

Addendum No. 1
August 27, 2020

Project: Beresford School Bus Garage
Beresford, South Dakota

Architecture Incorporated Project No.: 2886

Architect: Architecture Incorporated

Letting: **2:00 p.m. (prevailing time)**
Thursday, September 10, 2020
Beresford School District Administration Office
301 West Maple Street
Beresford, South Dakota, 57004

Scope of this Addendum:

To all bidders and all others to whom drawings and specifications have been issued by Architecture Incorporated, this Addendum forms a part of the Contract Documents. Acknowledge receipt of this addendum by listing its number and date in the bidder's Form of Proposal. Failure to do so may subject bidder to disqualification. This addendum modifies the drawings and specifications as follows:

GENERAL ITEMS:

1) GENERAL ITEMS:

- a) Provide two pipe bollards adjacent to Gas Meter at north side of building, near east end. Reference architectural detail 1/4.10 and mechanical drawing Sheet 8.21.

2) CONTRACTOR OPTION:

- a) The Contractor shall have the option of constructing the trench drain assemblies as detailed on the Drawings – **OR** – may utilize a prefabricated trench drain system.
 - i) Pre-fabricated trench drain systems shall meet or exceed all requirements specified, including load requirements.
 - ii) Pre-fabricated trench drain systems shall be based on DURA TRENCH's *10" Wide Precast Trench Drain System (model # DTPF10-HDBP15ZSA)* with *Factory-Finished Ductile Iron Frame and 12" WIDE Slotted Grates (model #12B24DI)*.

3) SECTION 033000 – CAST-IN-PLACE CONCRETE

- a) Replace Article 2.8.A.1. with the following:
 - 1. ***Product: Lithium silicate concrete floor densifier shall be based on [LION HARD] by L & M Construction Chemicals.***

b) Replace Article 2.9.A. with the following:

A. Liquid Floor Sealer: Clear, non-yellowing waterborne concrete sealer specifically designed to seal and protect interior concrete surfaces. Apply to typical interior concrete slabs at locations noted as sealed concrete.

4) SECTION 055000 – METAL FABRICATIONS

a) CLARIFICATION: The cast iron manhole and cast iron grate (drain) at the oil interceptor pit should be provided by Section 055000.

b) Furnish and install a manhole seal that is compatible with the oil interceptor manhole.

i) Seal: 1/8-inch stainless-steel manhole cover seal with heavy-duty lifting handles and gaskets to prevent migration of petroleum gases and vapors to the atmosphere.

(1) Based on NsertAseal Corporation's – Access Hole Seal; water seal [not] required.

5) SECTION 055100 – METAL STAIRS

a) By receipt of this addendum all Bidders shall acknowledge the addition of **Section 055100 – METAL STAIRS** (dated August 27, 2020).

i) This technical Section is attached to the end of this addendum and shall hereby become a part of the contract documents; 6 pages total.

6) SECTION 055113 – METAL PAN STAIRS

a) Omit Section 055113 in its entirety; there are no metal pan stairs required as a part of this Project. Reference Section 055100 for metal stair (with steel grate treads) requirements.

7) SECTION 055300 – GRATINGS

a) By receipt of this addendum all Bidders shall acknowledge the addition of **Section 055300 – GRATINGS** (dated August 27, 2020).

i) This technical Section is attached to the end of this addendum and shall hereby become a part of the contract documents; 5 pages total.

8) SECTION 093000 – TILING

a) Section 093000 which was originally included in the Project Manual shall be replaced in its entirety with (new) technical Section 093000 attached to the end of this addendum (dated August 27, 2020).

i) This (new) technical Section is attached to the end of this addendum and shall hereby become a part of the contract documents; 11 pages total.

