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Addendum No. 3

Brandywine School District
Wilmington, DE

Bid No.: BSD 18005-GCSERVICES-CARRCROFT

Brandywine School District – Carrcroft Elementary School Addition and Renovation

Tt Project No. 200-15704-17001

Addendum No. 3 to Drawings and Project Manual January 23, 2018

To: ALL BIDDERS

This ADDENDUM forms a part of the BIDDING AND CONTRACT DOCUMENTS and modifies the following documents:
Original DRAWINGS dated December 12, 2017
PROJECT MANUAL dated December 12, 2017.

Acknowledge receipt of the ADDENDUM in the space provided on the FORM OF PROPOSAL

This ADDENDUM consists of three (3) pages not including the attachments:

1.0 PROJECT MANUAL – MODIFICATIONS

- 1.1 Spec Section 07 41 13; Metal Roof Panels
 - 1.1.1 **ADD** Spec Section in its entirety, attached to this Addendum.
- 1.2 Spec Section 08 71 00; Door Hardware
 - 1.2.1 **ADD** Spec Section in its entirety, attached to this Addendum.
- 1.3 Spec Section 09 29 00; Gypsum Board
 - 1.3.1 **ADD** Spec Section in its entirety, attached to this Addendum.
- 1.4 Spec Section 10 28 00; Toilet Accessories
 - 1.4.1 **ADD** Spec Section in its entirety, attached to this Addendum.

1.5 Spec Section 10 44 13; Fire Extinguisher Cabinets

1.5.1 **ADD** Spec Section in its entirety, attached to this Addendum.

1.6 Spec Section 10 44 16; Fire Extinguishers

1.6.1 **ADD** Spec Section in its entirety, attached to this Addendum.

1.7 Spec Section 32 31 13; Chain Link Fences and Gates

1.7.1 **ADD** Spec Section in its entirety, attached to this Addendum.

2.0 DRAWINGS – MODIFICATIONS

2.1 **None at this time.**

3.0 CONTRACTOR QUESTIONS:

3.1 **Question 1:** The following drawings are not listed on the Cover Sheet; EMT-01, FP-1, S-304 and PD-101.

Response: Cover Sheet was revised in Addendum No. 1

3.2 **Question 2:** Drawing E-107 is on the Cover Sheet but not actually included in the drawing file.

Response: There is not a Sheet E-107 in the set, it was erroneously listed on the Cover Sheet. Cover Sheet was revised in Addendum No. 1.

3.3 **Question 3:** Please provide Spec on Gypsum Board Assemblies.

Response: There is not a Sheet E-107 in the set, it was erroneously listed on the Cover Sheet. Cover Sheet was revised in Addendum No. 1.

3.4 **Question 4:** Wall Section show an air infiltration barrier but I do not see any in the specifications. Can you let me know what product they want?

Response: For information regarding the air infiltration barrier please see Spec Section 07 25 00 Weather Barriers that was issued in Addendum No. 2.

3.5 **Question 5:** I see that an Alternate is to add a Generator, are they connecting to the existing Fire Pump? The plans do not indicate that they are. We will need to change the controller if they are Charlie.

Response: The Alternate for the Generator does not add power to the Fire Pump.

3.6 **Question 6:** Please provide a Spec Section for the CFS Trusses required at the existing Roof Over-Build.

Response: Information is included in Spec Section 05 40 00.

3.7 **Question 7:** Drawing C-02 calls for the demolition of an Electrical ductbank. I do not see any Site Electrical work called for to relocate anything electrical. Am I missing something?

Response: See Electrical Sketch E/SK-0.04 issued in Addendum No. 2.

3.8 **Question 8:** Please provide Spec Section for Fiber Cement Siding.

Response: Spec Section 07 46 46 Fiber Cement Siding was issued in Addendum No. 2.

ATTACHMENT LIST

1. Spec Section 07 41 13 Metal Roof Panels
2. Spec Section 08 71 00 Door Hardware
3. Spec Section 09 29 00 Gypsum Board
4. Spec Section 10 28 00 Toilet Accessories
5. Spec Section 10 44 13 Fire Extinguisher Cabinets
6. Spec Section 10 44 16 Fire Extinguisher
7. Spec Section 31 31 13 Chain Link Fences and Gates

END OF ADDENDUM No. 3

SECTION 07 41 13
METAL ROOF PANELS

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. Standing-seam metal roof panels.
 - 2. Metal soffit panels.

1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete weathertight roofing system.

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Design metal roof panel assembly, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at the following test-pressure difference:
 - 1. Test-Pressure Difference: Positive and negative 6.24 lbf/sq. ft.
- D. Water Penetration: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 20 percent of positive design wind pressure, but not less than 6.24 lbf/sq. ft. and not more than 12.0 lbf/sq. ft.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.
- F. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure as indicated on Drawings.
 2. Snow Loads: As indicated on Drawings.
 3. Deflection Limits: Metal roof panel assemblies shall withstand wind and snow loads with vertical deflections no greater than 1/180 of the span.
- G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- H. Solar Reflectance Index: Not less than 29 when calculated according to ASTM E 1980 based on testing identical products by a qualified testing agency.

