G714. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 01 21 00 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 01 22 00 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 4. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract as described in Section 01 10 00 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

- a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect/Engineer and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application for Payment Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in Project Manual.

- F. Application for Payment Forms: Use forms acceptable to Architect/Engineer and Owner for Applications for Payment. Submit forms for approval with initial submittal of schedule of values.
- G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect/Engineer will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- I. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect/Engineer by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- J. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.

3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- K. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- L. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Sustainable design submittal for project materials cost data.
 4. Contractor's construction schedule (preliminary if not final).
 5. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 6. Products list (preliminary if not final).
 7. Sustainable design action plans.
 8. Schedule of unit prices.
 9. Submittal schedule (preliminary if not final).
 10. List of Contractor's staff assignments.
 11. List of Contractor's principal consultants.
 12. Copies of building permits.
 13. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 14. Initial progress report.
 15. Report of preconstruction conference.
 16. Certificates of insurance and insurance policies.
 17. Performance and payment bonds.
 18. Data needed to acquire Owner's insurance.
- M. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

N. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT & COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Coordination Drawings.
 - 3. Administrative and supervisory personnel.
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Spec Section 01 77 00 “Closeout Procedures” for coordinating Contract closeout.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for the Owner and separate contractors if coordination of their Work is required.

- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of the Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
 - 1. Indicate relationship of components shown on separate Shop Drawings.
 - 2. Indicate required installation sequences.
- B. Staff Names: Within 15 days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at the Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to the Project.
 - 1. Post copies of list in the Project meeting room, in temporary field office, and by each temporary telephone.

1.5 PROJECT MEETINGS

- A. General: The Architectural/Engineering Consultant shall Schedule and conduct meetings and conferences at the Project site, unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify the Owner and the Contractor of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including the Owner and the Architect, within 3 days of the meeting.
- B. Preconstruction Conference: The Architectural/Engineering Consultant shall Schedule a preconstruction conference before starting construction, at a time convenient to the Owner and the Architect, but no later than 15 days after execution of the Agreement. Hold the conference

at the Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of the Owner, the Contractor, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing.
 - d. Designation of responsible personnel.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for processing Applications for Payment.
 - g. Distribution of the Contract Documents.
 - h. Submittal procedures.
 - i. Preparation of Record Documents.
 - j. Use of the premises.
 - k. Responsibility for temporary facilities and controls.
 - l. Parking availability.
 - m. Office, work, and storage areas.
 - n. Equipment deliveries and priorities.
 - o. First aid.
 - p. Security.
 - q. Progress cleaning.
 - r. Working hours.

C. Progress Meetings: The Architectural/Engineering Consultant shall conduct progress meetings at bimonthly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of the Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to the Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.

- 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
 - 14) Documentation of information for payment requests.
2. Reporting: The Architectural/Engineering Consultant shall distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- a. Schedule Updating: Revise the Contractor’s Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 13

COORDINATION OF TRADES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Applicable provisions of the entire Project Manual, including Addenda, shall govern this section as fully as if repeated herein.
- B. This section is for guidance only and does not relieve the Prime Contractor of the total responsibility for the proper completion of this work.

1.2 CUTTING AND PATCHING

- A. Refer to Section 01 73 29 “Cutting & Patching.”

1.3 ABANDONMENT, REMOVAL AND RELOCATION

- A. Prime Contractor and each Sub-Contractor shall perform all removal and relocation work related to their trade as required for installation of work installed for entire job and shall cooperate fully among themselves in these respects.
- B. Removals shown on drawings are a general indication only and may not necessarily indicate the full extent of removals which may be required to complete this work.
- C. The Prime Contractor shall seal all existing and resultant penetrations and voids and perform surface refinishing as required.
- D. Each Contractor shall provide, erect and maintain barricades, guards, bracing, shoring, etc. required for the protection of their workers, the occupants of the building and the General Public.
- E. During the course of this work, each Contractor shall, by means of canvasses, temporary partitions or otherwise as may seem expedient to them, protect the property and adjacent areas from damage, dirt and dust.
- F. All demolition work is subject to the direction and approval of the Owner and Engineer and shall be performed in such manner as not to interfere with the normal operation of the building involved.
- G. Where work under this contract interferes with the existing construction, piping, conduit, fixtures or equipment, remove the existing construction, piping, conduit or equipment and reroute to clear the obstruction providing additional piping and conduit, if necessary, of the same design and quality if the material, piping or conduit are to be continued in use.
- H. Disconnect and remove all accessible piping, conduit, ductwork, materials, fixtures and equipment not required in the new systems. Plug all outlets at the main or riser connection.

- I. Removed materials not desired by the Owner or not to be reset and not specified nor indicated to be reused, shall become the property of the Contractors and shall be promptly removed from the site. Refer to Spec Section 01 74 19 “Construction Waste Management & Disposal” for trash removal.

END OF SECTION

SECTION 01 31 20
PAYROLL REPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for schedules and reports required for proper performance of the Work, including:
 - 1. State of Delaware Payroll Reports.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 01 Section "Applications for Payment" specifies requirements for submittal of the Schedule of Values.
 - 2. Section 01 31 00 "Project Management & Coordination" for "Project Meetings" specifies requirements for submittal and distribution of meeting and conference minutes.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of schedules and reports with performance of other construction activities.

1.4 PAYROLL REPORTS

- A. State of Delaware Payroll Reports: As required by the State of Delaware, Section 6960, Title 29, of the Delaware Code, payroll wages shall be reported weekly to the Delaware Department of Labor, Division of Industrial Affairs, 4425 North Market Street, Wilmington, DE 19802, phone 302-761-8200. Forms shall be available at the above address. A sample copy of the form is attached under contract forms, State of Delaware Payroll Report.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

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SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

- 1. Preliminary Construction Schedule.
- 2. Contractor's Construction Schedule.
- 3. Submittals Schedule.
- 4. Daily construction reports.
- 5. Material location reports.
- 6. Field condition reports.
- 7. Construction photographs.