- 9) SECTION 123661 – SIMULATED STONE COUNTERTOPS
- a) By receipt of this addendum all Bidders shall acknowledge the addition of **Section 123661 – SIMULATED STONE COUNTERTOPS** (dated August 27, 2020).
 - i) This (new) technical Section is attached to the end of this addendum and shall hereby become a part of the contract documents; 2 pages total.
- 10) SHEET 3.20 – FOUNDATION PLAN
- a) Provide a structural ceiling above room “Oil Storage 107” in accordance with the applicable architectural drawings.
 - i) Provide construction similar to details shown for “Mezzanine Plan” on Sheet 3.30, except provide 600S162-54 joists in lieu of 1200S200-97 joists.
 - ii) Span the joists in the east-west direction.
- 11) SHEET 4.10 – FIRST FLOOR PLAN
- a) ROOM FINISH SCHEDULE:
 - i) MENS 102: Provide **T (tile)** Floor finish in lieu of ~~SCONC~~; provide **T (tile)** base in lieu of ~~RB~~; provide **T (4'-0" high tile wainscot on plumbing wall)** in addition to **PNT** Wall Finish.
 - ii) WOMENS 104: Provide **T (tile)** Floor finish in lieu of ~~SCONC~~; provide **T (tile)** base in lieu of ~~RB~~; provide **T (4'-0" high tile wainscot on plumbing wall)** in addition to **PNT** Wall Finish.
 - iii) JANITOR 103: Provide **5/8" Gypsum board ceiling** at bottom of c-joint mezzanine framing in lieu of ~~ACT~~.
 - iv) ROOM FINISH NOTES: Change ceramic tile wainscot height from ~~5'-0"~~ to **4'-0"**.
 - b) OIL STORAGE 107: Provide 6" c-joints with 9/16" X 22 ga. deck and 1/2" plywood sheathing per structural. T.O. MASONRY at north and west walls = 10'-0".
- 12) SHEET 4.11 – MEZZANINE FLOOR PLAN
- a) Toilet / Bath Accessory Schedule: Item F: **Not Used**
 - b) Enlarged Toilet Room Plan: Omit callout for toilet accessory ‘**F**’ (not used).
- 13) SHEET 4.30 – DOOR SCHEDULE
- a) Door #104 & #108 – Omit ‘**CARD READER & ELECTRIC STRIKE**’ from Additional Notes column.
 - b) Door #105 & #109-2 – Add ‘**CARD READER & ELECTRIC STRIKE**’ to Additional Notes column.
 - c) Door #105 – change head detail to 14/4.30 and jamb detail to 15/4.30.

14) SHEET 5.20 – BUILDING SECTIONS

- a) Elevation E/5.20 - Modify guardrail not to omit ~~VERTICALS AT 48" O.C. MAX.~~ See structural detail 8/3.30 for guardrail pipe size, spacing and attachment to masonry wall.
- b) Detail 8/5.20 – See structural detail 8/3.30 for guardrail pipe size, spacing and attachment to masonry wall. Extend guardrail vertical posts down onto masonry for attachment to masonry per structural detail 8/3.30.

15) SHEET 5.41 – ENLARGED SECTION DETAILS

- a) Waste Oil Pit Detail 10/5.41 – pit size is 4’-0” x 4’-0” square/clear.

MECHANICAL ITEMS:

1) SECTION 220100 – GENERAL PROVISIONS

- a) Add the following to Article 1.28 “Pipe and Pipe Fittings”:

Fuel oil piping inside buildings above ground shall be standard weight black mild steel pipe, ASTM A120/ ASTM A53 and Federal Specification WW P 406. Fittings for exposed piping up to and including 2 inch size shall be standard weight black malleable iron screwed fittings. Fittings 2 1/2 inch size and larger and in all concealed locations shall be welding type. There shall be no unions installed in concealed locations. A manual shut off valve and union shall be installed at each item of mechanical equipment with a fuel oil connection. For standardized lettering and abbreviations, use OIL for fuel oil piping.

2) SECTION 220400 – PLUMBING

- a) Add the following to Section 220400:

POINT-OF-USE MIXING VALVE:

Furnish and install a Lawler Model TMM-1070 or equal thermostatic mixing valve where shown on the Drawings.

The valve shall be a mechanical mixing valve with a high temperature limit stop with automatic reset. The mixing valve shall have compression fittings and a means to adjust outlet temperature. The mixing valve shall be able to handle hot water supply temperatures up to 140 degrees F and water supply static pressures up to 125 psi.

Water mixing valve for tempered water control shall have bronze body construction with non-corrosive parts. Valve shall include integral back flow checks.

Temperature adjustment control shall be tamper-resistant.

The valve shall be designed such that the delivery temperature can range from full cold up to 115 degrees F. The valve shall not be able to be adjusted above its shut-off temperature of 120 degrees F. The mixing valve shall automatically shut down flow of water when the temperature reaches 120 degrees F.

Valve capacity shall be at least 1 gpm at a pressure differential of 10 psi and at least 2 gpm at a pressure differential of 45 psi. Valve shall comply with ASSE 1070.

Valves shall be MCC Powers, Lawler, Symmons, Leonard or equal.

3) SECTION 220700 – INSULATION AND PIPING IDENTIFICATION

a) Modify Article 1.03 “Piping and Vessels Insulation” as described below:

i) The statement *Piping 10 ft or greater above the floor need not have PVC covering* shall be omitted and replaced with the following:

Piping 10 ft or greater above the floor need not have PVC covering, except for in ‘Wash Bay 109’. All piping in the wash bay requires PVC covering.

b) Add the following to Article 1.04 “Piping and Vessels Insulation”:

Piping 10 ft or greater above the floor need not have PVC covering, except for in ‘Wash Bay 109’. All piping in the wash bay requires PVC covering.