1.5 SUBMITTALS, GENERAL

- A. General: Submit all action submittals (except Samples for Verification) and informational submittals required by this Section concurrently.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam and endlap joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
- C. Samples for Initial Selection: For each type of metal roof panel indicated with factory-applied color finishes.
1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
1. Metal Roof and Soffit Panels: 12 inches long by actual panel width. Include fasteners, clips, closures, and other metal roof panel accessories.
 2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.

3. Accessories: 12-inch-long Samples for each type of accessory.
- E. Delegated-Design Submittal: For metal roof panel assembly indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 1. Snow Retention System Calculations: Include calculation of number and location of snow guards based on snow load, roof slope, panel length and finish, and seam type and spacing.
- F. Warranties: Samples of special warranties.

1.7 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installers of the items involved:
 1. Roof panels and attachments.
 2. Roof-mounted items including roof penetrations, lighting fixtures, snow guards, and items mounted on roof.
- B. Manufacturer Certificates: Signed by manufacturer certifying that roof panels comply with energy performance requirements specified in "Performance Requirements" Article.
 1. Submit evidence of meeting performance requirements.
- C. Qualification Data: For qualified Installer.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1.8 CLOSEOUT SUBMITTALS

- A. Field quality-control reports.
- B. Maintenance Data: For metal roof panels to include in maintenance manuals.
- C. Warranties: Executed special warranties.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of metal roof panels from single source from single manufacturer.
- C. Fire-Resistance Ratings: Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

D. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, metal roof panel Installer, metal roof panel manufacturer's representative, deck Installer, and installers whose work interfaces with or affects metal roof panels including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities.
3. Review methods and procedures related to metal roof panel installation, including manufacturer's written instructions.
4. Examine deck substrate conditions for compliance with requirements, including flatness and attachment to structural members.
5. Review structural loading limitations of deck during and after roofing.
6. Review flashings, special roof details, roof drainage, roof penetrations, and condition of other construction that will affect metal roof panels.
7. Review temporary protection requirements for metal roof panel assembly during and after installation.
8. Review roof observation and repair procedures after metal roof panel installation.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

1.11 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.12 COORDINATION

- A. Coordinate sizes and locations of equipment supports and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of decks, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.13 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. Weathertight Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Recycled Content of Steel Sheet: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; structural quality.
3. Surface: Smooth, flat finish.
4. Exposed Coil-Coated Finish:
 - a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
5. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.3 mil.

B. Panel Sealants:

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.2 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: 30 to 40 mils thick minimum, consisting of slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
 3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlisle Coatings & Waterproofing Inc., Div. of Carlisle Companies Inc.; CCW WIP 300HT.
 - b. Grace Construction Products; a unit of Grace, W. R. & Co.; Ultra.
 - c. Henry Company; Blueskin PE200 HT.
- B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.
- C. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.3 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide EPDM, PVC, or neoprene sealing washers.
- B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
 - 1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
- B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels, and snapping panels together.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Petersen Aluminum Corporation; Snap-Clad Panels, or comparable product by one of the following:
 - a. IMETCO.
 - b. Metal-Fab Manufacturing, LLC.
 - 2. Material: Aluminum-zinc alloy-coated steel sheet, 0.034-inch nominal thickness.
 - a. Exterior Finish: 2-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
 - 3. Clips: Designed to accommodate thermal movement.
 - a. Material: Minimum 0.050-inch-thick, stainless-steel sheet.
 - 4. Panel Coverage: 18 inches.
 - 5. Panel Height: 1.75 inches.

2.5 METAL SOFFIT PANELS

- A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

- B. Flush-Profile Metal Soffit Panels: Solid panels formed with vertical panel edges and flat pan between panel edges; with flush joint between panels.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Petersen Aluminum Corporation; Flush Panel or comparable product by one of the following:
 - a. IMETCO.
 - b. Metal-Fab Manufacturing, LLC.
 2. Material: Aluminum sheet, 0.032 inch thick.
 - a. Exterior Finish: 2-coat fluoropolymer.
 - b. Color: As selected by Architect from manufacturer's full range.
 3. Panel Coverage: 11 to 13 inches, as standard with manufacturer.
 4. Panel Height: 0.875 to 1.5 inches, as standard with manufacturer.

2.6 ACCESSORIES

- A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Flashing and Trim: Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.
1. Perforated Fascia Closure: Provide ventilated fascia closures in 12 foot lengths with concealed splice plates.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Metal-Era Inc.; Hi-Perf Vented Fascia, or a comparable product.
 - b. Material: Aluminum sheet, 0.063 inch thick.
 - 1) Finish: 2-coat fluoropolymer.
 - 2) Color: As selected by Architect from manufacturer's full range.
 - c. Ventilation: Minimum 51 percent net free area."

2.7 SNOW GUARDS

- A. Snow Guards: Prefabricated, noncorrosive units designed to be installed without penetrating metal roof panels, and complete with predrilled holes, clamps, or hooks for anchoring.
 - 1. Seam-Mounted, Stop-Type Snow Guards: Cast-aluminum stops designed for attachment to vertical ribs of standing-seam metal roof panels with non-penetrating stainless-steel set screws.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Berger Bros. Co.; Real Tool AP400 Snow Guards, or comparable product.
 - b. Color: Custom color matching metal roof panels.

