



DLR Group

Architecture

Engineering

Planning

Interiors

Lee's Summit Middle School #4

Lee's Summit R-7 School District

Lee's Summit, Missouri

Package 3 – Building & Site

Permit Set

Volume 2 of 4 – Division 08 through Division 14

DLR Group Project No. 13-20102-00

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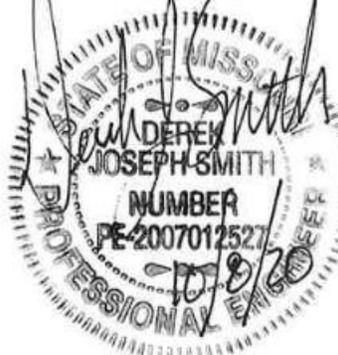
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Scott Pashia

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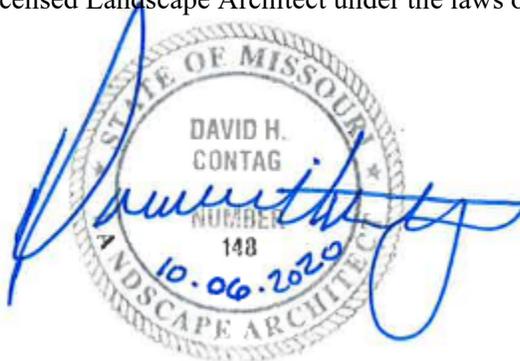
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END OF SECTION 000105

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

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. Standard hollow metal doors and frames.
2. Storm shelter hollow metal doors and frames.

- B. Related Sections:

1. Section 042000 "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Section 087100 "Door Hardware" for door hardware for hollow metal doors.
3. Division 09 painting Sections for field painting hollow metal doors and frames.
4. Division 26 Sections for electrical connections including conduit and wiring for door controls and operators.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.
- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.
- B. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Details of each different wall opening condition.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.

7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification:

1. Samples are only required by request of the Architect and for manufacturers that are not current members of Steel Door Institute.
2. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 125 mm).

E. Other Action Submittals:

1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency showing compliance with requirements in ICC 500 and FEMA 361.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.

1. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

C. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9. Label each individual glazed lite.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to finish of factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.9 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. 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. Steelcraft; an Allegion company.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A60 galvanized metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- G. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- H. Glazing: Comply with requirements in Section 088000 "Glazing."
- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
 - 1. Design: As indicated on Drawings.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 - 3. Vertical Edges for Single-Acting Doors: Beveled edge.
 - a. Beveled Edge: 1/8 inch in 2 inches (3 mm in 50 mm).
 - 4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
 - 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless), 16 gauge face sheet.
 2. Closer Reinforcement: 14 gauge.
 3. High Frequency Hinge Reinforcement
 4. Flush Top Cap
 5. Exterior doors must be insulated to meet an R-value of 10, min.
 6. Full glass doors must have honeycomb core with 18-inch bottom rail.
- C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless), 18 gauge face sheet, unless noted "16 Gauge" in the Door & Frame Schedule.
 2. Closer Reinforcement: 14 gauge.
 3. High Frequency Hinge Reinforcement.
 4. Wood Grain Steel Doors: Provide at all door opening indicated on Sheet A9-00.
 - a. Products: Subject to compliance with requirements, provide the following:
 - 1) Steelcraft; GrainTech Series.
 - a) L-Series GrainTech or T-Series GrainTech as required to maintain proper fire ratings where occur.
 - b. Factory stained finish to selected from manufacturer's full range.
 - c. Core shall be honeycomb.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
1. Hinges: Minimum 0.123 inch (3.0 mm) thick by 1-1/2 inches (38 mm) wide by 6 inches (152 mm) longer than hinge, secured by not less than 6 spot welds.
 2. Pivots: Minimum 0.167 inch (4.2 mm) thick by 1-1/2 inches (38 mm) wide by 6 inches (152 mm) longer than hinge, secured by not less than 6 spot welds.
 3. Lock Face, Flush Bolts, Closers, and Concealed Holders: Minimum 0.067 inch (1.7 mm) thick.
 4. All Other Surface-Mounted Hardware: Minimum 0.067 inch (1.7 mm) thick.
- E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
1. Frames: 16 gauge.
 2. Edge Channels, stops: 16 gauge.
 3. Lock Reinforcement: 14 gauge.
 4. Closer Reinforcement: 14 gauge.
 5. Hinge Reinforcement: 10 gauge, minimum.
 6. High Frequency Hinge Reinforcement.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
1. Fabricate frames with mitered or coped corners.
 2. Frames for Level 3 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
- C. Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.
1. Fabricate frames with mitered or coped corners.
 2. Fabricate frames as welded unless otherwise indicated.
 3. Frames for Level 2 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
 4. Frames for Borrowed Lights: 0.053-inch- (1.3-mm-) thick steel sheet.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.5 HOLLOW METAL DOORS FOR SEVERE STORM SHELTERS

- A. General: Provide complete tornado or hurricane resistant door and frame shelter assemblies constructed to resist the design wind pressures for components and cladding and missile impact loads as described in ICC 500 - 2008, ICC/NSSA “Standard for the Design and Construction of Storm Shelters.” Only single opening and paired opening doors; and their frames constructed to resist calculated design wind pressures and laboratory tested missile impacts are acceptable.
1. Door systems, both single doors and paired openings, tested and complying with ICC 500 and FEMA 361 (2008), Design and Construction Guidance for Community Safe Rooms and supported by third party test results.
 2. Sheets fabricated on exterior openings from commercial quality hot dipped zinc coated steel complying with ASTM A924 A60. Gauges to be in accordance with manufacturers tested assemblies.
 3. Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 4. Top Edge: Reinforce top of doors with a continuous steel channel extending the full width of the door; and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached and welded in place with the web of the

channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.