4) SECTION 230800 – VENTILATION AND AIR CONDITIONING

a) Add the following to Section 230800:

FABRIC DUCT SYSTEM:

Furnish and install a fabric duct distribution system as shown on the Drawings.

Product must be Classified by Underwriter’s Laboratories in accordance with the 25/50 flame spread / smoke developed requirements of NFPA 90-A and are also classified in accordance with ICC Evaluation Service AC167.

All product sections must be labeled with the logo and classification marking of Underwriter’s Laboratories.

Manufacturer must have documented design support information including duct sizing, vent and orifice location, vent and orifice sizing, length, and suspension. Parameters for design, including maximum air temperature, velocity, pressure and fabric permeability, shall be considered and documented.

Manufacturer shall provide a 5 Year Product Warranty for products supplied for the fabric portion of this system as well as a Design and Performance Warranty.

Air diffusers shall be constructed of a woven fire retardant fabric complying with the following physical characteristics:

- 1. Fabric Construction: 100% Flame Retardant***
- 2. Weight: 5.2 oz. /yd² per ASTM D3776***
- 3. Color: Maroon***
- 4. Air Permeability: 2 (+2/-1) cfm/ft² per ASTM D737, Frazier***

5. *Temperature Range: 0 degrees F to 180 degrees F*
6. *Fire Retardancy: Classified by Underwriters Laboratories in accordance with the requirements of NFPA 90-A and AC-167 (noted above).*

Air dispersion shall be accomplished by linear vent and permeable fabric. Linear vent is to consist of an array of open orifices rather than a mesh style vent to reduce maintenance requirements of mesh style vents. Linear vents should also be designed to minimize dusting on fabric surface.

Size of and location of linear vents to be specified and approved by manufacturer.

Inlet connection to metal duct via fabric draw band with anchor patches as supplied by manufacturer.

Anchor patches to be secured to metal duct via zip screw fastener – supplied by contractor.

Inlet connection includes zipper for easy removal / maintenance.

Lengths to include required zippers as specified by manufacturer.

System to include Adjustable Flow Devices to balance turbulence, airflow and distribution as needed. Flow restriction device shall include ability to adjust the airflow resistance from 0.06 – 0.60 in w.g. static pressure.

Fabric system shall include connectors to accommodate suspension system listed below. Any deviation from a straight run shall be made using a gored elbow or an efficiency tee. Normal 90 degree elbows are 5 gores and the radius of the elbow is 1.5 times the diameter of the fabric duct system.

Fabric systems shall be designed for 1.0 inch water gage.

Fabric systems shall be limited to design temperatures between 0 degrees F and 180 degrees F (-17.8 degrees C and 82 degrees C).

Design CFM, static pressure and diffuser length shall be designed or approved by the manufacturer.

The suspension system shall include a double (2 Row) runs of aluminum H-Track system located 1.5” above the 10 and 2 o’clock (2 Row) locations of the system. 2 Row supports are required for systems of 32” diameter and larger. Hardware to include 10’ sections of track, splice connectors, track endcaps and vertical cable support kits – consisting of a length of cable with a locking stud end and Gripple quick cable connectors. Radius aluminum track must be included for all radius sections.

Fabric / Track attachment:

1. *Cord In continuous supporting cord (not suggested for systems >24” Dia.)*
2. *Snap Tabs are a detachable sliding tab positioned every 24” along the length of the system (all diameters).*
3. *Install chosen suspension system in accordance with the requirements of the manufacturer. Instructions for installation shall be provided by the manufacturer with product.*

Clean air handling unit and ductwork prior to the fabric duct system unit-by-unit as it is installed. Clean external surfaces of foreign substance which may cause corrosive deterioration of facing.

Temporary Closure: At ends of ducts which are not connected to equipment or distribution devices at time of ductwork installation, cover with polyethylene film or other covering which will keep the system clean until installation is completed.

If fabric duct systems become soiled during installation, they should be removed and cleaned following the manufacturers standard terms of laundry.

Fabric duct systems shall be Air Distribution Concepts, Duct Sox, or equal.

5) SHEET 8.10 – LEGENDS, SCHEDULES & DETAILS

a) FURNACE SCHEDULE:

i) Revise Note 7 to read:

UNIT TO BE DOWN FLOW TYPE MOUNTED ON SUPPLY PLENUM.

ii) Revise F-1 remarks to be:

1,2,3,4,5,6,7.

iii) Revise F-2 remarks to be:

1,2,3,4,5,6,8.

iv) Note 8 CLARIFICATION: The 4” x 4” treated wood posts are to be mounted horizontally on mezzanine floor.

b) PLUMBING FIXTURE SCHEDULE:

i) Revise “Remarks” for A-2 hose reel to include:

PROVIDE HARDWARE TO MOUNT UNIT BELOW MAXIMUM INSTALLATION HEIGHT. PROVIDE FLEXIBLE HOSE CONNECTION AT INPUT. INSTALL PER MANUFACTURER’S RECOMMENDATIONS.