2.8 FABRICATION

- A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile for full length of panel.
- C. Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weathertight and minimize noise from movements within panel assembly.
- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. End Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. End Seams for Other Than Aluminum: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
- B. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.
 - 1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 - 1. Roof perimeter for a distance up from eaves of 36 inches beyond interior wall line.
 - 2. Valleys, from lowest point to highest point, for a distance on each side of 18 inches. Overlap ends of sheets not less than 6 inches.
 - 3. Rake edges for a distance of 18 inches.
 - 4. Ridges for a distance on each side of 12 inches.
 - 5. Roof to wall intersections for a distance from wall of 18 inches.
 - 6. Around penetrating elements for a distance from element of 18 inches.

- B. Felt Underlayment: Apply at locations indicated below, in shingle fashion to shed water, and with lapped joints of not less than 2 inches.
 - 1. Apply on roof not covered by self-adhering sheet underlayment. Lap over edges of self-adhering sheet underlayment not less than 3 inches, in shingle fashion to shed water.
- C. Apply slip sheet over underlayment before installing metal roof panels.
- D. Install flashings to cover underlayment to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."

3.4 METAL ROOF PANEL INSTALLATION, GENERAL

- A. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
- B. Thermal Movement. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
 - 1. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
- C. Install metal roof panels as follows:
 - 1. Commence metal roof panel installation and install minimum of 300 sq. ft. in presence of factory-authorized representative.
 - 2. Field cutting of metal panels by torch is not permitted.
 - 3. Install panels perpendicular to purlins.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Provide metal closures at rake edges, rake walls, and each side of ridge caps.
 - 6. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
 - 7. Install ridge caps as metal roof panel work proceeds.
 - 8. End Splices: Locate panel end splices over, but not attached to, structural supports. Stagger panel end splices to avoid a four-panel splice condition.
 - 9. Install metal flashing to allow moisture to run over and off metal roof panels.
- D. Fasteners:
 - 1. Steel Roof Panels: Use stainless-steel fasteners.
- E. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- F. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

1. Coat back side of roof panels with bituminous coating where roof panels will contact wood, ferrous metal, or cementitious construction.
- G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.
1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

- A. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.
1. Install clips to supports with self-tapping fasteners.
 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.

3.6 METAL SOFFIT PANEL INSTALLATION

- A. In addition to complying with requirements in "Metal Roof Panel Installation, General" Article, install metal soffit panels to comply with requirements in this article.
- B. Metal Soffit Panels: Provide metal soffit panels full width of soffits. Install panels perpendicular to support framing.
1. Flash and seal panels with weather closures where metal soffit panels meet walls and at perimeter of all openings.

3.7 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly including trim, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- C. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.8 SNOW GUARD INSTALLATION

- A. Stop-Type Snow Guards: Attach snow guards to metal roof panels as recommended by manufacturer. Do not use fasteners that will penetrate metal roof panels.

3.9 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.10 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.
- C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SPEC SECTION 08 71 00

DOOR HARDWARE

Manufacturer List

<u>Code</u>	<u>Name</u>
AB	ABH Manufacturing Inc.
BY	By Others
DM	Dorma Door Controls
LC	LCN Closers
NA	National Guard
PR	Precision
SC	Schlage
SDC	Security Door Controls
ST	Stanley
TR	Trimco
VO	Von Duprin

Option List

<u>Code</u>	<u>Description</u>
17	17 LEVER DESIGN
BF	BARRIER FREE OPENING FORCE
CD	CYLINDER DOGGING
B4E	BEVELED 4 EDGES
CSK	COUNTER SINKING
ICX	ICX CONST. CORE
LBR	LESS BOTTOM ROD
10-025	STRIKE-ANSI, 1 3/4" DRS., 1 1/4" X 4 7/8
XQ11-948	Cam for Von Duprin Cyl. Dogging (IC)
1/4-20 SSMS/EA	STAINLESS MACH SCREWS/EXPAN

ANC.

Finish List

<u>Code</u>	<u>Description</u>
AL	Aluminum
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
626W	Weatherized Satin Chrome
GREY	Grey
SP28	Lacquer Sprayed Aluminum

BLACK
US26D
US32DBlack
Chromium Plated, Dull
Stainless Steel, Dull**Hardware Sets****SET #01 - Exterior**

Doors: 007

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device	CD 98EO	US32D	VO
1 Cylinder Core	20-740 as REQ'D	626	SC
1 Mortise Cylinder (Dogging)	20-061 ICX XQ11-948	626	SC
1 Closer	4040 XP SCUSH	AL	LC
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Door Position Switch	MC-4		SDC
1 Gasketing	700 NA @ Head & Jambs		NA
1 Drip Cap	16 A - 4" ODW		NA
1 Door Sweep	200 NA		NA
1 Threshold	896 N 1/4-20 SSMS/EA	AL	NA

NOTE: Coordinate wiring with Related Trades.