5. Hinge Reinforcement: Minimum 7 gauge (3/16 inch) plate 1-1/4 inches by 9 inches.
6. Vision Lites: Manufacturer's standard 5-inch wide x 20-inch high proprietary glazing, at maximum height above floor to bottom of glazing of 43-inches to comply with ADA.
7. Doors and frames shall be constructed as required for minimum of 90-minute fire-resistive assemblies.
8. Doors and hardware are tested as an assembly. Coordinate with hardware requirements of Section 087100 "Door Hardware."

B. Doors:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Steelcraft; Paladin Series, or comparable product by one of the following:
 - a. Ceco Door Products.
 - b. Curries Company.
 - c. Republic Doors/Frames.

2.6 HOLLOW METAL FRAMES FOR SEVERE STORM SHELTERS

- A. General: Subject to the same compliance standards and requirements as standard hollow metal frames, provide complete tornado door and frame assemblies, for both single doors and paired openings, tested and labeled as complying with ICC 500 and FEMA 361 and supported by third party test results.

1. Fabricate exterior frames from 14 gauge hot dipped zinc coated steel that complying with ASTM designations A924 A60.

2.7 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.

B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.8 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch (0.8 mm) thick, fabricated from same material as door face sheet in which they are installed.
- B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.
- C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch (0.8 mm) thick, fabricated from same material as frames in which they are installed.

2.9 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 2. Glazed Lites: Factory cut openings in doors.
- D. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - 2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - 6. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches (1524 mm) high.

- 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
- b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
- 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 - 5) Two anchors per head for frames above 42 inches (1066 mm) wide and mounted in metal-stud partitions.
7. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
- a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- F. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
 2. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 3. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.
- G. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 4. Provide loose stops and moldings on inside of hollow metal work.

5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.10 STEEL FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 1. Finish standard steel door and frames after assembly.
- B. Metallic-Coated Steel Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
 1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
- C. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel; comply with SSPC-SP 3, "Power Tool Cleaning," or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils (0.018 mm).
 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.
- E. Factory-Applied Paint Finish: Manufacturer's standard, complying with ANSI A250.3 for performance and acceptance criteria.
 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 - 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable glazing stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.

- f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 5. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
 6. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow metal manufacturer's written instructions.
 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (50 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 083113 - ACCESS DOORS AND FRAMES

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. Access doors and frames for walls and ceilings.
- 2. Security key box (knox box).

- B. Related Sections include the following:

- 1. Section 042000 "Unit Masonry" for anchoring and grouting access door frames set in masonry construction.
- 2. Section 087100 "Door Hardware" for mortise or rim cylinder locks and master keying.
- 3. Section 092900 "Gypsum Board" for anchoring and finishing access door frames set in gypsum board wall assemblies.

1.3 ACTION SUBMITTALS

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

- 1. Include construction details materials, individual components and profiles, and finishes.

- B. Shop Drawings:

- 1. Include plans, elevations, sections, details, and attachments to other work.
- 2. Detail fabrication and installation of access doors and frames for each type of substrate.

- C. Samples: For each door face material, at least 3 by 5 inches (75 by 125 mm) in size, in specified finish.

- D. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Access Panel Solutions.
 2. Acudor Products, Inc.
 3. Alfab, Inc.
 4. Babcock-Davis.
 5. Cendrex Inc.
 6. Elmdor/Stoneman Manufacturing Co.; Div. of Acorn Engineering Co.
 7. Jensen Industries; Div. of Broan-Nutone, LLC.
 8. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
 9. Karp Associates, Inc.
 10. Larsen's Manufacturing Company.
 11. Maxam Metal Products Limited.
 12. Metropolitan Door Industries Corp.
 13. MIFAB, Inc.
 14. Milcor Inc.
 15. Nystrom, Inc.
 16. Williams Bros. Corporation of America (The).
- B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
- C. Flush Access Doors with Exposed Flanges:
1. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.
 2. Locations: Wall and ceiling.
 3. Door Size: See drawings.
 4. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage.
 - a. Finish: Factory prime.
 5. Frame Material: Same material, thickness, and finish as door.
 6. Hinges: Manufacturer's standard.
 7. Hardware: Lock.
- D. Hardware:
1. Lock: Mortise cylinder.
 - a. Lock Preparation: Prepare door panel to accept cylinder specified in Section 087100 "Door Hardware."

2.2 SECURITY KEY BOX (KNOX BOX)

A. Building Access Security Key Box (Knox Box):

1. Basis-of-Design Product: Subject to compliance with requirements, provide Knox Company; Model 3200 Series or an approved equal.
 - a. Type: Small key and data storage cabinet with swing door, recessed mount with alarm tamper switch.
 - b. Location: To be installed in the second phase construction documents. Verify installation location with local fire marshal prior to installation.
 - c. Color: Bronze.

B. Electrical Power Shutdown Key Box (Knox Box):

1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - a. Knox Company; Model 4500 Series.
2. Requirements:
 - a. Location: As indicated on the Drawings. Verify installation location with local fire marshal prior to installation.
 - b. Color: Aluminum.

2.3 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- C. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- D. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
- E. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- F. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of Alloy 5005-H15; with minimum sheet thickness according to ANSI H35.2 (ANSI H35.2M).
- G. Frame Anchors: Same type as door face.