- B. Related Sections include the following:

- 1. Section 01 29 00 "Payment Procedures" for submitting the Schedule of Values.
- 2. Section 01 31 00 "Project Management and Coordination" for submitting and distributing Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
- 3. Section 01 77 00 "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

- 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
- 2. Predecessor activity is an activity that must be completed before a given activity can be started.

- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Major Area: A story of construction, a separate building, or a similar significant construction element.
- G. Milestone: A key or critical point in time for reference or measurement.
- H. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.4 SUBMITTALS

- A. Qualification Data: For firms and persons specified in “Quality Assurance” Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
- C. Contractor’s Construction Schedule: Submit three printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.
- D. CPM Reports: Concurrent with CPM schedule, submit three printed copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.

- E. Daily Construction Reports: Submit two copies at weekly intervals.
- F. Material Location Reports: Submit two copies at weekly intervals.
- G. Field Condition Reports: Submit two copies at weekly intervals.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

1.6 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 15 days after date established for the Notice to Proceed.
 - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 3. Use "one workday" as the unit of time.

- B. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Purchase of materials.
 - c. Delivery.
 - d. Fabrication.
 - e. Installation.
 2. Processing: Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. High and low temperatures and general weather conditions.
 5. Accidents.
 6. Meetings and significant decisions.
 7. Unusual events (refer to special reports).
 8. Stoppages, delays, shortages, and losses.
 9. Meter readings and similar recordings.
 10. Emergency procedures.
 11. Orders and requests of authorities having jurisdiction.
 12. Change Orders received and implemented.
 13. Construction Change Directives received.
 14. Services connected and disconnected.
 15. Equipment or system tests and startups.
 16. Partial Completions and occupancies.
 17. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION (not used)

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SECTION 01 33 01

CADD RELEASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Related Sections include the following:

1. Section 00 62 93 “Use and Indemnification Agreement”, used for release request of CAD files from Architect/Engineer.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - PART 3 - EXECUTION

3.1 USE AND INDEMNIFICATION AGREEMENT

A. Instructions:

1. Tetra Tech does not charge contractor(s) for electronic files (this applies to files in AutoCAD (or similar) format) because the Contractor is required to provide electronic as-built drawings from these files.
 - a. PDF’s, which are simply an electronic scan of the drawings, do not require the use of the indemnification form.
2. For AutoCAD type files, the Use and Indemnification Agreement is to be signed by the Prime Contractor. Should a subcontractor, such as a steel fabricator, ductwork detailer, desire electronic files, they would need to pursue this request through their Prime Contractor who has the contract with the Client.

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SECTION 01 33 05

SUBMITTAL PROCEDURES AND REQUIREMENTS

PART 1 - GENERAL

1.1 SECTIONS INCLUDES

- A. Administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Contractor's and Engineer's duties and responsibilities.
- C. Submission Requirements: As required by the Contract Documents for all materials, products, equipment and systems to be furnished and installed under this Contract, unless specifically indicated otherwise.
- D. Action Submittal and Informational Submittal: Description of submittal review dispositions and resubmissions.

1.2 RELATED SECTIONS

- A. Section 01 25 00 "Substitution Procedures"
- B. Section 01 31 00 "Project Management and Coordination"
- C. Section 01 32 00 "Construction Progress Documentation"
- D. Section 01 40 00 "Quality Requirements"
- E. Section 01 77 00 "Closeout Procedures"
- F. Section 01 78 23 "Operation and Maintenance Date"
- G. Sections for Divisions 02 through 46—Required Submittals

1.3 DEFINITIONS

- A. Contractor's Registered Design Professional (RDP): An individual representing the Contractor or his suppliers or subcontractors who is licensed to practice engineering as defined by the statutory requirements of the professional licensing laws in the state or jurisdiction in which the project is to be constructed.
- B. "Or-Equal" Items: Material or equipment proposed by Contractor that is functionally equal to that named and sufficiently similar so that no change in related Work will be required.
- C. Product Data: Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

- D. Samples: Physical examples that illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.
- E. Shop, Fabrication and/or Layout Drawings: Shop Drawings are drawings, diagrams, schedules, and other data specifically prepared for the Work by the Contractor, subcontractor at any tier, manufacturer, supplier or distributor, to illustrate some portion of the Work.
- F. Submittals: Documents or materials submitted to the Engineer for review prior to installing the materials, products or components into the Work, as noted below:
 - 1. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer’s responsive action.
 - 2. Informational Submittal: Written information submitted by Contractor that may not require Engineer’s review and disposition.
 - 3. Submittals may be rejected for not complying with the terms and conditions of the Contract and project-specific requirements
- G. Substitutions:
 - 1. A request for use of an alternative material, equipment or procedure which is different than shown in the documents that provides performance equivalent to what is shown in the documents
 - 2. Submit under provisions of Section 01 25 00 “Substitution Procedures”

1.4 GENERAL

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the specification or description is intended to establish the type, function, appearance, and quality required.
- B. Unless the specification or description contains or is followed by words reading that no like, no equivalent, or no “or-equal” item or no substitution is permitted, other items of material or equipment of other suppliers may be submitted to Engineer for review.
- C. Product or equipment substitution requests must meet the same performance requirements as the specified product and are subject to review as a substitution and final disposition by Engineer per requirements of Section 01 25 00 “Substitution Procedures”.
- D. Construction Schedule: Designate in the construction schedule, or in a separate coordinated submittal registry/log or shop drawing schedule, the dates for submission and the dates that reviewed Action Submittals for Shop Drawings and Product Data are anticipated.
- E. Submittal Registry/Log: Within 15 calendar days from execution of Contract a complete registry/log of anticipated submittals shall be delivered to Engineer. This registry/log shall include all items of work that will require review, submittal disposition and other required comments before said materials, products, equipment or systems have been procured and/or delivered to the site.

