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Middletown, DE 19709
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RGA No. 17051
13 June, 2018

ADDENDUM NO. 3

STATE OF DELAWARE OMB/DFM
OMB/DFM Contract No. MC3806000012
Sussex Violation of Probation – Security Upgrades
Sussex Community Corrections Center
23207 DuPont Blvd. Georgetown, De 19947

R G Architects
200 West Main Street
Middletown, DE 19709
Phone: 302-376-8100 (phone)
Fax: 302-376-9851 (fax)
Email: oscar@rgarchitects.net

BIDS DUE: ***2:00 p.m. local time on Thursday, June 21, 2018***

LOCATION: **THOMAS COLLINS BUILDING**
Division of Facilities Management Office
540 S. DuPont Highway, Suite 1 (Third Floor)
Dover, Delaware 19901
Attn: Mr. J Dean Seely

NOTICE TO ALL BIDDERS

1.0 GENERAL NOTES:

1.1 Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.

1.2 The following items are intended to revise and clarify the Drawings and Project Manual, and shall be included by the Bidder in their proposal.

1.3 Bidders shall verify that their Sub-bidders are in full receipt of the information contained herein.

1.4 A copy of the current bid set register is available upon request indicating individuals that have purchased project documents from R G architects.

1.5 All addenda will be sent out to the registered plan holders via email (or fax). Contractors are encouraged to keep an eye on their email accounts during the bidding period for such updates.

1.6 The owner has offered the contractors a tour of the facility, with the escort of the design team, on **Thursday, June 14, 2018 at 9:00 a.m.** Contractors who wish to attend are asked to complete their Security Clearance Forms (attached) and return them ASAP (in order to be approved on time) to Rick Ward at RichardW.Ward@state.de.us

2.0 Revisions to the SPECIFICATIONS

2.1 00 01 10 - TABLE OF CONTENTS.
2.2 00 41 13 - BID FORM.
2.3 01 23 00 – ALTERNATES
2.4 13 10 10 - BULLET RESISTANT EQUIPMENT
2.5 26 27 26 - WIRING DEVICES
2.6 27 05 26 - GROUNDING & BONDING FOR TELECOMMUNICATION
2.7 28 05 00 SECURITY & TELECOMMUNICATIONS RACEWAY

3.0 Revisions to the DRAWINGS

3.1 ASK-1 Alternate No.1 Window W-1 Plan
3.2 ASK-2 Alternate No.1 Window W-1 Elevation

4.0 Questions

4.1 Not at this time

6.0 ATTACHMENT LIST:

A. 00 01 10 - TABLE OF CONTENTS.
B. 00 41 13 - BID FORM.
C. 01 23 00 – ALTERNATES
D. 13 10 10 - BULLET RESISTANT EQUIPMENT
E. 26 27 26 - WIRING DEVICES
F. 27 05 26 - GROUNDING & BONDING FOR TELECOMMUNICATION
G. 28 05 00 SECURITY & TELECOMMUNICATIONS RACEWAY
H. ASK-1 Alternate No.1 Window W-1 Plan
I. ASK-2 Alternate No.1 Window W-1 Elevation

SECTION 00 01 10

TABLE OF CONTENTS

A. Specifications for this project are arranged in accordance with the Construction Specification Institute numbering system and format. Section numbering is discontinuous and all numbers not appearing in the Table of Contents are not used for this Project.

B. DOCUMENTS BOUND HEREWITH

DIVISION 00 – PROCUREMENT AND CONTRACT REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENTS

END OF SECTION

SECTION 00 01 10

BID FORM

For Bids due: **June 21st 2018 @ 2:00 p.m.** **To:** **OMB/DFM**
Thomas Collins Building
540 S. DuPont Highway, Suite 1 (3rd Floor)
Dover, DE 19901

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

(Other License Nos.): _____

Phone No.: ( ) _____ - _____ **Fax No.: ( ) _____ - _____**
_____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____
($)

ALTERNATES

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

ALTERNATE No. 1: Delete all work associated with window type "W-1" and work shown in detail 3 on sheet A20-1.