- H. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.4 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
1. For concealed flanges with drywall bead, provide edge trim for gypsum board and gypsum base securely attached to perimeter of frames.
 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
 3. Provide mounting holes in frames for attachment of units to metal or wood framing.
 4. Provide mounting holes in frame for attachment of masonry anchors.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
1. For cylinder locks, furnish two keys per lock and key all locks alike.
 2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

2.5 FINISHES

- 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 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.
- D. Steel and Metallic-Coated-Steel Finishes:
1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

2. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113

SECTION 083313 - COILING COUNTER DOORS

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. Counter doors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of coiling counter door and accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 - 2. Include rated capacities, operating characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
 - 1. Include plans, elevations, sections, and mounting details.
 - 2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
 - 4. Show locations of locking devices and other accessories.
 - 5. Include diagrams for power, signal, and control wiring.
- C. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:
 - 1. Curtain slats.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For coiling counter doors to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
 - 1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

- A. Source Limitations: Obtain coiling counter doors from single source from single manufacturer.

2.2 COUNTER DOOR ASSEMBLY

- A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACME Rolling Doors.
 - b. C.H.I. Overhead Doors.
 - c. Clopay Building Products.
 - d. Cookson Company.
 - e. Cornell Iron Works, Inc.
 - f. McKeon Rolling Steel Door Company, Inc.
 - g. Overhead Door Corporation.
 - h. Raynor.
 - i. Wayne-Dalton Corp.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
 - 1. Include tamperproof cycle counter.
- C. Door Curtain Material: Stainless Steel.
- D. Door Curtain Slats: Flat profile slats of 1-1/4-inch (32-mm) center-to-center height.
- E. Bottom Bar: Manufacturer's standard continuous channel or tubular shape, fabricated aluminum extrusion and finished to match door.

- F. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- G. Hood: Match curtain material and finish.
 - 1. Shape: Square.
 - 2. Mounting: Face of wall.
- H. Sill Configuration: Integral stainless steel counter tops.
- I. Locking Devices: Equip door with locking device assembly.
 - 1. Locking Device Assembly: Single-jamb side locking bars, operable from inside only with cylinders.
- J. Manual Door Operator: Push-up operation
- K. Provide operator with manufacturer's standard removable operating arm.
- L. Curtain Accessories: Equip door with astragal and push/pull handles.
- M. Door Finish: Stainless Steel.

2.3 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate coiling counter-door curtain of interlocking metal slats in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Aluminum Door Curtain Slats: ASTM B209 (ASTM B209M) sheet or ASTM B221 (ASTM B221M) extrusions, alloy and temper standard with manufacturer for type of use and finish indicated; thickness of 0.050 inch (1.27 mm); and as required.
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.4 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

1. Stainless Steel: 0.025-inch- (0.64-mm-) thick, stainless-steel sheet, Type 304, complying with ASTM A 666.

2.5 CURTAIN ACCESSORIES

- A. Astragal: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- B. Push/Pull Handles: Equip each push-up-operated door with lifting handles on each side of door, finished to match door.

2.6 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, seamless or welded carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.
- C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.
- B. 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.

2.8 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install coiling counter doors, hoods, controls, and operators at the mounting locations indicated for each door.

3.3 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Perform installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain coiling counter doors.

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END OF SECTION 083313

COILING COUNTER DOORS

083313 - 6

SECTION 083323 - OVERHEAD COILING DOORS

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. Exterior insulated service doors.

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.
- 2. Division 26 Sections for electrical service and connections for powered operators and accessories.

1.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Overhead coiling doors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

- 1. Component Importance Factor: 1.5.

- B. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.

- 1. Wind Loads: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa), acting inward and outward.

- C. Operation Cycles: Provide overhead coiling door components and operators capable of operating for not less than number of cycles indicated for each door. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
 3. Include description of automatic closing device and testing and resetting instructions.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
1. Include plans, elevations, sections, and mounting details.
 2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
 4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
 5. Show locations of controls, locking devices, detectors or replaceable fusible links, and other accessories.
 6. Include diagrams for power, signal, and control wiring.
- C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
1. Include similar Samples of accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Oversize Construction Certification: For door assemblies required to be fire-rated and that exceed size limitations of labeled assemblies.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
 1. Obtain operators and controls from overhead coiling door manufacturer.

- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- D. Sound-Control Doors: Assemblies that have been fabricated and tested to control the passage of sound and have minimum certified STC rating according to ASTM E 413.
- E. 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.
- F. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch (0.71 mm) and as required to meet requirements.
 - 2. Insulation: Fill slats for exterior doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84. Enclose insulation completely within slat faces.
 - 3. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face.
 - 4. Gasket Seal: Provide insulated slats with manufacturer's standard interior-to-exterior thermal break or with continuous gaskets between slats.
- B. Endlocks and Windlocks for Service Doors: Malleable-iron casings galvanized after fabrication, secured to curtain slats with galvanized rivets or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick; fabricated from manufacturer's standard hot-dip galvanized steel, stainless steel, or aluminum extrusions to match curtain slats and finish.

- D. Astragal for Interior Doors: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- E. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.
- F. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. (0.406 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h) when tested according to ASTM E 283 or DASMA 105.
- G. Operation Cycles: Not less than 10,000.
 - 1. Include tamperproof cycle counter.
- H. STC Rating: 26.