6) SHEET 8.21 – FLOOR PLAN – PLUMBING & HEATING

a) Provide shut-off valves and drip legs (w/ drain valves) to the piping for all A-2 hose reel connections.

ELECTRICAL ITEMS:

1) SHEET 9.10 – SITE PLAN – ELECTRICAL

a) Reference drawing Sheet 2.60 for the post indicator valve location.

- b) Stub a .75” conduit to the west out of the northwest type “AA” site lighting unit for possible future site lighting units.

2) SHEET 9.21 – FLOOR PLAN – AREA A – POWER & SIGNAL

- a) Note #8 shall read:

“FUEL DISPENSING EMERGENCY OFF” NEMA 3R MUSHROOM HEAD PUSHBUTTON SWITCH. INTERLOCK WITH CONTACTOR “CF”.

- b) Room 100: Add contactor “ELC” (4 poles) adjacent to panel “P2”.
- c) Card Readers: Provide rough-in for card readers and door release devices at doors 100-23, 105, and 109-2. Coordinate requirements with the Owner’s access control system contractor.

GENERAL APPROVALS:

The following material or equipment furnished by the manufacturers listed, may be substituted as equivalent providing that each item, material, and piece of equipment conforms to the design and requirement of the specifications.

<u>SECTION</u>	<u>ITEM</u>	<u>MANUFACTURER</u>
033000	Concrete Densifier / Hardener	LIQUI-HARD; <i>W.R. Meadows</i>
033000	Concrete Sealer	BELLATRIX; <i>W.R. Meadows</i>
033000	Evaporation Retarder	EVAPRE; <i>W.R. Meadows</i>
033000	Under-Slab Vapor Retarder	PERMINATOR HP; <i>W.R. Meadows</i>
220400	Plumbing Fixtures	Gerber
265110/265210	Interior & Exterior Lighting	
	Type E2, E3, E4	Emergi-Lite
	Type F	Columbia
	Type Y, Y1, Y2	Kim

END OF ADDENDUM

SECTION 055100 - METAL STAIRS

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. Industrial-type stairs with steel **[grating]** treads.

- B. Related Sections:

- 1. Section 055213 "Pipe and Tube Railings" for pipe and tube railings.
 - 2. **[Section 061000 "Rough Carpentry"]** for wood blocking for anchoring railings.
 - 3. Section 092216 "Non-Structural Metal Framing" for metal backing for anchoring railings.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

- 1. Uniform Load: **100 lbf/sq. ft. (4.79 kN/sq. m).**
 - 2. Concentrated Load: **300 lbf (1.33 kN)** applied on an area of **4 sq. in. (2580 sq. mm).**
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 - 5. Limit deflection of treads, platforms, and framing members to **[L/360]** or **1/4 inch (6.4 mm)**, whichever is less.

1.4 ACTION SUBMITTALS

- A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

- B. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

1. Industrial-Type Stairs: Industrial class.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so that they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: [ASTM A 500 (cold formed)] [or] [ASTM A 513].
- C. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.
- D. Wire Rod for Grating Crossbars: ASTM A 510 (ASTM A 510M).
- E. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- F. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, [either commercial steel, Type B, or] structural steel, Grade 25 (Grade 170), unless another grade is required by design loads; exposed.
- G. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, [either commercial steel, Type B, or] structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.

2.3 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or **ASTM F 1941 (ASTM F 1941M)**, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, **ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)**; with hex nuts, **ASTM A 563 (ASTM A 563M)**; and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, **ASTM A 563 (ASTM A 563M)**; and, where indicated, flat washers.
 - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts unless indicated otherwise.
- D. Machine Screws: **ASME B18.6.3 (ASME B18.6.7M)**.
- E. Lag Screws: **ASME B18.2.1 (ASME B18.2.3.8M)**.
- F. Plain Washers: Round, **ASME B18.22.1 (ASME B18.22M)**.
- G. Lock Washers: Helical, spring type, **ASME B18.21.1 (ASME B18.21.2M)**.
- H. Post-Installed Anchors: [**Torque-controlled expansion anchors**] [**or**] [**chemical anchors**] capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or **ASTM F 1941 (ASTM F 1941M)**, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Shop Primers: Provide primers that comply with Division 09 painting Sections.
- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.

- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately **1/32 inch (1 mm)** unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for [**Type 2 welds: completely sanded joint, some undercutting and pinholes okay at enclosed stair locations**].
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.6 STEEL-FRAMED STAIRS

- A. Stair Framing:
 - 1. Fabricate stringers of steel [**channels**].
 - a. Provide closures for exposed ends of [**channel**] stringers.
 - 2. Construct platforms of steel [**channel**] headers and miscellaneous framing members as [**needed to comply with performance requirements indicated**]; match stringer framing.
 - 3. Weld stringers to headers; weld framing members to stringers and headers.
 - 4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- B. Metal Bar-Grating Stairs: Form treads and platforms to configurations shown from metal bar grating; fabricate to comply with NAAMM MBG 531, "Metal Bar Grating Manual."
 - 1. Fabricate treads and platforms from [**welded**] steel grating with **1-1/4-by-3/16-inch (32-by-5-mm)** bearing bars at **15/16 inch (24 mm)** o.c. and crossbars at **4 inches (100 mm)** o.c., NAAMM designation: W-15-4 (1-1/4 x 3/16) STEEL.
 - 2. Surface: [**Plain**].
 - 3. Finish: [**Shop primed**].

4. Fabricate grating treads with nosing and with steel angle or steel plate carrier at each end for stringer connections. Secure treads to stringers with bolts.
5. Fabricate grating platforms with nosing matching that on grating treads. Provide toeplates at open-sided edges of grating platforms. Weld grating to platform framing.

2.7 STAIR RAILINGS

- A. Specified in [Section 055213 "Pipe and Tube Railings]."

2.8 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal stairs after assembly.
- C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with [SSPC-SP 3, "Power Tool Cleaning."]
- D. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

- G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."

3.2 INSTALLING METAL STAIRS WITH GROUTED BASEPLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of baseplates.
- B. Set steel stair baseplates on wedges, shims, or leveling nuts. After stairs have been positioned and aligned, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
 - 1. Use nonmetallic, nonshrink grout unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint shall comply with requirements specified in Division 09 painting Sections

END OF SECTION 055100

SECTION 055300 - GRATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the 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. Metal bar gratings.
 - 2. Metal frames and supports for gratings.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Gratings Located in Vehicular Driveways, Subject to Trucking: Provide gratings capable of withstanding the effects of gravity loads according to [**AASHTO H-15 loading**]. Limit deflection to [**L/400**].

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Clips and anchorage devices for gratings.
 - 2. Paint products.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work.

1.5 QUALITY ASSURANCE

- A. Metal Bar Grating Standards: Comply with [**NAAMM MBG 531, "Metal Bar Grating Manual"**] and [**NAAMM MBG 532, "Heavy-Duty Metal Bar Grating Manual"**].
- B. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION

- A. Coordinate installation of anchorages for gratings, grating frames, and supports. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Metal Bar Gratings:
 - a. Alabama Metal Industries Corporation.
 - b. All American Grating, Inc.
 - c. Barnett/Bates Corp.
 - d. Borden Metal Products (Canada) Limited.
 - e. Fisher & Ludlow.
 - f. Grupo Metelmex, S.A. de C.V.
 - g. IKG Industries; a Harsco Company.
 - h. Marwas Steel Co.; Laurel Steel Products Division.
 - i. Ohio Gratings, Inc.
 - j. Seidelhuber Metal Products, Inc.
 - k. Tru-Weld.

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Wire Rod for Grating Crossbars: **ASTM A 510 (ASTM A 510M)**.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type **[304]** stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, **ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6)**; with hex nuts, **ASTM A 563 (ASTM A 563M)**; and, where indicated, flat washers.
- C. Plain Washers: Round, **ASME B18.22.1 (ASME B18.22M)**.
- D. Lock Washers: Helical, spring type, **ASME B18.21.1 (ASME B18.21.2M)**.
- E. Anchors: Provide **[cast-in-place]** anchors with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.

2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
- B. Zinc-Rich Primer: Zinc-rich primer, complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

2.5 FABRICATION

- A. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately **1/32 inch (1 mm)**, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
- D. Fit exposed connections accurately together to form hairline joints.
- E. Welding: Comply with AWS recommendations and the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
- F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.

2.6 METAL BAR GRATINGS

- A. Welded Steel Grating:
 1. At continuous trench drains, trench collection boxes, mud pits and other grating locations subject to heavy vehicular loading, provide bearing bars and cross bars to comply with performance requirements specified.
 - a. Metal grating sections at all 1'-0" wide trenches shall be minimum W19-4 1½ x 1/4; comply with H-15 loading requirements. Supporting frames shall be sized to accommodate grating sections; L1 ¾ x 1 ¾ x 1/4 [**galvanized**] angle framing, unless indicated otherwise.
 - b. Metal grating sections spanning greater than 12" shall be minimum W-19-4 2¼ X 3/8; comply with H-15 loading requirements. Supporting frames shall be sized to accommodate grating sections; L2½ x 2½ x 1/4 [**galvanized**] angle framing, unless indicated otherwise.