SET #02 - Exterior Mech

Doors: 137

2 Continuous Hinge	661HD UL	AL	ST
2 Flush Bolts	3917	626	TR
1 Mortise Lockset	L9080 17 Less OS Trim	US32D	SC
1 Flush Pull	111C	US32D	TR
1 Cylinder Core	20-740 as REQ'D	626	SC
1 Mortise Cylinder	20-061 ICX	626	SC
2 Closers	4040 XP SHCUSH	AL	LC
2 Door Position Switch	MC-4		SDC
1 Gasketing	700 NA @ Head & Jambs		NA
1 Astragal	158NA		NA
1 Drip Cap	16 A - 4" ODW		NA
2 Door Sweep	200 NA		NA
1 Saddle Threshold	425 1/4-20 SSMS/EA	AL	NA

NOTE: Coordinate wiring with Related Trades.

SET #03 - Exterior Pair

Doors: 155A, 155B

2	Continuous Hinge	661HD UL	AL	ST
1	Mullion	KR4954	SP28	VO
1	Exit Device	CD 98EO	US32D	VO
1	Exit Device	CD 98L-NL x 996L-NL-R&V 17	US32D	VO
4	Cylinder Core	20-740 as REQ'D	626	SC
1	Rim Cylinder (Trim)	20-057 ICX	626	SC
1	Mortise Cylinder	20-061 ICX	626	SC
2	Mortise Cylinder (Dogging)	20-061 ICX XQ11-948	626	SC
2	Closer	4040 XP SCUSH	AL	LC
2	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
2	Door Position Switch	MC-4		SDC
1	Gasketing	700 NA @ Head & Jambs		NA
1	Mullion Seal	5100N-86 86"		NA
1	Astragal Set	140 PA SET		NA
2	Door Sweep	200 NA		NA
1	Threshold	896 N 1/4-20 SSMS/EA	AL	NA

NOTE: Coordinate wiring with Related Trades.

SET #04 - Exterior Pair

Doors: 164

2	Continuous Hinge	661HD UL	AL	ST
1	Mullion	KR4954	SP28	VO
1	Exit Device	CD 98L x 996L-R&V 17	US32D	VO
1	Exit Device	CD 98L-DT x 996L-DT 17	US32DS32D	VO
4	Cylinder Core	20-740 as REQ'D	626	SC
1	Rim Cylinder (Trim)	20-057 ICX	626	SC
1	Mortise Cylinder	20-061 ICX	626	SC
2	Mortise Cylinder (Dogging)	20-061 ICX XQ11-948	626	SC
2	Closer	4040 XP SCUSH	AL	LC
2	Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
2	Door Position Switch	MC-4		SDC
1	Gasketing	700 NA @ Head & Jambs		NA
1	Mullion Seal	5100N-86 86"		NA
1	Astragal Set	140 PA SET		NA
2	Door Sweep	200 NA		NA
1	Threshold	896 N 1/4-20 SSMS/EA	AL	NA

NOTE: Coordinate wiring with Related Trades.

SET #05 - Vestibule

Doors: 128

3 Hinges	CB179 4 ½ x 4 ½ NRP	626	ST
1 Lockset	ND80TD SPA 10-025	626	SC
1 Cylinder Core	20-740 as REQ'D	626	SC
1 Electric Strike	6100 series DMS EB	630	VO
1 Closer	4040 XP	AL	LC
1 Wall Bumper	1270WV	630	TR
1 Mop Plate	KM050 4" x 1" LDW B4E CSK	630	TR
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Power Supply	As REQ'D		VD
1 Door Position Switch	MC-4		SDC
1 Gasketing	2525 @ Head & Jambs		NA
1 Door Sweep	200 NA		NA
1 Wall Phone	BY OTHERS		BY

NOTE: Operation: Door normally closed and locked. Assess via the A- phone to call and request entry or mechanical key at Exit Device Push button (By others) located at reception desk releases electric strike allowing entry. Egress always allowed. Exit device may be dogged via keyed cylinder for push/pull operation. Coordinate wiring with Related Trades.

SET #06 - Classroom / Office / Conf

Doors: 118, 119, 126, 127

3 Hinges	CB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Classroom Sec Lockset	ND75TD SPA 10-025	626	SC
2 Cylinder Core	20-740 as REQ'D	626	SC
1 Wall Bumper	1270WV	630	TR
3 Door Silencers	1229A	GREY	TR

SET #07

Doors: 128A

3 Hinges	CB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Classroom Sec Lockset	ND75TD SPA 10-025	626	SC
2 Cylinder Core	20-740 as REQ'D	626	SC
1 Closer	4040 XP EDA	AL	LC
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
1 Mop Plate	KM050 4" x 1" LDW B4E CSK	630	TR
1 Wall Bumper	1270WV	630	TR
3 Door Silencers	1229A	GREY	TR

SET #08 - Office

Doors: 122, 123, 124, 125, 129,130, 131, 132, 133, 135

3 Hinges	CB179 4 1/2 X 4 1/2	US26D	ST
1 Classroom Lockset	ND70TD SPA 10-025	626	SC
1 Wall Bumper	1270WV	630	TR
3 Door Silencers	1229A	GREY	TR

SET #09 - Closet

Doors: 127A

3 Hinges	CB179 4 1/2 X 4 1/2	US26D	ST
1 Storeroom Lockset	ND80TD SPA 10-025	626	SC
1 Cylinder Core	20-740 as REQ'D	626	SC
1 Wall Bumper	1270WV	630	TR
3 Door Silencers	1229A	GREY	TR