1.5 SUBMITTALS

- A. Electronic Submittals:

1. Submittals shall, unless specifically accepted, be made in electronic format.
 2. Each submittal shall be an electronic file in Adobe Portable Document Format (PDF). Use the latest version available at time of execution of the Agreement.
 3. Electronic files that contain more than 10 pages in PDF format shall contain internal bookmarking from an index page to major sections of the document.
 4. PDF files shall be set to open “Bookmarks and Page” view.
 5. Add general information to each PDF file, including: Title, subject, author, and keywords. PDF files shall be text searchable (OCR’d).
 6. PDF files shall be set up to print correctly (legible and correctly sized) at 8.5-inch by 11-inch, 11-inch by 17-inch, or 22-inch by 34-inch. No other paper sizes will be accepted.
 7. Submit new and complete electronic files for each resubmittal.
 8. Include a copy of the Contractor’s Submittal Transmittal and Response form, or similar form with each electronic file. Contractor shall provide a sample form at Pre-Construction Conference.
 9. Include Contractor and Engineer authorization to reproduce and distribute each file.
 10. Detailed procedures for handling electronic submittals will be discussed at the preconstruction conference.
- B. Shop, Fabrication and/or Layout Drawings—Drawings shall be presented in a clear and thorough manner:
1. Identify details by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.
 2. Identify equipment by reference to equipment name and tag number shown on Contract Drawings.
 3. Scale and Measurements: Make drawings accurate to a scale with sufficient detail to show the kind, size, arrangement and function of component materials and devices
 4. Minimum sheet size: 8-1/2 inch by 11 inch.
 5. Fabrication/layout drawing size: 11 inch by 17 inch or 22 inch by 34 inch.
- C. Product Data—Preparation:
1. Clearly mark each copy to identify pertinent products or models submitted for review.
 2. Identify equipment by reference to equipment name and tag number.
 3. Catalog cut sheets: Cross-out or delete irrelevant data.
 4. Show performance characteristics and capacities.
 5. Show dimensions and clearances required for installation and maintenance.
 6. Show wiring or piping diagrams and controls.
 7. Show external connections, anchorages, and supports required.
- D. "Certificate of Compliance":
1. Provided by manufacturer or supplier in lieu of submittal data typically required, per Engineer’s written authorization or as scheduled herein.
 2. Certifies that product data or item identified in certificate is in total compliance with Contract Document requirements.
 3. Specifically identifies project name and that there is no deviation from Contract Documents.
 4. Identify equipment by reference to equipment name and tag number

5. Identify limits of equipment, materials or work provided.
 6. Provide for specific product data or item only as approved by Engineer or as indicated herein.
- E. Construction Schedule: Designate in the construction schedule, or in a separate coordinated shop drawing schedule, the dates for submission and the dates that reviewed Action Submittals for Shop Drawings and Product Data will be needed.
- F. Samples:
1. Copies: Two, unless otherwise specified in individual specifications.
 2. Preparation: Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:
 - a. Manufacturer name.
 - b. Model number.
 - c. Material.
 - d. Sample source.
 3. Manufacturer's Color Chart: Units or sections of units showing full range of colors, textures, and patterns available.
 4. Full-size Samples:
 - a. Size as indicated in individual specification section.
 - b. Prepared from same materials to be used for the Work.
 - c. Cured and finished in manner specified.
 - d. Physically identical with product proposed for use.
- G. Manufacturer's standard schematic drawings and diagrams:
1. Modify drawings and diagrams to delete information which is not applicable to the Work by crossing out or omitting irrelevant data.
 2. Supplement standard information to provide information specifically applicable to the Work.
- H. Field samples and mock-ups:
1. Contractor shall erect, at the Project site, at a location acceptable to Engineer.
 2. Size or area: That specified in the respective specification section.
 3. Fabricate each sample and mock-up complete and finished.
 4. Remove mock-ups at conclusion of Work or when acceptable to Engineer.
- 1.6 SUBMITTAL PROCEDURES
- A. General: Electronic copies of CAD Drawings of the Contract Drawings will be available for Contractor's reference in preparing submittals.

- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities:
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 3. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Identification:
1. Place a permanent label or title block on each submittal for identification.
 2. Indicate name of firm or entity that prepared each submittal on label or title block.
 3. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
 4. Include the following information on label for processing and recording action taken:
 5. Project name.
 6. Date.
 7. Name and address of Owner and Engineer.
 8. Name and address of Contractor.
 9. Name and address of subcontractor.
 10. Name and address of supplier.
 11. Name of manufacturer.
 12. Unique identifier, including revision number.
 13. Number and title of appropriate Specification Section.
 14. Drawing number and detail references, as appropriate.
 15. Other necessary identification.
- D. Confirmation of compliance with Contract Documents:
1. Unless a Certificate of Compliance is permitted for material or equipment where specified, provide the following documents to demonstrate compliance with the Contract Documents:
 - a. Copy of relevant Drawings with all addendum updates that apply to equipment or systems in Divisions 25, 26, 33, 44 and 46 marked to show specific changes necessary for equipment proposed in Contractor's submittal:
 - 1) If no changes are required, Drawing(s) shall be marked "no changes required".
 - 2) Failure to include copies of relevant drawings with submittal, whether changes are required or not, shall be cause for rejection of entire submittal with no further review by Engineer.
 - 3) Relevant Drawings include as a minimum control diagrams, process and instrumentation diagrams (P&IDs), and Process Drawings.
 - b. A copy of each pertinent specification section in Divisions 25, 26, 33, 44 and 46 with all addendum updates included, and all referenced and applicable specification sections, with their respective addendum updates included, with each paragraph check-marked to indicate specification compliance.
 - c. Otherwise mark to indicate requested deviations from specification requirements.