Deduct: _____
($)

ALTERNATE No. 2: Delete all work associated with security scope shown in plan 4 on sheet A31-1, including, but not limited to magnetic/electrical locks, wiring, and push buttons.

Deduct: _____
($)

BID FORM

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

	DEDUCT	ADD
~~UNIT PRICE No. 1: N/A~~	~~$~~	~~$~~
~~UNIT PRICE No. 2: N/A~~	~~$~~	~~$~~
~~UNIT PRICE No. 3: N/A~~	~~$~~	~~$~~

ALLOWANCES

The base bid above includes all allowances specified in the contract documents;

Allowance No.1: “General Owner’s Allowance” $5,000.00

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:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

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

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BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.** This form must be filled out completely with no additions or deletions.

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax payer ID # or Delaware Business license #
1. Laminated Glass			
2. Electrical			
3. Carpentry			

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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 **to the Office of Management and Budget, Division of Facilities Management.**

All the terms and conditions of Project **"SVOP - SECURITY UPGRADES"** Contract Number **MC3806000012** have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIV (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.

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SECTION 01 23 00

ALTERNATES

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 alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

ALTERNATE No. 1: Delete all work associated with window type “W-1” and work shown in detail 3 on sheet A20-1.

Deduct: _____
($)

ALTERNATE No. 2: Delete all work associated with security scope shown in plan 4 on sheet A31-1, including, but not limited to magnetic/electrical locks, wiring, and push buttons.

Deduct: _____
($)

END OF SECTION

SECTION 13 10 10

BULLET RESISTANT EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Bullet Resistant Transaction Window.
B. Countertop communication system:

1.2 RELATED SECTIONS

A. Division 06 Section 06 10 53 “Miscellaneous rough carpentry” for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
B. Division 06 Section 06 40 20 “Interior Architectural Woodwork” for interior woodwork not specified in this Section.
C. Division 09 Section 09 91 00 “Painting": Priming and final field paint finish
D. Division 10 Section 10 26 41 “Bullet Resistant Panels”
E. Division 11 Section 11 19 10 “Hollow Metal (Security & Commercial)”

1.3 REFERENCES

A. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless

C. NIJ Standard 0108.01 - (National Institute of Justice) Standard for Ballistic Resistant Protective Materials.

D. Underwriters Laboratories: UL 752 - Standard for Bullet Resisting Equipment.

1.4 PERFORMANCE REQUIREMENTS

A. Design, fabricate and install all partition materials specified in this section to meet or exceed the requirements of UL 752.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Submit Manufacturer approved shop drawings detailing plan, section and

elevation views as necessary to ensure proper field installation procedures. Coordinate locations with those listed in the Contract Drawings.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits Recommended by manufacturer for optimum results. Do not install products under Environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. At project closeout, provide to Owner or Owners Representative an executed copy of the Manufacturer’s standard limited warranty against manufacturing defect, outlining its terms, Conditions, and exclusions from coverage.

PART 2 PRODUCTS

1. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00

   A. Bullet Resistant Horizontal Slider Transaction Window:

      1. Bullet Resistant Level 2
      2. 1" LP 1000 Laminated
      3. Aluminum sections to be manufactured in accordance with ASTM B209, Extruded aluminum alloy 6063 T5 Anodized or powder coated finish to match the existing décor and be free of sharp edges or burrs when in place. Glazing Channel: U-Channel specifically designed for securing transparencies tightly in place. Angles and stops are only acceptable for top attachment.
      4. The bottom of the glazing to be capped with corresponding material on the frame
      5. Acceptable Manufacturer: (Basis of Design) Total Security Solutions, Inc, 170 National Park Drive, Fowlerville, MI 48836, 800-513-1468. Attn: Sales Department, info@tssbulletproof.com. Web: www.tssbulletproof.com, or approved equal.