2.2 DOOR ASSEMBLIES

- A. Service, Fire-rated Service, Counter, and Insulated Service Doors: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cookson Company
 - b. ACME Rolling Doors.
 - c. Alpine Overhead Doors, Inc.
 - d. Alumatec Pacific Products.
 - e. Amarr Garage Doors.
 - f. ASTA Door Corporation.
 - g. C.H.I. Overhead Doors.
 - h. City-Gates.
 - i. Clopay Building Products.
 - j. Cornell Iron Works, Inc.
 - k. Janus International Corporation.
 - l. Lawrence Roll-Up Doors, Inc.
 - m. McKeon Rolling Steel Door Company, Inc.
 - n. Metro Door.
 - o. Overhead Door Corporation.
 - p. QMI Security Solutions.
 - q. Raynor.
 - r. Southwestern Rolling Steel Door Co.
 - s. Wayne-Dalton Corp.

2.3 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Galvanized Steel: Nominal 0.028-inch- (0.71-mm-) thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653/A 653M.
 - 2. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.
 - 3. Exterior-Mounted Doors: Fabricate hood to act as weather protection and with a perimeter sealant-joint-bead profile for applying joint sealant.

2.4 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.
- B. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: Cylinders specified in Section 087100 "Door Hardware".
 - 2. Keys: Two for each cylinder.
- C. Chain Lock Keeper: Suitable for padlock.
- D. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.5 CURTAIN ACCESSORIES

- A. Smoke Seals: Equip each fire-rated door with replaceable smoke-seal perimeter gaskets or brushes for smoke and draft control as required for door listing and labeling by a qualified testing agency.
- B. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.
 - 1. At door head, use 1/8-inch- (3-mm-) thick, replaceable, continuous-sheet baffle secured to inside of hood or field- installed on the header.
 - 2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch- (3-mm-) thick seals of flexible vinyl, rubber, or neoprene.

- C. Astragal for Interior Doors: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- D. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
 - 1. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.

2.6 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, seamless or welded carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.
- C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
 - 1. Fire-Rated Doors: Equip with auxiliary counterbalance spring and prevent tension release from main counterbalance spring when automatic closing device operates.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.7 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
 - 1. Comply with NFPA 70.
 - 2. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

- C. Door Operator Location(s): Operator location indicated for each door.
1. Top-of-Hood Mounted: Operator is mounted to the right or left door head plate with the operator on top of the door-hood assembly and connected to the door drive shaft with drive chain and sprockets. Headroom is required for this type of mounting.
 2. Front-of-Hood Mounted: Operator is mounted to the right or left door head plate with the operator on coil side of the door-hood assembly and connected to the door drive shaft with drive chain and sprockets. Front clearance is required for this type of mounting.
 3. Wall Mounted: Operator is mounted to the inside front wall on the left or right side of door and connected to door drive shaft with drive chain and sprockets. Side room is required for this type of mounting. Wall mounted operator can also be mounted above or below shaft; if above shaft, headroom is required.
- D. Electric Motors: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements unless otherwise indicated.
1. Electrical Characteristics:
 - a. Phase: Single phase.
 - b. Volts: 120V.
 - c. Hertz: 60.
 2. Motor Type and Controller: Reversible motor and controller (disconnect switch) for motor exposure indicated.
 3. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
 4. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 5. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.
1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
 - a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.

2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.
- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.
- B. 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.

2.9 STEEL AND GALVANIZED-STEEL FINISHES

- A. Powder-coat Finish: Manufacturer's standard powder-coat finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
 1. Color: As selected by the Architect to match adjacent wall colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.
- D. Power-Operated Doors: Install automatic garage doors openers according to UL 325.

3.3 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Perform installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
 - 3. Test door closing when activated by detector or alarm-connected fire-release system. Reset door-closing mechanism after successful test.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
 - 1. Adjust exterior doors and components to be weather-resistant.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide tight fit around entire perimeter.

3.5 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include six months' full maintenance by skilled employees of coiling-door Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
1. Perform maintenance, including emergency callback service, during normal working hours.
 2. Include 24-hour-per-day, seven-day-per-week, emergency callback service.

3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

SECTION 083326 - OVERHEAD COILING GRILLES

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. Open-curtain overhead coiling grilles.

- B. Related Sections:

- 1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.
- 2. Division 26 Sections for electrical service and connections for powered operators and accessories.

1.3 PERFORMANCE REQUIREMENTS

- A. Operation Cycles: Provide overhead coiling grille components and operators capable of operating for not less than number of cycles indicated for each grille. One operation cycle is complete when a grille is opened from the closed position to the fully open position and returned to the closed position.

1.4 SUBMITTALS

- A. Product Data: For each type and size of overhead coiling grille and accessory. Include the following:

- 1. Construction details, material descriptions, dimensions of individual components, profiles for curtain components, and finishes.
- 2. Operating characteristics and furnished accessories.

- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.

- 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

2. Wiring Diagrams: For power, signal, and control wiring.
 - C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
 1. Include similar Samples of accessories involving color selection.
 - D. Qualification Data: For qualified Installer.
 - E. Maintenance Data: For overhead coiling grilles to include in maintenance manuals.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
 - B. Source Limitations: Obtain overhead coiling grilles from single source from single manufacturer.
 1. Obtain operators and controls from overhead coiling grille manufacturer.
 - C. 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.
 - D. Regulatory Requirements: Comply with applicable provisions in ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 GRILLE CURTAIN MATERIALS AND CONSTRUCTION

- A. Open-Curtain Grilles: Fabricate metal grille curtain as an open network of horizontal rods, spaced at regular intervals, that are interconnected with vertical links, which are formed and spaced as indicated and are free to rotate on the rods.
 1. Stainless-Steel Grille Curtain: ASTM A 666, Type 300 series.
- B. Endlocks: Continuous end links, chains, or other devices at ends of rods; locking and retaining grille curtain in guides against excessive pressures, maintaining grille curtain alignment, and preventing lateral movement.
- C. Bottom Bar: Manufacturer's standard continuous channel or tubular shape, finished to match grille.
 1. Astragal: Equip each grille bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
 2. Provide motor-operated grilles with combination bottom astragal and sensor edge.