E. Identification of deviations from Contract Documents:

1. If Contractor proposes to provide material or equipment of work which deviates from the Contract Documents, indicate so under “deviations” on the transmittal form accompanying the submittal copies.
2. Identify all requested deviations as specified and on copies of specifications and Drawings.
3. Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
4. If deviations from specifications are indicated and, therefore requested by Contractor, the submittal shall be accompanied by a detailed, written justification for each deviation.
5. Failure to include a copy of marked-up specification sections, along with justification for any requested deviations to specification requirements, with the submittal shall be cause for rejection of the entire submittal with no further review by Engineer.

F. Transmittal:

1. Package each submittal individually and appropriately for transmittal and handling.
2. Engineer will discard submittals received from sources other than Contractor.
3. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
4. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
5. Transmittal Form: Submit sample transmittal form for approval or use the sample form at the end of this Section for transmittal of submittals. Include an 8-inch by 4-inch blank space for Contractor's and Engineer's stamps.
6. Electronically stamp cover sheet of each submittal as identified in letter of transmittal
7. Contractor's stamp: Initialed or signed, certifying review and approval of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents. Use stamp to include wording similar to the following:

CONTRACTOR 'S CERTIFICATION
**I CERTIFY THAT THIS SUBMITTAL HAS BEEN
REVIEWED AND APPROVED BY THE CONTRACTOR IN
ACCORDANCE WITH THE GENERAL CONDITIONS.**

BY _____

G. Submittal Registry/Log:

1. Maintain an accurate submittal registry/log for duration of the Work showing current status of all submittals.
2. Show submittal number, section number, section title, submittal description dates and disposition of submittal.
3. Make submittal registry/log available to Engineer for Engineer's review upon request.

- H. Unless specified otherwise, make submissions in groups to facilitate efficient review and approval:
 - 1. Include all associated items from individual specification sections to assure that all information is available for checking each item when it is received.
 - 2. Submit a complete initial submittal including all components when an item consists of components from several sources.
 - 3. Partial submittals may be rejected as not complying with provisions of the Contract
 - 4. Engineer will not be held liable for delays due to poorly organized or incomplete submittals.
 - 5. Do not include items from more than one specification section for any one submittal number.

 - I. Contractor may require subcontractors to provide drawings, setting diagrams and similar information to help coordinate the Work, but such data shall remain between Contractor and his subcontractors and will not be reviewed by Engineer unless specifically called for within the Contract Documents.

 - J. All submittals for each component of multi-component systems shall be compiled and submitted through the Contractor to the Engineer by the manufacturer having system responsibility.

 - K. Distribution: Forward final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

 - L. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.
- 1.7 DISPOSITION OF SHOP DRAWINGS AND PRODUCT DATA
- A. “No Exceptions Noted” – Acceptable with no exceptions noted:
 - 1. Electronic copy returned to Contractor for his use:
 - a. One hard copy to be kept on file at Contractor's office at job site
 - 2. No corrections or comments noted on submittal or in transmittal letter.
 - 3. Issues or miscellaneous comments pertaining to other related items of the Work may be included.
 - 4. Resubmission not required.

 - B. “Exceptions Noted – See Comments” – Acceptable with required exceptions/corrections noted:
 - 1. Electronic copy returned to Contractor for his use:
 - a. One hard copy to be kept on file at Contractor's office at job site.
 - b. Copies of submittal data in operation and maintenance manuals to be revised according to corrections.
 - 2. Comply with corrections or comments as noted on submittal and in transmittal letter.
 - 3. Resubmission not required.

 - C. "Revise And Resubmit" – Incorrect or specific information still required:

1. Copy of transmittal letter or submittal review comments sent to Contractor.
2. A submittal will be returned to Contractor upon resubmission and review completed per above disposition requirements
3. Submittal is either: incorrectly annotated; specific comments need to be addressed and incorporated in resubmittal; and/or additional information may be required as noted in transmittal letter or submittal review comments.
4. Submitted information may not include or address specific item required per the specification as identified in transmittal letter or submittal review comments.
5. Specific information related to identified item may be required for final approval of submittal
6. Resubmission of entire submittal may be required or resubmission of specific item may be required as identified in transmittal letter or submittal review comments.

D. "Rejected" – Returned for correction:

1. Copy of transmittal letter or submittal review comments sent to Contractor
2. Contractor required to resubmit complete submittal package in accordance with Contract Documents
3. Submittal does not comply with provisions of Contract Documents as noted in transmittal letter or submittal review comments
4. Resubmission required

E. "Receipt Acknowledged – For Information Only" – For general reference purposes only or for record copy:

1. Applicable to Certificates of Compliance, manufacturer and/or Contractor provided calculations, and other miscellaneous documentation not subject to Engineer review
2. Copy of transmittal letter or submittal review comments sent to Contractor
3. No further action: Detailed review and comment by Engineer not required
4. Resubmission not required

1.8 DISPOSITION OF SAMPLES

A. "No Exceptions Noted" – Acceptable with no exceptions noted:

1. One sample sent to Owner
2. One sample sent to Resident Project Representative
3. One sample retained in Engineer's file
4. Acknowledgment: Copy of transmittal letter or submittal review comments sent to Contractor
5. Resubmission not required

B. "Exceptions Noted – See Comments" – Acceptable with required exceptions/corrections noted:

1. One sample sent to Owner
2. One sample sent to Resident Project Representative
3. One sample retained in Engineer's file
4. Acknowledgment: Copy of transmittal letter or submittal review comments sent to Contractor
5. Work performed or products furnished to comply with exceptions noted in acknowledgment

6. Resubmission not required

C. "Rejected" – Returned for correction:

1. One sample retained in Engineer's file
2. Remaining samples sent to Contractor for resubmittal and compliance with the Contract Documents as noted in transmittal letter or submittal review comments
3. Copy of transmittal letter or submittal review comments sent to Owner
4. Resubmission required

1.9 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in submittals required by Engineer and resubmit until considered acceptable.