   B. Countertop communication system:

      1. Countertop mounted
      2. Vandal resistant.
      3. TTU-3X Counter-top 2-way talk thru - Acceptable Manufacturer: (Basis of Design) Norcon Communications Inc.; 510 Burnside Avenue Inwood, LI, NY 11096 or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

   A. Do not begin installation until substrates have been properly prepared.

   C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

   A. Clean surfaces thoroughly prior to installation.

   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Snap switches and wall-box dimmers.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. TVSS: Transient voltage surge suppressor.

F. UTP: Unshielded twisted pair.

1.4 SHOP DRAWINGS

A. Submit product literature for each device specified.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.6 GENERAL

A. Outlet boxes for all interior, flush mounted wiring devices shall be manufactured of code gauge, galvanized steel construction. Minimum box dimension shall be 4" x 4" x 2 1/8" with "tile rings" provided to suit individual applications. Modify “tile ring” arrangement for equipment that requires specific backbox dimensions and openings.

B. All wiring devices shall be the product of one manufacturer. Standard of design is Hubbell. Pass and Seymour equivalents acceptable. Catalog numbers listed herein are those of Hubbell, Inc.

C. Receptacles for convenience outlets as indicated on the drawings shall be of the duplex, self-aligning type. Contacts shall be wide, heavy, long lasting contact spring type equipped for side and back wiring with 2 binding screws located on the side of the receptacle.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

1. Hubbell
2. Pass & Seymour
3. Or approved equal

B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

B. Receptacles shall be white urea, molded phenolic rated 20 amperes, 125 VAC, 3-wire, grounding type and shall be as manufactured by Hubbell Co. specification grade HBL5362-W.

C. Special receptacles shall be Hubbell or equal grounding type, heavy duty and special configuration receptacles suitable for the loads and current characteristics designated on the drawings. Where

designated, furnish each with a matching cord set of approved length. All special receptacles are designated by NEMA configuration, and shall conform to such standards.

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
4. Color: White

2.5 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Local switches shall be rated 20 amperes, 120 VAC, or 277 VAC as required and shall equal Hubbell Co. Catalog No. 1221-W.

C. Switches, 120/277 V, 20 A White

1. Single Pole, Two Pole, 3 way, 4 way:

D. Pilot-Light Switches, 20 A:
1. Description: Single pole, with neon-lighted handle, illuminated when switch is "off."

E. Barrel Style Key-Operated Switches, 120/277 V, 20 A:
1. Description: Single pole, with factory-supplied key in lieu of switch handle.
2. Key switches shall be barrel key type, Hubbell HBL 1221XRKL. Provide two (2) keys per switch. All locks shall be keyed alike. Provide matching coverplates.

F. Switches in weatherproof locations shall be push-type Hubbell Company Catalog No. 1281/1282, with weatherproof cover plates, Hubbell Company, Catalog No. 1795, as required.

2.6 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Tamper Resistant-“Snake Eyes” Metal with head color to match plate finish.
2. Material for Finished Spaces: White, unbreakable Nylon
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

    a. Cut back and pigtail, or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

B. Identify each receptacle with panelboard identification and circuit number. Use P-Touch type machine printing with Black letters on white field.

C. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
4. Using a test plug, verify that the device and its outlet box are securely mounted.
5. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

D. Wiring device will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION

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SECTION 28 05 00

SECURITY & TELECOMMUNICATIONS RACEWAY

PART 1 - GENERAL

PART 1 - GENERAL PROVISIONS

SCHEDULE 1 - Applicable provisions of the entire specification, including Addenda, shall govern this section as fully as if repeated herein.

SCHEDULE 2 - Refer specifically to the technical provisions of the Division 26 Specifications in their entirety.

PART 2 - SCOPE OF WORK

SCHEDULE 1 - The work under this section of the specification shall include all labor, materials, appliances and services necessary for and incidental to the primary completion of the security and telecommunication raceway system for this structure and related work as shown, implied or required by the drawings and/or described hereinafter.