- D. Grille Curtain Jamb Guides: Manufacturer's standard shape having curtain groove with return lips or bars to retain curtain. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise; with removable stops on guides to prevent overtravel of curtain.

- 1. Removable Posts and Jamb Guides: Manufacturer's standard.

2.2 HOODS AND ACCESSORIES

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

- 1. Galvanized Steel: Nominal 0.028-inch- (0.71-mm-) thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653/A 653M.

- B. Mounting Frame: Manufacturer's standard mounting frame designed to support grille; factory fabricated from ASTM A 36/A 36M structural-steel tubes, hot-dip galvanized per ASTM A 123/A 123M; fastened to floor and structure above grille; to be built into wall construction; and complete with anchors, connections, and fasteners.

2.3 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

- 1. Lock Cylinders: Provide cylinders standard with manufacturer and keyed to building keying system.
 - 2. Keys: Two for each cylinder.

- B. Safety Interlock Switch: Equip power-operated grilles with safety interlock switch to disengage power supply when grille is locked.

2.4 COUNTERBALANCING MECHANISM

- A. General: Counterbalance grilles by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of parts and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.

- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.5 OPEN-CURTAIN GRILLE ASSEMBLY

- A. Open-Curtain Grille: Overhead coiling grille with a curtain having a network of horizontal rods that interconnect with vertical links.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. AlumaTek, Inc.
 - d. City-Gates.
 - e. Cookson Company.
 - f. Cornell Iron Works, Inc.
 - g. Dynaflair Corporation.
 - h. Dynamic Closures Corp.
 - i. Lawrence Roll-Up Doors, Inc.
 - j. Mahon Door Corporation.
 - k. McKeon Rolling Steel Door Company, Inc.
 - l. Metro Door.
 - m. Overhead Door Corporation.
 - n. Raynor.
 - o. Windsor Door.
- B. Operation Cycles: Not less than 10,000.
 - 1. Include tamperproof cycle counter.
- C. Grille Curtain Material: Stainless steel.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Raynor; Model Number GBA Brick Pattern, or comparable product by one of the manufacturers listed herein.
- D. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.

E. Electric Grille Operator:

1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
2. Operator Location: Top of hood.
3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet (2.4 m) or lower.
4. Motor Exposure: Interior.
5. Electrical Characteristics:
 - a. Phase: Single phase.
 - b. Volts: 120V.
 - c. Hertz: 60.
6. Emergency Manual Operation: Push-up type.
7. Obstruction-Detection Device: Automatic photoelectric sensor.
 - a. Sensor Edge Bulb Color: Black.
8. Control Station: Interior mounted.
9. Other Equipment: Audible and visual signals.

F. Curtain Accessories: Equip grille with push/pull handles.

G. Automatic-Closing Device: Equip overhead coiling grilles with an automatic-closing device complying with the requirement in Division 28 "Access Controls".

H. Grille Finish:

1. Stainless-Steel Finish: No. 4 (polished directional satin).

2.6 ELECTRIC GRILLE OPERATORS

A. General: Electric grille operator assembly of size and capacity recommended and provided by grille manufacturer for grille and operation cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking grille, and accessories required for proper operation.

1. ACME Rolling Doors
2. Alumatec Pacific Products
3. C.H.I. Overhead Doors.
4. Cookson Company
5. McKeon Rolling Steel Door Company

B. Comply with NFPA 70.

1. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- C. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each grille.
- D. Grille Operator Location(s): Operator location indicated for each grille.
 1. Top-of-Hood Mounted: Operator is mounted to the right or left grille head plate, with the operator on top of the grille-hood assembly and connected to the grille drive shaft with drive chain and sprockets. Headroom is required for this type of mounting.
- E. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.
 1. Electrical Characteristics:
 - a. Phase: Single phase.
 - b. Volts: 115 V.
 - c. Hertz: 60.
 2. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate grille in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
 3. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 4. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- F. Limit Switches: Equip motorized grille with adjustable switches interlocked with motor controls and set to automatically stop grille at fully opened and fully closed positions.
 1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in grille opening without contact between grille and obstruction.
 - a. Self-Monitoring Type: Designed to interface with grille operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, grille closes only with sustained or constant pressure on close button.
 2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire configured device designed to interface with grille operator control circuit to detect damage to or disconnection of sensor edge.
 3. Pneumatic Sensor Edge: Automatic safety sensor edge, located within astragal mounted to bottom bar. Contact with sensor activates device.

- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
 - 1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip electrically powered grille with capability for emergency manual operation. Design manual mechanism so required force for grille operation does not exceed 25 lbf (111 N).
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- K. Emergency-Egress Release: Flush, wall-mounted handle mechanism, for accessibility-code-compliant egress feature, not dependent on electric power. The release allows an unlocked grille to partially open without affecting limit switches to permit passage, and it automatically resets motor drive upon return of handle to original position.