B. Clearly include identification of revisions on resubmissions.

C. Transmit each resubmission under new letter of transmittal. Use number of original submittal followed directly by a capital letter corresponding to the number of times a submittal is resubmitted (i.e., 1, 1A, 1B, etc.)

D. Shop Drawings and Product Data:

1. Revise initial Drawings or data and resubmit as specified for the initial submittal
2. Indicate any changes which have been made other than those requested by Engineer

E. Samples: Submit new samples as required for initial submittal

F. Reimbursement of Resubmission Review Costs:

1. Review of first submittal [and one resubmittal] will be performed by Engineer at no cost to the Contractor
2. Costs for review of subsequent resubmissions will be directly paid by Contractor
3. Engineer will document work-hours required for review and costs for Engineer review will be deducted from payments due Contractor as Change Order deducts
4. Charges for review of resubmissions will include Engineer at maximum rate of [\$175] per hour and Document Control/Submittal Clerk at maximum rate of [\$78] per hour

1.10 ENGINEER'S DUTIES

A. Review submittals with reasonable promptness and in accord with accepted submittal schedule provided that each submittal has been called for by the Contract Documents and is stamped by Contractor as indicated above:

1. In the event that Engineer will require more than 14 [21] calendar days to perform an expedited submittal review as requested by Contractor, Engineer shall so notify Contractor or indicate so on the submittal schedule
2. No extensions of time are allowed due to Engineer's delay in reviewing submittals unless all the following criteria are met:

- a. Contractor has notified Engineer in writing that an expedited review of particular submittal in question is critical to the progress of the Work and Contractor has identified the requested submittal return date
 - b. Engineer has failed to return submittal within 14 [21] days of receipt of the submittal or receipt of said notice, whichever is later
 - c. Contractor demonstrates that delay in progress of the Work was directly attributable to Engineer's failure to return submittal within 14 [21] days
3. No extensions of time are allowed due to delays in progress of the Work caused by rejection and subsequent resubmission of data, including multiple resubmissions
- B. Review drawings and data submitted only for general conformity with Contract Documents:
1. Engineer's review of drawings and data returned marked "No Exceptions Noted" or "Exceptions Noted" does not indicate a thorough review of all dimensions, quantities, and details of material, equipment device or items shown
 2. Engineer's review does not relieve Contractor of responsibility for errors, omissions or deviations nor Contractor's responsibility for compliance with the Contract Documents
 3. Engineer's review shall not extend to means, methods, techniques, sequences, operations of construction, and safety precautions and programs incidental thereto. No information regarding these items will be reviewed whether or not included in submittals
- C. Assume that no shop Drawing or related submittal comprises a deviation to the Contract Documents unless Contractor advises Engineer otherwise in writing which is acknowledged by Engineer in writing:
1. Consider and review only those deviations from the Contract Documents clearly identified as such in submittal and tabulated in the letter of transmittal
 2. At the discretion of Engineer, notify Contractor that review of specific deviations will be reviewed under provisions of Section 01 25 00 "Substitution Procedures"
- D. Return submittals to Contractor for distribution or for resubmission
- E. Transmit, unreviewed, to Contractor all submittals received directly from suppliers, manufacturers and subcontractors
- F. Transmit, unreviewed, to Contractor all submittals not called for by the Contract Documents or which have not been approved by Contractor
- G. Engineer will not review uncalled-for shop drawings or product data except by special arrangement
- H. Affix stamp and indicate submittal disposition or resubmission requirements with the following stamp:

Architect/Engineer's review of this submittal is only to determine if the items covered by the submittal will conform to the Contract Documents and be compatible with the design concept of the completed Project. Architect/Engineer's review does not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto. Architect/Engineer's review of this submittal does not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Architect/Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying this submittal. Contractor is responsible for complying with the requirements of the Contract Documents and is referred to the General Conditions for more detail regarding the Contractor's responsibilities for Submittals.

NO EXCEPTIONS NOTED	
EXCEPTIONS NOTED – SEE COMMENTS	
REVISE AND RESUBMIT	
REJECTED	
RECEIPT ACKNOWLEDGED – FOR INFORMATION ONLY	

Tetra Tech

By: _____ Date: _____

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 ACTION SUBMITTALS

- A. Confirm and comply with requirements of individual technical specifications for Divisions 02 through 46.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment:
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.

- f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data:
1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 22 by 34 inches.
- D. Coordination Drawings: Comply with requirements in Division 01, Section 01 31 00 “Project Management and Coordination”.
- E. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in Division 01, Section 01 40 00 “Quality Requirements” for mockups.
 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Engineer's sample where so indicated. Attach label on unexposed side that includes the following:
 - a. Generic description of Sample.
 - b. Product name or name of manufacturer.
 - c. Sample source.
 5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
 - a. Size limitations.
 - b. Compliance with recognized standards.
 - c. Availability.
 - d. Delivery time.
 6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
 - a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
 - b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
 7. Number of Samples for Initial Selection: Submit four (4) full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
 - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 8. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
- F. Product Schedule or List: Prepare a written summary indicating types of general products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product.
 2. Number and name of room or space.
 3. Location within room or space.
- G. Delegated-Design Submittal: Comply with requirements in Division 01, Section 01 40 00 "Quality Requirements" and per related technical specification.
- H. Submittals Schedule: Comply with requirements in Division 01, Section 01 32 00 "Construction Progress Documentation" and as specified herein.