- c. All metal bar gratings in Garage 100 shall be banded.
 - d. All metal bar gratings in Garage 100 shall be shop primed.
 - e. Fabricate bar gratings with a maximum gap of 1/8" between the grating sections and the bearing angles. Fabricate bar gratings with a maximum gap of 1/8" between adjacent sections.
 - f. All grating frames and supports embedded in concrete shall be galvanized.
- B. Removable Grating Sections: Fabricate with banding bars attached by welding to entire perimeter of each section. Include anchors and fasteners of type indicated or, if not indicated, as recommended by manufacturer for attaching to supports.
1. Provide no fewer than four weld lugs for each heavy-duty grating section, with each lug shop welded to two bearing bars.
 2. Furnish threaded bolts with nuts and washers for securing grating to supports.
 3. Furnish self-drilling fasteners with washers for securing grating to supports.
 4. Furnish galvanized malleable-iron flange clamp with galvanized bolt for securing grating to supports. Furnish as a system designed to be installed from above grating by one person.
- C. Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.
- D. Do not notch bearing bars at supports to maintain elevation.
- E. Fabricate bar gratings with a maximum gap of 1/8" between the grating sections and the bearing angles. Fabricate bar gratings with a maximum gap of 1/8" between adjacent sections.

2.7 GRATING FRAMES AND SUPPORTS

- A. Frames and Supports for Metal Gratings: Fabricate from metal shapes, plates, and bars of welded construction to sizes, shapes, and profiles indicated and as necessary to receive gratings. Miter and weld connections for perimeter angle frames. Cut, drill, and tap units to receive hardware and similar items.
1. Unless otherwise indicated, use shapes made from [galvanized] steel.
 2. Equip units indicated to be cast into concrete or built into masonry with integrally welded anchors. Unless otherwise indicated, space anchors 24 inches (600 mm) o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches (32 mm) wide by 1/4 inch (6 mm) thick by 8 inches (200 mm) long.

2.8 STEEL FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish gratings, frames, and supports after assembly.
- C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:
1. Interiors (SSPC Zone 1A): SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

- D. Apply shop primer to uncoated surfaces of gratings, frames, and supports, except those with galvanized finishes and those to be embedded in concrete or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
- E. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/ A 123M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing gratings to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry.
- D. Fit exposed connections accurately together to form hairline joints.

3.2 INSTALLING METAL BAR GRATINGS

- A. General: Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
- B. Fabricate and install grating to be installed in sections and lengths that can be removed. Grating sections shall be laid loose in perimeter frame.

3.3 REPAIRS AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C. Touchup Painting: Comply with requirements specified in Division 9 painting Sections.

END OF SECTION 055300

SECTION 093000 - TILING

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. Ceramic and porcelain tile.
2. Crack isolation membrane.
3. Setting materials.
4. Grout materials.
5. Elastomeric sealants.
6. Metal transition strips.
7. Expansion Joints.

B. Related Sections:

1. Section 012300 "Alternates".
2. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
3. Section 092900 "Gypsum Board" for glass-mat, water-resistant backer board.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 1. Level Surfaces:
 - a. Minimum .6 static coefficient of friction over a wet tile surface.

- b. DCOF AcuTest minimum dynamic coefficient of friction .42 for level wet areas.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.
 - 2. Label each sample with manufacturer's name, material description, color, pattern, and designation indicated on drawings and in schedules.

1.6 MATERIALS MAINTENANCE SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to (1) full box for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to (1) full box for each type, composition, and color indicated.

1.7 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - 1. Crack isolation membrane.
 - 2. Metal edge strips.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile of each type from single source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
 - 1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
 - 2. Obtain crack isolation membrane, except for sheet products, from manufacturer of setting and grouting materials.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
 - 1. Crack isolation membrane.
 - 2. Metal edge strips.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 TILE PRODUCTS

- 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. American Olean
 2. Back Bay
 3. Ceramic Tile Works
 4. Crossville
 5. Daltile
 6. Florida Tile
 7. Petra Tile & Stone
 8. Syverson Tile & Stone
 9. Virginia Tile Company
 10. Other – only as approved by Architect in writing prior to bid letting.
- B. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
1. Approved products are listed below for T-1:
 - a. Basis-of-Design Product:
 - 1) Manufacturer: American Olean.
 - 2) Composition: Glazed Ceramic.
 - 3) Series: Profiles.
 - 4) Module Size: 3” x 6”.
 - 5) Color: As selected by Architect from Manufacturer’s full range.
 - 6) Finish: Glossy.
 - 7) Installation: Running bond.
 - 8) Grout Color: As selected by Architect from manufacturer’s full range of colors.
 - 9) Grout Joint Width: As recommended in writing by tile manufacturer.
 - 10) Distributor: Syverson Tile and Stone
 - a) *Representative:* Amy Wollman
 - b) *Email:* awollman@syversontile.com
 - c) *Phone:* (605) 336-1175
 2. Approved products are listed below for T-2:
 - a. Basis-of-Design Product:
 - 1) Manufacturer: American Olean.
 - 2) Composition: Glazed Porcelain.
 - 3) Series: Concrete Chic.
 - 4) Module Size: 12” x 24”.
 - 5) Thickness: 5/16”.
 - 6) Color: As selected by Architect from Manufacturer’s full range.
 - 7) Finish: Matte.
 - 8) Installation: Stack bond.
 - 9) Transitions: Refer to Drawings.
 - 10) Grout Color: As selected by Architect from manufacturer’s full range of colors.
 - 11) Grout Joint Width: As recommended in writing by tile manufacturer.
 - 12) Distributor: Syverson Tile and Stone
 - a) *Representative:* Amy Wollman
 - b) *Email:* awollman@syversontile.com
 - c) *Phone:* (605) 336-1175