SET #10 - Closet

Doors: 121A

6 Hinges	CB179 4 1/2 X 4 1/2 NRP	US26D	ST
2 Flush Bolt	3917	626	TR
1 Deadlock (Classroom)	L463T	626	SC
1 Cylinder Core	20-740 as REQ'D	626	SC
2 Edge Pull	1062	626	TR
2 Wall Bumper	1270WV	630	TR
1 Dustproof Strike	3910	626	TR
2 Door Silencers	1229A	GREY	TR

SET #11 - Closet

Doors: 134

6 Hinges	CB179 4 1/2 X 4 1/2 NRP	US26D	ST
2 Flush Bolt	3917	626	TR
1 Deadlock (Classroom)	L463T	626	SC
1 Cylinder Core	20-740 as REQ'D	626	SC
2 Edge Pull	1062	626	TR
2 Overhead Stop	4420 Series	US32D	AB
1 Dustproof Strike	3910	626	TR
2 Door Silencers	1229A	GREY	TR

SET #12 - Lav

Doors: 136, 154A, 154B

3 Hinges	CB179 4 1/2 X 4 1/2	US26D	ST
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1 Privacy Set	ND40S SPA 10-025	626	SC
1 Wall Bumper	1270WV	630	TR
3 Door Silencers	1229A	GREY	TR

SET #13

Doors: 153, 154

6 Hinges	CB168 5 X 4 1/2	US26D	ST
1 Fire Exit Device	9827EO-F LBR	US32D	VO
1 Fire Exit Device	9827L-BE-F x 996L-R&V-BE 17 LBR	US32D	VO
2 Magnetic Holder	EM 504	689	DM
2 Closer	4040 XP EDA	AL	LC
2 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
2 Mop Plate	KM050 4" x 1" LDW B4E CSK	630	TR
1 Gasketing	5050C Head & Jambs		NA
1 Astragal Set	115 NA SET		NA

NOTE: Coordinate wiring with Related Trades.

SET #14 - Cafe

Doors: 155

6 Hinges	CB179 4 1/2 X 4 1/2	US26D	ST
1 Set Auto Flush Bolts	3815L X 3815L	626	TR
1 Classroom Sec Lockset	ND75TD SPA 10-025	626	SC
2 Cylinder Core	20-740 as REQ'D	626	SC
2 Magnetic Holder	EM 504	689	DM
1 Coordinator	3094	BLACK	TR
2 Closer	4040 XP REG	AL	LC
2 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
2 Mop Plate	KM050 4" x 1" LDW B4E CSK	630	TR
1 Dustproof Strike	3910	626	TR
1 Gasketing	5050C Head & Jambs		NA

NOTE: Coordinate wiring with Related Trades.

SET #15 - Kitchen

Doors: 156, 156A

3 Hinges	CB179 4 1/2 X 4 1/2 NRP	US26D	ST
1 Deadlock	L460T	626	SC
1 Cylinder Core	20-740 as REQ'D	626	SC
1 Pull Plate	1017-3B	630	TR
1 Push Plate	1001-9	630	TR
1 Closer	4040 XP EDA	AL	LC
1 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR

1 Mop Plate	KM050 4" x 1" LDW B4E CSK	630	TR
1 Wall Bumper	1270WV	630	TR
3 Door Silencers	1229A	GREY	TR

SET #16 – Lobby Pair

Doors: 152

2 Continuous Hinges	661HD UL	628	ST
1 Mullion	KR4954	SP68	VO
1 Exit Device	CD 98L x 996L-R&V 17	US32D	VO
1 Exit Device	CD 98L-DT x 996L-DT 17	US32D	VO
4 Cylinder Cores	20-740 as REQ'D	626	SC
1 Rim Cylinder (Trim)	20-057 ICX	626	SC
1 Mortise Cylinder	20-061 ICX	626	SC
2 Mortise Cylinders (Dogging)	20-061 ICX	626	SC
2 Closers	4040 XP SCUSH	AL	LC
2 Kick Plate	K0050 10" x 2" LDW B4E CSK	630	TR
2 Door Position Switches	MC-4		SDC

1 Gasketing	700NA@ Heads & Jambs	NA
1 Mullion Seal	5100N-86 86"	NA

NOTE: Coordinate wiring with related Trades.

SET #17 - Exterior Gate

Doors: 008

1 Exit Device	2101	626W	PR
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NOTE: Balance of hardware by gate manufacture. Coordinate Exit Device mounting with gate manufacture.

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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. Interior gypsum board.
 - 2. Tile backing panels.

1.3 SUBMITTALS, GENERAL

- A. General: Submit all submittals required by this Section concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 20 percent.
- B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- C. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. CertainTeed Corp.
 - 2. National Gypsum Company.
 - 3. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
- C. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 1.
 - 1. Core: 5/8 inch, Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10.