- I. Contractor's Construction Schedule: Comply with requirements in Division 01, Section 01 32 00 "Construction Progress Documentation" for action.
- J. Application for Payments: Comply with requirements of Contract Documents and Division 01, Section 01 29 00 "Payment Process".
- K. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

3.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections:
 - 1. Certificates and Certifications: Provide a notarized statement that includes signature of Contractor, testing agency, or design professional responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of the company.
 - 2. Test and Inspection Reports: Comply with requirements in Division 01, Section 01 40 00 "Quality Requirements".
- B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and Owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

- I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.
- J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- N. Operation and Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 01, Section 01 78 23 "Operation and Maintenance Data".
- O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations:
 - 1. Include page numbers.
- P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.
 - 5. Required adjustments.

6. Recommendations for cleaning and protection.
- Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect and Owner or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits.

To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be

used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's Construction Schedule.

- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including Subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.10 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - e. When testing is complete, remove test specimens and test assemblies,; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor.

Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.11 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Payment for these services will be made from testing and inspection allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures & Requirements."
- F. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. **Associated Contractor Services:** Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. **Schedule of Tests and Inspections:** Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.
1. **Distribution:** Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in the Statement of Special Inspections attached to this Section, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected work.
- B. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections and in the Statement of Special Inspections attached to this Section, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.

- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 74 19 "Cutting & Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, may apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, Engineer, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Owner will not provide sewer-service for the project. Contractor shall provide all required temporary sanitary facilities.
- C. Water Service: Owner will provide on-site access to water service used by all entities for construction operations.
- D. Electric Power Service: Owner will provide on-site access to electric-power-service used by all entities for construction operations. Contractor shall furnish all necessary equipment to facilitate connection to power including coordination of permits with any inspection agency and or installation.
- E. Upon completion of the project and prior to demobilization the Contractor shall at his or her sole expense, remove any temporary utility service equipment and restore the service location to its pre-construction condition.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Dust-Control Plan: Submit coordination drawing and narrative that indicates the dust-control measures proposed for use, proposed locations, and proposed time frame for their operation.

Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. Waste handling procedures.
3. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in ADA-ABA Accessibility Guidelines.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Shall be set-up in the building.
- B. Keep office clean and orderly. Furnish and equip offices as follows:
 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 6 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
 3. Drinking water and private toilet.
 4. Coffee machine and supplies.
 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

- C. Storage or Fabrication Sheds: Provide sheds sized, furnished, and equipped or fenced around to accommodate materials and equipment for construction operations as needed for secure area for equipment.

- 1. Store combustible materials apart from building.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
- C. Obtain permission from Owner to use existing Heating and Cooling equipment. Change filters monthly. Provide a set of clean filters when done and two (2) sets of spare filters.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
 - 2. Area Available: Designated area as shown on Sheet CC-01.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed and remove prior to demobilization.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work if necessary, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work if needed. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- E. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- G. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install a minimum of one telephone line for each field office.
 - 1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 - 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- H. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
1. Processor: Intel Pentium D or Intel CoreDuo, 3.0 GHz processing speed.
 2. Memory: 4 gigabyte.
 3. Disk Storage: 300 gigabyte hard-disk drive and combination DVD-RW/CD-RW drive.
 4. Display: 22-inch LCD monitor with 256-Mb dedicated video RAM.
 5. Full-size keyboard and mouse.
 6. Network Connectivity: 10/100BaseT Ethernet.
 7. Operating System: Microsoft Windows XP Professional or Microsoft Windows Vista Business.
 8. Productivity Software:
 - a. Microsoft Office Professional, XP or higher, including Word, Excel, and Outlook.
 - b. Adobe Reader 7.0 or higher.
 - c. WinZip 7.0 or higher.
 9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
 10. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 384 Kbps upload and 1 Mbps download speeds at each computer.
 11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.
 12. Backup: External hard drive, minimum 40 gigabyte, with automated backup software providing daily backups.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Parking: Use designated areas of Owner's existing parking areas for construction personnel as directed.
- B. Project Signs: Provide Project signs as need and approved by the DEARNG. Unapproved signs are not permitted.
 1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project or directions to construction field office.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touchup signs so they are legible at all times.
- C. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements.
- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- F. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- G. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- H. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit by following applicable requirements as stipulated on the Erosion and Sediment Plan Sheets CE-01 to CE-04 approved by DNREC, including CCR if required by DNREC, or authorities having jurisdiction, whichever is more stringent and requirements.
- D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to Erosion and Sediment Plan Sheets CE-01 to CE-04 approved by DNREC and requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.

2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Stormwater Control: Comply with requirements of authorities having jurisdiction including DNREC and CCR, if required by DNREC. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by existing entrance gates at south entrance.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security of construction area by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- L. Temporary Partitions: If necessary provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 2. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.

- a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
 3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 4. Insulate partitions to control noise transmission to occupied areas.
 5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 6. Protect air-handling equipment.
 7. Provide walk-off mats at each entrance through temporary partition.
- M. Temporary Fire Protection: If necessary install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Items C, D, and E below apply only to existing facilities to remain.
- C. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- D. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.