2.7 GENERAL FINISH REQUIREMENTS

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

2.8 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install overhead coiling grilles and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling grilles, hoods, and operators at the mounting locations indicated for each grille.
- C. Accessibility: Install overhead coiling grilles, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Perform installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Test grille opening when activated by detector, fire-alarm system, emergency-egress release, or self-opening mechanism as required. Reset grille-opening mechanism after successful test.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that grilles operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling grilles.

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PACKAGE 3 – BUILDING & SITE
LEE'S SUMMIT, MISSOURI

13-20102-00
8 OCTOBER 2020
PERMIT SET

END OF SECTION 083326

OVERHEAD COILING GRILLES

083326 - 9

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

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. Exterior storefront framing.
 - 2. Exterior manual-swing entrance doors.

1.3 DEFINITIONS

- A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 - 2. Dimensional tolerances of building frame and other adjacent construction.
 - 3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Noise or vibration created by wind and by thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Sealant failure.
 - g. Failure of operating units.
- B. Structural Loads:

1. Wind Loads: As indicated on Drawings.
- C. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to L/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
- D. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.
- E. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- F. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- G. Water Penetration under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
1. Maximum Water Leakage: No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior and water that cannot damage adjacent materials or finishes.
- H. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
 - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C).
 - b. Low Exterior Ambient-Air Temperature: 0 deg F (minus 18 deg C).
 3. Interior Ambient-Air Temperature: 75 deg F (24 deg C).
- I. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 62 when tested according to AAMA 1503.
 - J. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than 0.69 Btu/sq. ft. x h x deg F (3.92 W/sq. m x K) when tested according to AAMA 1503.
 - K. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:
 1. Sound Transmission Class (STC): Minimum 37 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
 2. Outdoor-Indoor Transmission Class (OITC): Minimum 37 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.
- B. Include statement indicating distance from manufacturer to Project for each regionally manufactured material.
- C. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Qualification Data: For qualified Installer.

- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.
- G. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
- H. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum entrances & storefronts that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.
- C. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- D. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.
- E. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- F. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
- G. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.
- H. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum."
- I. Preinstallation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

- 1. Failures include, but are not limited to, the following:

- a. Structural failures including, but not limited to, excessive deflection.
- b. Noise or vibration caused by thermal movements.
- c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- d. Water leakage through fixed glazing and framing areas.
- e. Failure of operating components.

- 2. Warranty Period: Two years from date of Substantial Completion.

- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.

- 1. Warranty Period: Ten years from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Entrance Door Hardware:

- 1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Exterior Storefront Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer Company, Inc.; Trifab VG 451T, or equal product by one of the following:

1. Arch Aluminum & Glass Co., Inc.
2. EFCO Corporation.
3. Manko Window Systems Inc.
4. Tubelite.
5. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 3. Extruded Structural Pipe and Tubes: ASTM B 429.
 4. Structural Profiles: ASTM B 308/B 308M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: Framing members are composite assemblies of two separate extruded-aluminum components permanently bonded by an elastomeric material of low thermal conductance.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Glazing Plane: Refer to drawings.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 2. Reinforce members as required to receive fastener threads.
- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.
- E. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.
1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 GLAZING SYSTEMS

- A. Glazing: As specified in Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.5 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Full vision doors and frames:
 - 1. Product: Subject to compliance with requirements, provide the following:
 - a. Special-Lite; LS-15 Wide Stile smooth.
 - 2. Thickness: 1-3/4 inches.
 - 3. Stiles: 4-1/2 inches.
 - 4. Top Rail: 6-1/2 inches.
 - 5. Bottom Rail: 16 inches.
 - 6. Hinge: Refer to Section 087100 "Door Hardware."
 - 7. Mid Panel: Provide SL-484 12-inch mid panel. Finish to match the rest of door. Mount mid panel centered at 39 inches AFF. Integrated recessed pulls shall NOT be used.
 - 8. When doors are framed by glazed storefront components, compatible storefront system by Special-Lite shall be used, in matching finish.
 - 9. Door Design: As indicated on Drawings.
 - a. Accessible Doors: Smooth surfaced for width of door in bottom rail.
 - 10. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.
 - 11. Provide Special-Lite #301 adjustable door bottom in bottom rails of doors.
- B. Entrance Door Hardware: As specified in Section 087100 "Door Hardware."

2.6 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 079200 "Joint Sealants."
 - 1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.762-mm) thickness per coat.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Storefront Framing: Fabricate components for assembly using screw-spline system.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations

in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
 - 1. Color: Black.

2.9 STEEL PRIMING

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying primer.
- B. Surface Preparation: Perform manufacturer's standard cleaning operations to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel.
- C. Priming: Apply manufacturer's standard corrosion-resistant primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Contractor is responsible for field verification of rough openings as construction tolerances may adjust the Aluminum Frame Elevation Drawings in the Construction Documents.

3.2 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.

6. Seal joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

F. Install glazing as specified in Section 088000 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

H. Install perimeter joint sealants as specified in Section 079200 "Joint Sealants" to produce weathertight installation.

3.3 ERECTION TOLERANCES

A. Install aluminum-framed systems to comply with the following maximum erection tolerances:

1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
2. Alignment:
 - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm).
 - b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).

B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.4 ADJUSTING

- A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer.
 - 1. For entrance doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches (75 mm) from the latch, measured to the leading door edge.

END OF SECTION 084113

SECTION 084123 – FIRE RATED ALUMINUM FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:

- 1. Fire rated glazing and framing systems for installation as windows: CFG/CFIG.