2.4 TILE BACKING PANELS: See Section 092900 Gypsum Board.

2.5 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Waterproof Crack Isolation Membrane for wet and dry areas
 - 1. ANSI A118.10 (Waterproof Membrane) and 118.12 (Crack Isolation membrane)
 - 2. Based on TEC – HydroFlex Waterproofing Crack Isolation Membrane

2.6 SETTING MATERIALS

- 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. Ardex Americas.
 - 2. Bonsal American; an Oldcastle company.
 - 3. Bostik, Inc.
 - 4. C-Cure.
 - 5. Custom Building Products.
 - 6. Jamo Inc.
 - 7. Laticrete International, Inc.
 - 8. MAPEI Corporation.
 - 9. Mer-Kote Products, Inc
 - 10. Summitville Tiles, Inc.
 - 11. TEC; H. B. Fuller Construction Products Inc.
- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
 - 1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - 2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.7 GROUT MATERIALS

- A. Grout:
 - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik
 - c. C-Cure.
 - d. Custom Building Products.
 - e. Jamo Inc.
 - f. Laticrete International, Inc.
 - g. MAPEI Corporation.
 - h. TEC; H. B. Fuller Construction Products Inc.
- B. Products: Subject to compliance with requirements, provide products based on the following:
 - 1. High-Performance Tile Grout: ANSI A118.7.
 - a. TEC – Power Grout
 - b. Laticrete - Permacolor Select Grout
 - c. Bostik - TruColor RapidCure Premium Pre-Mixed, Urethane Grout
 - d. Mapei – Flexcolor CQ
 - 2. Color: To be selected by manufacturer's full range of colors.

2.8 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Section 079200 "Joint Sealants."
 - 1. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
- D. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

2.9 METAL TRANSITION STRIPS

- A. Metal edge strips used at all locations where tile meets another type of flooring, outside and inside corners, wall to floor transitions and all crack isolation areas. See drawings for profile types and crack isolation locations.
- B. Movement (Expansion) joints should be provided to *comply with TCA method EJ 171*. Coordinate with architect for locations.
- C. Install transition strips for the following locations. Use in conjunction with its associated inside/outside end/cap accessory pieces.
 - 1. Wall tile caps
- D. Manufacturers for Metal Edge and Strips: Subject to compliance with requirements, provide product by one of the following:
 - a. Blanke Corporation.
 - b. Ceramic Tool Company, Inc.
 - c. Profileitec
 - d. Schluter Systems L.P.
- E. Metal Edge / Strip Basis-of-Design Products:
 - 1. Tile Caps: Utilize metal (cap) trim based on (Schluter Jolly)
 - a. Do not miter the edge, use the outside accessory pieces.
 - b. Finish: AE Satin anodized aluminum or ACG Polished chrome anodized aluminum.

2.10 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.

- C. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
 - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
 - 1. Clean tile with Barkeepers Friend if matte tile should get scratches from installation.
- E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