4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- E. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use permanent HVAC system to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Change over from using temporary security and protection facilities to permanent facilities must occur before Demobilization and prior to Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove

materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 73 29

CUTTING & PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Divisions 03 through 09 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety. Operating elements include the following:
 - 1. Fire-suppression systems.
 - 2. Mechanical systems piping and ducts.
 - 3. Control systems.
 - 4. Communication systems.
 - 5. Conveying systems.
 - 6. Electrical wiring systems.

- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes: Administrative and procedural requirements for construction waste management activities.

1.2 DEFINITIONS

- A. Construction, Demolition, and Land clearing (CDL) Waste: Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and land clearing. Includes material that is recycled, reused, salvaged or disposed as garbage.
- B. Salvage: Recovery of materials for on-site reuse, sale or donation to a third party.
- C. Reuse: Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Crushing or grinding of concrete for use as sub-base material. Chipping of land clearing debris for use as mulch.
- D. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.
- E. Source-Separated CDL Recycling: The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.
- F. Co-mingled CDL Recycling: The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.
- G. Approved Recycling Facility: Any of the following:
 - 1. A facility that can legally accept CDL waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.
 - 2. Material Recovery Facility: A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures, are used to recover recyclable materials.
- H. Universal waste components (UWC) are as follows: electric motors, PCB ballasts, non PCB ballasts, capacitors, contactors, circuit breakers, elemental and liquid mercury containing articles, transformers, lead acid batteries, fluorescent light bulbs, and all HID light bulbs.

1.3 SUBMITTALS

- A. Contractor shall develop a Waste Management Plan: Submit 3 copies of plan within 14 days of date established for the **Notice to Proceed**.
- B. Contractor shall provide Waste Management Report: Concurrent with each Application for Payment, submit **3** copies of report.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Divert a minimum of **75%** CDL waste, by weight, from the landfill by one, or a combination of the following activities:
 - 1. Salvage
 - 2. Reuse
 - 3. Source-Separated CDL Recycling
 - 4. Co-mingled CDL Recycling
- B. CDL waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:
 - 1. Acoustical ceiling tiles
 - 2. Asphalt
 - 3. Asphalt shingles
 - 4. Cardboard packaging
 - 5. Carpet and carpet pad
 - 6. Concrete
 - 7. Drywall
 - 8. Fluorescent lights and ballasts
 - 9. Land clearing debris (vegetation, stumpage, dirt)
 - 10. Metals
 - 11. Paint (through hazardous waste outlets)
 - 12. Wood
 - 13. Plastic film (sheeting, shrink wrap, packaging)
 - 14. Window glass
 - 15. Wood
 - 16. Field office waste, including office paper, aluminum cans, glass, plastic, and office cardboard.

1.5 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED Accredited Professional, certified by the USGBC as waste management coordinator.
- B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

- C. Regulatory Requirements: Conduct construction waste management activities in accordance with hauling and disposal regulations of all authorities having jurisdiction and all other applicable laws and ordinances.
- D. Preconstruction Conference: Schedule and conduct meeting at Project site prior to construction activities.
 - 1. Attendees: Inform the following individuals, whose presence is required, of date and time of meeting.
 - a. Owner
 - b. Architect
 - c. Contractor's superintendent
 - d. Major subcontractors
 - e. Waste Management Coordinator
 - f. Other concerned parties.
 - 2. Agenda Items: Review methods and procedures related to waste management including, but not limited to, the following:
 - a. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - b. Review requirements for documenting quantities of each type of waste and its disposition.
 - c. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - d. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - e. Review waste management requirements for each trade.
 - 3. Minutes: Record discussion. Distribute meeting minutes to all participants.
Note: If there is a Project Architect, they will perform this role.

1.6 WASTE MANAGEMENT PLAN – Contactor shall develop and document the following:

- A. Develop a plan to meet the requirements listed in this section at a minimum. Plan shall consist of waste identification, waste reduction plan and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight throughout the plan.
- B. Indicate anticipated types and quantities of demolition, site-cleaning and construction waste generated by the project. List all assumptions made for the quantities estimates.
- C. List each type of waste and whether it will be salvaged, recycled, or disposed of in an landfill. The plan should included the following information:
 - 1. Types and estimated quantities, by weight, of CDL waste expected to be generated during demolition and construction.

2. Proposed methods for CDL waste salvage, reuse, recycling and disposal during demolition including, but not limited to, one or more of the following:
 - a. Contracting with a deconstruction specialist to salvage materials generated,
 - b. Selective salvage as part of demolition contractor’s work,
 - c. Reuse of materials on-site or sale or donation to a third party.
 3. Proposed methods for salvage, reuse, recycling and disposal during construction including, but not limited to, one or more of the following:
 - a. Requiring subcontractors to take their CDL waste to a recycling facility;
 - b. Contracting with a recycling hauler to haul recyclable CDL waste to an approved recycling or material recovery facility;
 - c. Processing and reusing materials on-site;
 - d. Self-hauling to a recycling or material recovery facility.
 4. Name of recycling or material recovery facility receiving the CDL wastes.
 5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on project site where materials separation will be located.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings in hauling and tipping fees by donating materials.
 7. Savings in hauling and tipping fees that are avoided.
 8. Handling and transportation costs. Including cost of collection containers for each type of waste.
 9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT, GENERAL

- A. Provide containers for CDL waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

- B. The collection containers for recyclable CDL waste must contain no more than 10% non-recyclable material, by volume.
- C. Provide containers for CDL waste that is disposed in a landfill clearly labeled as such.
- D. Use detailed material estimates to reduce risk of unplanned and potentially wasteful cuts.
- E. To the greatest extent possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.
- F. Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.