- B. Related Sections:

- 1. Section 051200 “Structural Steel Framing” for steel attachment members.
 - 2. Section 072500 “Weather Barriers” for perimeter air, water and vapor seal between the work of this section and adjacent construction.
 - 3. Section 076200 “Sheet Metal Flashing and Trim” for flashing between this work and other work.
 - 4. Section 078413 “Penetration Firestopping” for firestops between work of this section and other fire resistive assemblies.
 - 5. Section 079200 “Joint Sealants” for installation of joint sealants installed with steel fire-rated glazed curtain-wall systems and for sealants to the extent not specified in this Section.
 - 6. Section 084113 “Aluminum Entrance and Storefronts” for entrance and storefront systems.
 - 7. Section 087100 “Door Hardware” for door hardware other than that provided by the work of this section.

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA)

- 1. AAMA 2603-2002 Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 2. AAMA 2604 -2005 Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 3. AAMA 2605 -2005 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. American Society for Testing and Materials (ASTM):

1. Fire safety related:

- a. ASTM E119: Methods for Fire Tests of Building Construction and Materials.

2. Material related:

- a. ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2007.
- b. ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2006b.

3. Exterior-related:

- a. ASTM E 283-04: Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen
- b. ASTM E 330-02: Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference Procedure A
- c. ASTM E 331-04: Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- d. ASTM E 783-02: Test Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors
- e. ASTM E 1105-00: Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference

C. American Welding Society (AWS)

1. AWS D1.3 - Structural Welding Code - Sheet Steel; 2007

D. Builders Hardware Manufacturers Association, Inc.

1. BHMA A156 - American National Standards for door hardware; 2006 (ANSI/BHMA A156).

E. National Fire Protection Association (NFPA):

1. NFPA 80: Fire Doors and Windows.
2. NFPA 251: Fire Tests of Building Construction & Materials
3. NFPA 252: Fire Tests of Door Assemblies
4. NFPA 257: Fire Test of Window Assemblies

F. Underwriters Laboratories, Inc. (UL):

1. UL 9: Fire Tests of Window Assemblies.
2. UL 10 B: Fire Tests of Door Assemblies
3. UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies
4. UL 263: Fire tests of Building Construction and Materials
5. UL-752 Ratings of Bullet-Resistant Materials

G. American National Standards Institute (ANSI):

1. ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings

H. Consumer Product Safety Commission (CPSC):

1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials

I. American Society of Civil Engineers (ASCE)

1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2005

1.4 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass, fabricated glass or framing as defined in referenced glazing publications.

1.5 SUBMITTALS

- A. Submit in accordance with Section 013300 “Submittal Procedures.”

B. Product Data:

1. Technical Information: Submit latest edition of manufacturer’s product data providing product descriptions, technical data, Underwriters Laboratories, Inc. listings and installation instructions.

C. Shop Drawings:

1. Include plans, elevations and details of product showing component dimensions; framing opening requirements, dimensions, tolerances, and attachment to structure

D. Samples (optional). For following products:

1. Glass sample-as provided by manufacturer
2. Sample of frame
3. Verification of sample of selected finish

- E. Glazing Schedule: Use same designations indicated on drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

- F. Warranties: Submit manufacturer’s warranty.

- G. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
 - 1. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction

1.6 QUALITY ASSURANCE

- A. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are classified and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257 and UL 9. For 45-minute assemblies only.
- B. Fire-Rated Wall Assemblies: Assemblies complying with ASTM E119 that are classified and labeled by UL, for fire ratings indicated, based on testing in accordance with UL 263, ASTM E119.
- C. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by Underwriters Laboratories® maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle under provisions specified by manufacturer.

1.8 PROJECT CONDITIONS

- A. Obtain field measurements prior to fabrication of frame units. If field measurements will not be available in a timely manner coordinate planned measurements with the work of other sections.
 - 1. Note whether field or planned dimensions were used in the creation of the shop drawings.
- B. Coordinate the work of this section with others effected including but not limited to: other interior and/or exterior envelope components and door hardware beyond that provided by this section.

1.9 WARRANTY

- A. Provide the Pilkington Pyrostop® and Fireframes® standard five-year manufacturer warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. SAFTI FIRST Fire Rated Glazing Solutions.
 2. Technical Glass Products.
 3. Vetrotech Saint-Gobain.
- B. Glazing Material:
1. Basis-of-Design Product: Pilkington Group; Pilkington Pyrostop® fire-resistance-rated glazing distributed by Technical Glass Products; 8107 Bracken Place SE; Snoqualmie WA 98065; phone 800-426-0279; e-mail sales@fireglass.com; website <http://www.fireglass.com>.
- C. Frame System:
1. Basis-of-Design Product: Technical Glass Products; Fireframes® Aluminum Series fire-rated frame system distributed by Technical Glass Products; 8107 Bracken Place SE; Snoqualmie WA 98065; phone 800-426-0279; e-mail sales@fireglass.com; website <http://www.fireglass.com>.

2.2 PERFORMANCE REQUIREMENTS

- A. System Description:
1. Steel fire-rated glazed wall and/or window system, dual aluminum cover cap format.
 - a. Face Widths:
 - 1) 2 inches.
 - 2) Custom extruded aluminum cover caps
 - 3) Custom stainless steel cover caps
 - b. Duration – Windows: Capable of providing fire ratings indicated on the Drawings.
 - c. Duration – Walls: Capable of providing fire ratings indicated on the Drawings.
- B. Structural Performance:
1. Design and size the system to withstand structural forces placed upon it without damage or permanent set when tested in accordance with ASTM E330 using load 1.5 times the design wind loads and of 10 seconds in duration.
 2. Positive wind load: as indicated on the drawings.
 3. Negative wind Load: as indicated on the drawings.