2.4 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Custom Building Products; Wonderboard.
 - b. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
 - c. USG Corporation; DUROCK Cement Board.
2. Thickness: 1/2 inch.
3. Mold Resistance: ASTM D 3273, score of 10.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. Expansion (control) joint.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
1. Laminating adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
 2. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 20 percent.
- E. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Grabber Construction Products; Acoustical Sealant GSC.
 - b. Pecora Corporation; AC-20 FTR.
 - c. USG Corporation; SHEETROCK Acoustical Sealant.
 2. Acoustical joint sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- F. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PRE-ENCLOSURE REVIEW

- A. Notify Architect prior to applying panels to allow observation of framing installation, including supplementary framing and blocking.

3.3 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both

faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.4 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:

- 1. Type X: All surfaces unless otherwise indicated.
- 2. Abuse-Resistant Type: As indicated on Drawings.

- B. Single-Layer Application:

- 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
- 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
- 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

- C. Multilayer Application:

- 1. On ceilings, apply gypsum board indicated for base layers before applying face layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
- 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
- 3. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.5 APPLYING TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.
- B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.6 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. L-Bead: Use where indicated.

3.7 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 5: At panel surfaces that will be exposed to view unless otherwise indicated.
- E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 10 28 00
TOILET ACCESSORIES

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. Toilet accessories.
 - 2. Under-lavatory guards.
 - 3. Electric hand dryers.

1.3 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation. Include electrical characteristics.
 - 1. Grab bars.
 - 2. Fixed mirror, glass.
 - 3. Waste receptacle.
 - 4. Sanitary-napkin disposer.
 - 5. Electric Hand Dryer.
 - 6. Lav-Shield
- B. Samples: Full size, for each exposed product and for each finish specified.
 - 1. Approved full-size Samples will be returned and may be used in the Work.

- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.
 - 2. Identify accessories using designations indicated.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, visible silver spoilage defects.
 - 2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

- A. Owner-Furnished Materials:
 - 1. Toilet paper dispenser.
 - 2. Paper towel dispenser.
 - 3. Soap dispenser.
 - 4. Coat Hook

2.2 PERFORMANCE REQUIREMENTS

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

2.3 TOILET ACCESSORIES

- A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.
- B. Grab Bars: TA-03, TA-04 and TA-05.

- 1. Products: As indicated on drawings.
- C. Fixed Mirror, Glass: TA-07.
 - 1. Products: As indicated on drawings.
- D. Waste Receptacle, TA-08.
 - 1. Products: As indicated on drawings.
- E. Sanitary Napkin Disposer: TA-09.
 - 1. Products: As indicated on drawings.
- F. Electric Hand Dryer: TA-10.
 - 1. Products: As indicated on drawings.
 - 2. Mounting: Surface mounted.
 - 3. Operation: Electronic-sensor activated.
 - 4. Cover Material and Finish: Brushed Stainless Steel.
 - 5. Electrical Requirements: See electrical drawings.
- G. Lav-Shield: TA-11.
 - 1. Products: As indicated on drawings.

2.4 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.5 FABRICATION

- A. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of accessories.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.3 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION

SECTION 10 44 13
FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fire protection cabinets for the following:
 - a. Portable fire extinguishers.

1.3 SUBMITTALS, GENERAL

- A. General: Submit all action submittals required by this Section and by Division 10 Section "Fire Extinguishers" concurrently.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets. Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
 - 1. Non-rated fire protection cabinets.
- B. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fire protection cabinets to include in maintenance manuals.

1.6 PERFORMANCE REQUIREMENTS

- A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.
- B. Preinstallation Conference: Conduct conference at Project site.

1.7 COORDINATION

- A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Stainless-Steel Sheet: ASTM A 666, Type 304.
- C. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 NON-RATED FIRE PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Fire End & Croker Corporation; Series 1620 or comparable product by one of the following:
 - a. J. L. Industries, Inc., a division of Activar Construction Products Group.
 - b. Larsen's Manufacturing Company.
 - c. Potter Roemer LLC.
- B. Cabinet Construction: Nonrated.
- C. Cabinet Material: Steel sheet.
- D. Recessed Cabinet: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.
 - 1. Exposed Flat Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
- E. Cabinet Trim Material: Steel sheet.

- F. Door Material: Steel sheet.
- G. Door Style: Fully glazed panel with frame.
- H. Door Glazing: Tempered float glass (clear).
- I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide projecting door pull and friction latch.
 - 2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.
- J. Accessories:
 - 1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
 - a. Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER." Lettering color and orientation as directed by Architect.
- K. Finishes:
 - 1. Steel: Baked enamel or powder coat.
 - a. Exterior Color: Red.
 - b. Interior Color: White.

2.3 FABRICATION

- A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 - 1. Weld joints and grind smooth.
 - 2. Provide factory-drilled mounting holes.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
 - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
 - 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.

2.5 STEEL FINISHES

- A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling". After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
- B. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Prepare recesses for recessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
 - 1. Fire Protection Cabinets: 40 inches above finished floor to top of cabinet rough opening
- B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire protection cabinet doors to operate easily without binding.
- C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet manufacturers.
- E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

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SECTION 10 44 16
FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Dry-chemical type (ABC)
 - 2. Mounting brackets.
 - 3. Identification.
- B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
 - a. Amerex Corporation.
 - b. Ansul Incorporated; Tyco International Ltd.
 - c. Badger Fire Protection; a Kidde company.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - g. Larsen's Manufacturing Company.
 - h. Potter Roemer LLC.
 - i. Pyro-Chem; Tyco Safety Products.

Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

- B. Multipurpose Dry-Chemical Type in Steel Container (ABC): UL-rated 4-A: 80-B:C, **10-lb** nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.
 - 1. Basis-of-Design Product: Fire End & Croker Corporation; Figure No. 4010.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

3.2 INSTALLATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
 - 1. Mounting Brackets: 40 inches above finished floor to top of fire extinguisher.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

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SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Galvanized steel chain link fence and gates.
 - 2. Galvanized steel framework.
 - 3. Permafused II, polyolefin.
 - 4. Privacy Slats
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 2 Section 31 20 00 - Earthmoving
 - 2. Division 3 Section 03 30 00 – Cast-In-Place Concrete

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data in the form of manufacturer's technical data, specifications, and installation instructions for fence and gate posts, fabric, gates, and accessories.
- C. Shop drawings showing location of fence, gates, each post, and details of post installation, extension arms, gate swing, hardware, and accessories.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain chain link fences and gates as complete units, including necessary erection accessories, fittings, and fastenings from a single source or manufacturer. All galvanized surfaces damaged by field welding shall be field repaired with three coats of zinc rich paint.

1.5 STANDARDS

- A. The following publications form part of this Section of the Specifications to the extent indicated by reference thereto:
 - 1. Chain Link Fence Manufacturers Institute (CLFMI)

- a. CLFMI - Voluntary standard for chain link fence installation.
- 2. American Society for Testing Materials (ASTM)
 - a. ASTM A090 - Testing for weight of coating on zinc-coated (Galvanized).
 - b. ASTM A120 - Pipe, steel, black and hot-dipped zinc-coated (Galvanized) welded and seamless for ordinary uses.
 - c. . ASTM A123 - (Hot Galvanized) Coatings on products fabricated from rolled, pressed and forged steel shapes, bars and strip.
 - d. ASTM A153 - Specification for zinc coating (Hot-Dip) on iron and steel hardware.
 - e. ASTM A392 - Zinc coated steel chain link fence fabric.
 - f. ASTM A446 - Specification for steel, zinc-coated (Galvanized) by the hot-dip process, structural (Physical) quality.
 - g. ASTM A525 - Specification for steel, zinc-coated (Galvanized) by the hot-dip process, general requirements.
 - h. ASTM A570 - Hot rolled sheet and strip, structural quality.
 - 1) ASTM F626 - Specification for fence fittings.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for fences and gates shown on the Drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCT

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. PVC Coated Galvanized Steel Fencing and Fabric:
 - a. Master Halco
 - b. Merchants Metals
 - c. Ameristar Fence Products
- B. Salvage: Shall be knuckled at top and bottom of fabric.
- C. Steel Fabric: Comply with Chain Link Fence Manufacturers Institute (CLFMI) Product Manual. Furnish one-piece fabric widths for fencing up to 6 feet high. Wire size includes zinc coating.
 - 1. Steelwire fabric: Permafused II, color green.
 - 2. Size: 2 inch mesh, 9-gage (0.148-inch diameter) core.
 - 3. Coating ASTM F668, class 2b over metallic-coated steel wire.
 - 4. Polymer coating; color green complying with ASTM F934.

2.2 FRAMING

- A. Strength requirements for posts and rails conforming to ASTM F 669.
- B. Pipe shall be straight, true to section, material, and sizes specified, and shall conform to the following weights per foot; according to heavy industrial requirements ASTM F669, Group 1A, with minimum yield strength of 25,000 psi, Type A coating inside and out ASTM F1234 as determined by ASTM A90.

<u>NPS in inches</u>	<u>Outside Diameter (OD) in inches</u>	<u>Type I Steel, lb/ft</u>	<u>Type II Steel, lb/ft.</u>
1	1.315	1.68	1.35
1-1/4	1.660	2.27	1.84
1-1/2	1.900	2.72	2.28
2	2.375	3.65	3.12
2-1/2	2.875	5.79	4.64
3	3.500	7.58	5.71
3-1/2	4.000	9.11	6.56
4	4.500	10.79	CC
6	6.625	18.97	CC
8	8.625	28.55	CC

C. Steel Framework, General: Top and rails.

- 1. Type I Pipe: Round Hot-dipped galvanized steel pipe conforming to ASTM F 1083, standard weight (schedule 40) (vinyl coated).
- 2. 2.875-inch O.D., intermediate posts Type I galvanized steel (schedule 40) 5.79 lbs per lin. ft. vinyl coated.
- 3. Top Rail, Center Rail and Bottom Rail: 1.66" O.D., Type I galvanized steel 2.27 lbs. per lin. ft. (schedule 40) vinyl coated.

2.3 GATE POST, END POSTS, CORNER POSTS, VINYL COATED

- A. 4" O.D., Type I galvanized steel 10.79 lbs. per lin. ft. for gates (Schedule 40).
- B. Gate Frame: 1.9 O.D., Type I galvanized steel 2.72 lbs per lin. ft. for side to top and bottom. Center rail 1.66" O.D. galvanized steel 2.27 lbs per lin. ft.