3.2 SOURCE SEPARATION

- A. General: Contractor shall separate recyclable materials from CDL waste to the maximum extent possible.

Separate recyclable materials by type.

1. Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water and to minimize pest attraction. Cover to prevent windblown dust.
3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from weather.

3.3 CO-MINGLED RECYCLING

- A. General: Do not put CDL waste that will be disposed in a landfill into a co-mingled CDL waste recycling container.

3.4 REMOVAL OF CONSTRUCTION WASTE MATERIALS

- A. Remove CDL waste materials from project site on a regular basis. Do not allow CDL waste to accumulate on-site.
- B. Transport CDL waste materials off Owner's property and legally dispose of them.
- C. Burning of CDL waste is not permitted.

3.5 UNIVERSAL WASTE DIVERSION

- A. Remove all universal waste from fixtures, panels, and related devices for proper diversion and reclamation.
- B. Store all universal waste in containers provided by contact person within facilities operations.
- C. Store all universal waste in a secured location and request periodic removal from assigned contact person.
- D. Exemption: electric motors, circuit breakers, transformers and lighting contactors are exempt from this provision provided the contractor chooses to salvage or reuse the components.
- E. No identified universal waste will be discarded into the waste stream.

END OF SECTION

WASTE MANAGEMENT PROGRESS REPORT				
MATERIAL CATEGORY	DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL	DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE		
		Recycled	Salvaged	Reused
1. Acoustical Ceiling Tiles				
2. Asphalt				
3. Asphalt Shingles				
4. Cardboard Packaging				
5. Carpet and Carpet Pad				
6. Concrete				
7. Drywall				
8. Fluorescent Lights and Ballasts				
9. Land Clearing Debris (vegetation, stumpage, dirt)				
10. Metals				
11. Paint (through hazardous waste outlets)				
12. Wood				
13. Plastic Film (sheeting, shrink wrap, packaging)				
14. Window Glass				
15. Field Office Waste (office paper, aluminum cans, glass, plastic, and coffee cardboard)				
16. Other (insert description)				
17. Other (insert description)				
Total (In Weight)		(TOTAL OF ALL ABOVE VALUES – IN WEIGHT)		
		Percentage of Waste Diverted	(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)	

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SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Delaware Department of Transportation (DelDOT) Standard Specifications.
- C. Delaware Department of Natural Resources and Environmental Control (DNREC) Erosion and Sediment Control Handbook.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
5. Submit test/adjust/balance records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

6. Advise Owner of changeover in heat and other utilities.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements, including touchup painting.
 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 3. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order.
 2. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. PDF electronic file. Architect will return annotated file.
 - c. Three paper copies. Architect will return two copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls" and Section 01 74 19 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

3.3 SUMMARY OF CLOSEOUT DOCUMENTS

- A. Certificate of Substantial Competition (AIA Document G704)
- B. Contractor's Affidavit of Payment of Debts and Claims (AIA Document G706)
- C. Contractor's Consent of Surety Company to Final Payment (AIA Document G707) (one copy)
- D. Contractor's Affidavit of Release of Liens (AIA Document G706A) (one copy)
- E. Copy of Letter of Guarantee and Warranty Information (three copies)
- F. Subcontractor's Release of Liens had been submitted with each previous Application of Payment (AIA Document G706A) (one copy)
- G. Affidavit of Discharge of State Tax Liability (Furnish an affidavit from the State Tax Department that all liabilities thereunder have been discharged by the Contractor and all subcontractors. (Delaware Division of Revenue)
- H. Operation and Maintenance Manuals (O&M)
- I. Final Payment Application
- J. Test and Balancing Reports
- K. Field Reports/Inspection Reports
- L. Design Review Summary's
- M. Meeting Minutes
- N. General Correspondences
- O. Record Shop Drawings and Submittals
- P. As-built Drawings: All construction changes should be clouded and marked.
 - 1. Updated CAD files to reflect changes and as-built conditions; AutoCadd dwg file 2010 to 2016 format.
 - 2. Three (3) hard copies of As-builts.
 - 3. Two (2) Sets of Drawing Disc updated with CAD files, Gold Foil, archival grade discs.
- Q. Copy of completed Final Punch List signed off by Owner's Rep.
- R. Punch List Closeout Letter
- S. Warranties (Letter of Guarantee and Warranty Info)
- T. Electrical Inspection Certificate
- U. Bond Certification

- V. Boiler Startup and Combustion Reports
- W. Certificate of Occupancy

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SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures and Requirements" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 01 91 13 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and Commissioning Authority will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit by uploading to web-based project software site. Enable reviewer comments on draft submittals.
 - 2. Submit three paper copies. Architect, through Construction Manager, will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.
- E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

- b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.

8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
 1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.

7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component

incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

- a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Engineer to provide OPR and BOD documentation to the Contractors.

1.2 SUMMARY

- A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components.

1.3 DEFINITIONS

- A. BOD: Basis of Design. A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- B. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- C. OPR: Owner's Project Requirements. A document that details the functional requirements of a project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
- D. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.4 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of each Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the Engineer.
- B. Members Appointed by Owner:

1. Representatives of the facility user and operation and maintenance personnel.
2. Architect and engineering design professionals.

1.5 OWNER'S RESPONSIBILITIES

- A. Provide the OPR documentation to each Contractor for information and use.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.
- C. Provide the BOD documentation, prepared by Engineer and approved by Owner, to each Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.6 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
 1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 2. Attend team meetings held on a biweekly basis.
 3. Integrate and coordinate commissioning process activities with construction schedule.
 4. Complete paper construction checklists as Work is completed and provide to the Engineer on a weekly basis.
 5. Complete commissioning process test procedures.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



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