SCHEDULE 2 - The extent of the security and telecommunication system for this project will be to provide all raceways, backboxes, and access through inaccessible plenums and ancillary components for a complete raceway system.

SCHEDULE 3 - Bids for cabling and hardware (security & telecommunication) may be bid separately.

PART 2 - PRODUCTS

2.1 RACEWAY SYSTEM - SECURITY

A. Backboxes shall be constructed of code gauge galvanized steel. All homeruns shall terminate in area above suspended acoustical ceiling. In areas with no suspended ceiling, extend conduit to nearest accessible ceiling.

B. Door hardware including: position switch, door operator, door strikes, locks and lock power supplies will be furnished by the door manufacturer.. Extend 1" conduit from each device to space as follows:

a. East Wing: Terminate at Secondary Control
b. West Wing; Terminate at Primary Control for Sallyport Doors and Officer’s Station for all other doors.

C. Interconnect door operator with door position switch via 3/4"C. In cases when doors do not have a door operator, omit interconnecting conduit. In areas with no accessible ceiling, provide access panels.

D. Obtain specific requirements of the security system (i.e., backboxes, etc.) with the Security Contractor prior to rough in.

E. Install all security backboxes, junction boxes and conduit.

F. All conduits shall be provided with insulated bushing to protect conductors from damage.

2.2 RACEWAY SYSTEM - TELECOMMUNICATION SYSTEM

A. Backboxes for telecommunication outlets (data or voice) shall be 4-11/16 x 4-11/16" x 2-3/4" with a single gang tile ring at all stations other than type 'A' stations. Type 'A" stations shall receive a 2-gang tile ring. Extend 1" conduit from each outlet and terminate above accessible ceiling with 90° bend and insulating bushing.

B. Provide polyethylene pullropes in all conduits.

C. All conduits shall be provided with insulated bushing to protect conductors from damage.

D. In East Wing, telecommunication services to systems furniture and copier shall be fed from the crawl space below. At source, rise up into Data/Security Closet. At load, rise up into the systems furniture. Coordinate riser locations with Architect. DO NOT scale drawings. Race-ways shall be continuous.

E. In East & West wing, all other Telecommunication outlets shall be fed from overhead.

PART 3 - EXECUTION

3.1 Installation shall be free of defects of workmanship, raceways and outlet boxes shall be void of mortar, construction debris, dirt, water, or other deleterious matter.

3.2 Electrical contractor shall guarantee a raceway system free of defects of material and workmanship. In the event that the Security and telecommunication contractors cannot install wires or devices onto or within the system, the Electrical contractor shall remove all obstructions, to the satisfaction of the Architect and Engineer at no additional expense to the Owner.

3.3 All conduits shall be provided with insulated bushing to protect conductors from damage.

END OF SECTION

SECTION 27 05 26

GROUNDING AND BONDING FOR TELECOMMUNICATION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Grounding conductors.
2. Grounding connectors.
3. Grounding busbars.
4. Grounding rods.
5. Grounding labeling.

1.3 DEFINITIONS

A. BCT: Bonding conductor for telecommunications.

B. EMT: Electrical metallic tubing.

C. TGB: Telecommunications grounding busbar.

D. TMGB: Telecommunications main grounding busbar.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For communications equipment room signal reference grid. Include plans, elevations, sections, details, and attachments to other work.

1.5 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing as-built locations of grounding and bonding infrastructure, including the following:

1. Ground rods.
2. Ground and roof rings.

3. BCT, TMGB, TGBs, and routing of their bonding conductors.

B. Qualification Data: For Installer, installation supervisor, and field inspector.

C. Qualification Data: For testing agency and testing agency's field supervisor.

D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Result of the ground-resistance test, measured at the point of BCT connection.
b. Result of the bonding-resistance test at each TGB and its nearest grounding electrode.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.