2.4 VINYL COATINGS

- A. Plastic applied by fusion over a thermoset plastic bonding agent.
 - 1. Thickness: 10-14 mils minimum.
 - 2. Color: To match fence fabric.

2.5 FITTINGS AND ACCESSORIES

- A. Material: Comply with ASTM F 626. Galvanized steel, to suit manufacturer's standards. All material to have thermally fused PVC finish.
 - 1. Zinc Coating: Unless specified otherwise, galvanize steel fence fittings and accessories in accordance with ASTM A 153, with zinc weights per Table I.
- B. Tension Wire: 6 gage metallic-coated steel marcelled tension wire conforming to ASTM A 824 with finish to match fabric.
 - 1. Type II Zinc Coated in following class:
 - a. Class 2, with a minimum coating weight of 2 oz. per sq. ft. of uncoated wire surface.
- C. Tie Wires: PVC coated 9-gage (0.106-inch diameter) galvanized steel with a minimum of 2 oz. per sq. ft. of zinc coating of surface area in accordance with ASTM A 641, Class 3 to match fabric core material.
- D. Post Brace Assembly: Manufacturer's standard adjustable brace at end and gate posts and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric. Use same material as top rail for brace, and truss to line posts with 3/8-inch- diameter rod and adjustable tightener. Provide manufacturer's standard PVC coated galvanized steel cap for each end.
- E. Post and Line Caps: Provide weathertight closure cap for each post. Provide line post caps with loop to receive tension wire or top rail. PVC coated.
- F. Tension or Stretcher Bars: Hot-dip galvanized steel PVC coated with minimum length 2 inches less than full height of fabric, cross-section of 1/4 inch by 3/4 inch and minimum 2 oz. zinc coating per sq. ft. of surface area. Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into post.
- G. Tension and Brace Bands: 1-inch-wide Brace Bands PVC coated 9-gage minimum hot-dip galvanized steel with minimum 2 oz. zinc coating per sq. ft. of surface area.
 - 1. Tension Bands: 11 gage thick, 3/4 inch wide minimum.
- H. Concrete: Mix materials to obtain concrete with a minimum 28-day compressive strength of 3000 psi.

2.4 GATES

- A. Fabrication: Fabricate perimeter frames of gates from metal and finish to match fence framework. Assemble gate frames by welding. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. See drawings for gate size of single width 5' and double 10'.
 - 1. Provide same fabric as for fence unless otherwise indicated. Install fabric with tension bars and bands at vertical edges and at top and bottom edges.
 - 2. Install diagonal cross-bracing consisting of 3/8-inch-diameter adjustable-length truss rods on gates to ensure frame rigidity without sag or twist.
 - 3. To 6 feet High: Fabricate perimeter frames of minimum 1.90-inch OD Type I or II steel pipe.

4. Gate Hardware: Provide hardware and accessories for each gate, PVC coated galvanized per ASTM A 153, and in accordance with the following:
 - a. Hinges: Size and material to suit gate size, non-lift-off type, offset to permit 180-deg gate opening. Provide 1-1/2 pair of hinges for each leaf over 6-foot nominal height.
 - b. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as integral part of latch.
 - c. Keeper: Provide keeper for vehicle gates, which automatically engages gate leaf and holds it in open position until manually released.
 - d. Gate Stops: Provide gate stops for double gates, consisting of mushroom-type flush plate with anchors, set in concrete, and designed to engage center drop rod or plunger bar. Include locking device and padlock eyes as integral part of latch, permitting each gate to be locked separately with a padlock.

2.5 PRIVACY SLATS

- A. Material: Polyethylene tubular slats, not less than 0.023 inch (0.58 mm) thick, manufactured for chain-link fences from virgin polyethylene containing UV inhibitor, sized to fit mesh specified for direction indicated; with vandal-resistant fasteners and lock strips.
 1. Color: to match fence fabric.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install fence in compliance with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.
 1. Excavation: Drill or hand-excavate (using post-hole digger) holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
 2. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.
- B. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space as indicated on drawings.
 1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
 2. Where indicated on drawing, extend concrete footings 1/2 inch above grade and trowel to a crown to shed water.
- C. Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.

- D. Center Rails and Bottom Rails: Provide center rails where indicated. Install in one piece between posts and flush with post on fabric side, using rail ends and special offset fittings where necessary.
- E. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.
- F. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric before stretching fabric and tie to each post with not less than same gage and type of wire. Pull wire taut, without sags. Fasten fabric to tension wire with 11-gage hog rings of same material and finish as fabric wire, spaced maximum 24 inches o.c.
- G. Fabric: Leave approximately 1 inch between finish grade and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.
- H. Tension or Stretcher Bars: Thread through or clamp to fabric 4 inches o.c., and secure to end, corner, pull, and gate posts with tension bands spaced not over 15 inches o.c.
- I. Tie Wires: Use U-shaped wire of proper length to secure fabric firmly to posts and rails with ends twisted at least 3 full turns. Bend ends of wire to minimize hazard to persons or clothing.
- 1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to rails and braces 24 inches o.c.
- J. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
- K. Gates: Install gates plumb, level, and secure for full opening without interference. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.2 CLEANING

- A. Remove from the project site any excess material and equipment at the completion of the work of this section.

END OF SECTION