2.11 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

1. Substrate Moisture Testing: Work of this Section shall include moisture testing concrete floor slabs to determine that substrates meet floor covering manufacturer's installation requirements and are suitable to receive floor coverings.
 - a. All costs associated with moisture testing shall be included in the contractor's Base Bid.
- D. Moisture Testing, General: Perform moisture testing in a manner that ensures that each test area does not exceed [200 sq. ft. (18.6 sq. m)]. Perform no fewer than two tests in each installation area; test areas shall be evenly spaced throughout installation areas. Perform substrate moisture testing as recommended by manufacturer. Proceed with installations only after substrates pass testing.
- E. Moisture Tests: Utilize manufacturer-recommended testing methods to determine substrate moisture levels. Test methods shall include, but not limited to, the following:
 - a. Anhydrous Calcium Chloride Test: Perform anhydrous calcium chloride moisture testing per ASTM F 1869.
 - 1) Adhered Floor Coverings: Proceed with installation only after substrates have maximum moisture-vapor-emission rate of [3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m)] in 24 hours.
 - 2) Non-Adhered Floor Coverings, Including Wood Athletic Floor Systems: Proceed with installation only after substrates have maximum moisture-vapor-emission rate of [4.5 lb of water/1000 sq. ft. (2.04 kg of water/92.9 sq. m)] in 24 hours.
 - b. Plastic Sheet Test: Perform plastic sheet moisture testing according to ASTM D 4263.
 - 1) Proceed with installation only after testing indicates absence of moisture in substrates.
 - 2) Proceed with installation only if there is no evidence of condensation or clouding in 24 hours.
 - c. Relative Humidity Test: Perform relative humidity test using in situ probes according to ASTM F 2170.
 - 1) Proceed with installation only after testing indicates substrates have a maximum [75] percent relative humidity level.
 - d. Other: Perform substrate moisture testing recommended in writing by manufacturer.
 - 1) Proceed with installations only after substrates pass testing.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
- B. Substrate should be plumb and true, surface deviation should not exceed 1/8" in 10'-0". Must use leveling compound to get flatness.
- C. Double coat adhesive for large slabs and heavy traffic.
- D. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- E. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- F. Jointing Pattern: Refer to tile installation pattern in drawings. Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. Per manufacturer's recommendations.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

- J. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated. Do not miter edges, use trim pieces in conjunction with its associated inside/outside accessory pieces. Install stair tread nosing in one continuous piece.
- K. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- L. Rubber Floater: Apply grout with rubber floater when installing matte finished wall tile to avoid scratching the glazed surface.
- M. Flatness and Lippage
 - 1. Porcelain Tiles joint width 1/16" to less than 1/4" – allowable lippage (in) 1/32".
 - 2. Mosaics 1" x 1" to 6" x 6" joint width 1/16" to 1/8" – allowable lippage (in) 1/16".

3.4 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout and mortar residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.6 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, On-Ground Concrete:
 - 1. Tile Installation TCNA F113-18: Thin-set mortar; Advanced Performance grout.

- a. Tile Type: (T-2).
- b. Thin-Set Mortar: Latex- portland cement mortar.
- c. Grout: (Polymer-modified sanded when grout joint is 1/8" or greater) (Polymer-modified unsanded when grout joint is 1/8" or smaller).

B. Interior Wall Installations, Wood or Metal Studs: wet walls not shower area

1. Tile Installation TCNA W245-18: Thin-set mortar on coated glass mat water-resistant gypsum backer board.
 - a. Tile Type: (T-1).
 - b. Thin-set Mortar: Latex-portland cement mortar.
 - c. Grout: (Polymer-modified sanded when grout joint is 1/8" or greater) (Polymer-modified unsanded when grout joint is 1/8" of smaller).
 - d. Use manufacturer's recommendation for grout joints.

END OF SECTION 093000

SECTION 123661 - SIMULATED STONE COUNTERTOPS

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. Solid-surface-material window sills.

1.3 ACTION SUBMITTALS

- A. Product Data: For window sill materials.
- B. Samples for Initial Selection: For each type of material.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of solid surface window sill to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.
- B. Warranty Data: For each type of unit to include in maintenance manuals.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of window sills by field measurements before fabrication is complete.

PART 2 - PRODUCTS

2.1 SOLID-SURFACE-MATERIAL [SSM]

- A. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1 or ICPA SS-1.
 - 1. 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:
 - a. Avonite.
 - b. Corian.

- c. Formica.
- d. Hannex.
- e. Hi-Macs.
- f. LG.
- g. Livingstone.
- h. Wilsonart.
- i. Other – only as approved by Architect in writing prior to bid letting.

B. Solid Surface Window Sills:

- 1. Material: Solid Surface Acrylic.
- 2. Thickness: 1/2" thick solid surfacing material.
- 3. Color: As selected by Architect from manufacturer's full range.
- 4. Finish: Gloss.
- 5. Location: Exterior windows sills; as indicated on drawings.

C. Fabrication: Fabricate units in one piece with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

- 1. Joints: Fabricate without joints.

PART 3 - EXECUTION

3.1 INSTALLATION MATERIAL

- A. Adhesive: As recommended by manufacturer.
- B. Sealants: Comply with applicable requirements in Section 079200 "Joint Sealants".

3.2 EXAMINATION

- A. Examine substrates to receive material and conditions under which solid surface window sill will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of solid surface window sills by manufacturer's instructions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Install level to a tolerance of: 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4" maximum. Do not exceed 1/64" difference between planes of adjacent units.
- B. Finish exposed surfaces smooth and polish to low sheen.
- C. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Shim as needed to align subtops in a level plane. Pre-drill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- D. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants".
- E. Clean all surfaces after installation.

END OF SECTION 123661