1. Installation Supervision: Installation shall be under the direct supervision of ITS Technician, who shall be present at all times when Work of this Section is performed at Project site.
2. Field Inspector: Currently registered by BICSI as ITS Installer 2 to perform the on-site inspection.

PART 2 - PRODUCTS

2.1 SYSTEM COMPONENTS

A. Comply with J-STD-607-A.

2.2 CONDUCTORS

A. Comply with UL 486A-486B.

B. Insulated Conductors: Stranded copper wire, green or green with yellow stripe insulation, insulated for 600 V, and complying with UL 83.

1. Ground wire for ground jumpers shall be No. 6 AWG, 19-strand, UL-listed, Type THHN wire with green outer jacket. Color coding of black conductors will not be permitted.
2. Cable Tray Equipment Grounding Wire: No. 6 AWG.

C. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmils (14.2 sq. mm), 14 strands of No. 17 AWG conductor, and 1/4 inch (6.3 mm) in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Tinned-copper tape, braided conductors terminated with two-hole copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.3 CONNECTORS

A. Irreversible connectors listed for the purpose. Listed by an NRTL as complying with NFPA 70 for specific types, sizes, and combinations of conductors and other items connected. Comply with UL 486A-486B.

B. Compression Wire Connectors: Crimp-and-compress connectors that bond to the conductor when the connector is compressed around the conductor. Comply with UL 467.

1. Electroplated tinned copper, C and H shaped.

C. Signal Reference Grid Connectors: Combination of compression wire connectors, access floor grounding clamps, bronze U-bolt grounding clamps, and copper split-bolt connectors, designed for the purpose.

D. Busbar Connectors: Cast silicon bronze, solderless compression -type, mechanical connector; with a long barrel and two holes spaced on 5/8- or 1-inch (15.8- or 25.4-mm) centers for a two-bolt connection to the busbar.

E. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.4 GROUNDING BUSBARS

A. TGB: Predrilled rectangular bars of hard-drawn solid copper, 1/4 by 2 x 12 inches. The busbar shall be for wall mounting, shall be NRTL listed as complying with UL 467, and shall comply with J-STD-607-A.

1. Predrilling shall be with holes for use with lugs specified in this Section.
2. Mounting Hardware: Stand-off brackets that provide at least a 2-inch clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel.
3. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.

2.5 GROUND RODS

A. Ground Rods: Copper-clad 3/4 inch by 10 feet in diameter.

2.6 LABELING

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the ac grounding electrode system and equipment grounding for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of the electrical system.

B. Inspect the test results of the ac grounding system measured at the point of BCT connection.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with connection of the BCT only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Bonding shall include the ac utility power service entrance, the communications cable entrance, and the grounding electrode system. The bonding of these elements shall form a loop so that each element is connected to at least two others.

B. Comply with NECA 1.

C. Comply with J-STD-607-A.

D. Locate busbars as directed by the Telecommunications Contractor and Engineer of Record.

3.3 APPLICATION

A. Conductors: Install solid conductor for No. 6 AWG and smaller and stranded conductors for AWG and larger unless otherwise indicated.

1. The bonding conductors between the TGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.
2. The bonding conductors between the TMGB and structural steel of steel-frame buildings shall not be smaller than No. 6 AWG.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2 AWG minimum.

C. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

D. Conductor Support:

1. Secure grounding and bonding conductors at intervals of not less than 36 inches.

E. Grounding and Bonding Conductors:

1. Install in the straightest and shortest route between the origination and termination point, and no longer than required. The bend radius shall not be smaller than eight times the diameter of the conductor. No one bend may exceed 90 degrees.
2. Install without splices.
3. Support at not more than 36-inch intervals.
4. Install grounding and bonding conductors in 3/4-inch PVC conduit until conduit enters a telecommunications room. The grounding and bonding conductor pathway through a plenum shall be in EMT. Conductors shall not be installed in EMT unless otherwise indicated.

    a. If a grounding and bonding conductor is installed in ferrous metallic conduit, bond the conductor to the conduit using a grounding bushing that complies with requirements in Section 270528 "Pathways for Communications Systems," and bond both ends of the conduit to a TGB.

3.4 GROUNDING BUSBARS

A. Install busbars horizontally, on insulated spacers 2 inches minimum from wall, 12 inches above finished floor unless otherwise indicated.

B. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

3.5 CONNECTIONS

A. Bond metallic equipment in a telecommunications equipment room to the grounding busbar in that room, using equipment grounding conductors not smaller than No. 6 AWG.

B. Stacking of conductors under a single bolt is not permitted when connecting to busbars.

C. Assemble the wire connector to the conductor, complying with manufacturer's written instructions and as follows:

1. Use crimping tool and the die specific to the connector.
2. Pretwist the conductor.
3. Apply an antioxidant compound to all bolted and compression connections.

D. Primary Protector: Bond to the TMGB with insulated bonding conductor.

E. Interconnections: Interconnect all TGBs with the TMGB with the telecommunications backbone conductor. If more than one TMGB is installed, interconnect TMGBs using the grounding equalizer conductor. The telecommunications backbone conductor and grounding equalizer conductor size shall not be less than 2 kcmils/linear foot of conductor length, up to a maximum size of No. 3/0 AWG unless otherwise indicated.

F. Telecommunications Enclosures and Equipment Racks: Bond metallic components of enclosures to the telecommunications bonding and grounding system. Install top-mounted rack grounding busbar unless the enclosure and rack are manufactured with the busbar. Bond the equipment grounding busbar to the TGB No. 2 AWG bonding conductors.

G. Structural Steel: Where the structural steel of a steel frame building is readily accessible within the room or space, bond each TGB and TMGB to the vertical steel of the building frame.

H. Electrical Power Panelboards: Where an electrical panelboard for telecommunications equipment is located in the same room or space, bond each TGB to the ground bar of the panelboard.

I. Shielded Cable: Bond the shield of shielded cable to the TGB in communications rooms and spaces. Comply with TIA/EIA-568-B.1 and TIA/EIA-568-B.2 when grounding screened, balanced, twisted-pair cables.

J. Rack- and Cabinet-Mounted Equipment: Bond powered equipment chassis to the cabinet or rack grounding bar. Power connection shall comply with NFPA 70; the equipment grounding conductor in the power cord of cord- and plug-connected equipment shall be considered as a supplement to bonding requirements in this Section.

K. Access Floors: Bond all metal parts of access floors to the TGB.

1. Waveguides and Coaxial Cable:

a. Bond cable shields at the point of entry into the building to the TGB and to the cable entrance plate, using No. 2 AWG bonding conductors.
b. Bond coaxial cable surge arrester to the ground or roof ring using bonding conductor size recommended by surge-arrester manufacturer.

3.6 IDENTIFICATION

A. Labels shall be preprinted or computer-printed type.
1. Label TGB(s) with "fs-TGB," where "fs" is the telecommunications space identifier for the space containing the TGB.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:

1. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
2. Test the bonding connections of the system using an ac earth ground-resistance tester, taking two-point bonding measurements in each telecommunications equipment room containing a TMGB and a TGB and using the process recommended by BICSI TDMM. Conduct tests with the facility in operation.

    a. Measure the resistance between the busbar and the nearest available grounding electrode. The maximum acceptable value of this bonding resistance is 100 milliohms.

3. Test for ground loop currents using a digital clamp-on ammeter, with a full-scale of not more than 10 A, displaying current in increments of 0.01 A at an accuracy of plus/minus 2.0 percent.

    a. With the grounding infrastructure completed and the communications system electronics operating, measure the current in every conductor connected to the TMGB and in each TGB. Maximum acceptable ac current level is 1 A.

D. Grounding system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION

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DRAWINGS REDACTED