4. Member Deflection: Limit deflection of the edge of the glass normal to the plane of the glass to flexure limit of glass of any framing member.
 5. Accommodate movement between storefront and adjoining systems.
- C. Air Infiltration: ASTM E 283; Air infiltration rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.24 psf.
- D. Water Resistance, (static): ASTM E 331; No leakage at a static air pressure differential of 15 psf as defined in AAMA 501.

2.3 MATERIALS - GLASS

- A. Low-E Coated glass for use in insulated exterior units. See Section 088000 "Glazing."
- B. Fire Rated Glazing: Composed of multiple sheets of Pilkington Optiwhite™ high visible light transmission glass laminated with an intumescent interlayer: CFG.
- C. Insulated Exterior Units CFG:
1. Outer lite: Low-E coated glass.
 2. Air space/Filler: ½-inch Argon.
 3. Inner lite: Fire-rated glazing with fire-rating(s) indicated on Drawings.
- D. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201(Cat. I and II).

E. Properties Interior Glazing:

Fire-Rating	45 minute	60 minute		120 minute
Manufacturer's designation	45-200	60-101	60-201	120-106
Glazing type	single	single	single	IGU
Nominal Thickness	3/4" (19mm)	7/8" (23mm)	1-1/16" (27mm)	2-1/4" (57mm)
Weight in lbs/sf	9.2	10.85	12.5	22.9
Daylight Transmission	86	87%	86%	75%
Sound Transmission Coefficient	40dB	41dB	44dB	46dB

F. Properties Exterior Glazing:

Fire-Rating	45 minute		60 minute		120 minute
Manufacturer's designation	45-200	45-260 45-360	60-201	60-261 60-361*	120-262 120-362*
Glazing type	single	IGU	single	IGU	IGU
Nominal Thickness	3/4" (19mm)	1-5/16" (33mm)	1-1/16" (27mm)	1-5/8" (41mm)	2-3/8" (60mm) [with 14 mm spacer, or 2- 1/8" (54 mm) with 8 mm

Fire-Rating	45 minute		60 minute		120 minute
					spacer]
Weight in lbs/sf	9.2	12.5	12.5	15.8	22.1
Daylight Transmission	86	77	86%	77%	74%
		59-71		59-70%	33-68%
Sound Transmission Coefficient	40dB	40dB	44dB	44dB	46dB

* Low-E product.

- G. Exterior Grade: PVB inner layer installed toward exterior.
- H. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (UL), fire rating period, safety glazing standards, and date of manufacture.
- I. Glazing Accessories: Manufacturer's standard compression gaskets, standoff, spacers, setting blocks and other accessories necessary for a complete installation.

2.4 MATERIALS –ALUMINUM FRAMES

- A. Aluminum Framing System with fire ratings indicated on the Drawings:
 1. Steel Frame: The steel framing members are made of two halves, nom. 1.9 in. wide (48.3 mm) with a nominal minimum depth of 1.38 in. (35 mm) with lengths cut according to glazing size.
 2. Aluminum Trim: Supplied with the steel framing members. Nominal 2 in. (50.8 mm) wide with a nom. depth of 1.54 in. (39 mm) with lengths cut according to glazing size.
 3. Stainless Steel Standoffs: Supplied with the steel framing members. Nominal 5/16 in. (8 mm) diameter with a nominal minimum depth of 1-1/8 in. (28 mm) with depth adjusted to match Pilkington Pyrostop® panel thickness.
 4. Stainless Steel Moment and Connecting Braces: Supplied with the steel framing members. Nominal 3/8 in. (10 mm) thick with a nominal minimum depth of 1-1/8 in. (28 mm) with depth adjusted to match Pilkington Pyrostop® Panel thickness.
 5. Framing Member Fasteners: Supplied with the steel framing members. Screws are M6 x16mm Button Head Socket Cap Screws for frame assembly and #6 x 1” Pan Head Sheet Metal Screws for door installation.
 6. Glazing Gasket:
 - a. Interior Gasketing-Supplied with the steel framing members. Nominal 3/4 in. (19 mm) x 3/16 (4.5 mm) black applied to the steel framing members to cushion and seal the glazing material when installed.
 - b. Exterior Gasketing- Supplied with the steel framing members. Nominal 2 in. (50 mm) x 3/16 (4.5 mm) black applied to the steel framing members to cushion and seal the glazing material when installed.

- B. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 (ASTM B 221M).
- C. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 611.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 - 1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - 2. Reinforce members as required to receive fastener threads.

2.5 ACCESSORIES

- A. Fasteners: Use fasteners fabricated from Type 304 or Type 316 stainless steel.
- B. Glazing Gaskets:
 - 1. Glazing gaskets for interior or exterior applications: ASTM C 864 (extruded EPDM rubber that provides for silicone adhesion) or ASTM C1115 Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories (extruded silicone).
- C. Intumescent Tape: As supplied by frame manufacturer.
- D. Setting Blocks: 1/4-inch calcium silicate.
- E. Perimeter Anchors: Steel.
- F. Flashings: As recommended by manufacturer; same material and finish as cover caps.
- G. Silicone Sealant: One-Part Low Modulus, neutral cure High Movement-Capable Sealant: Type S; Grade NS; Class 25 with additional movement capability of 100 percent in extension and 50 percent in compression (total 150 percent); Use (Exposure) NT; Uses (Substrates) M, G, A, and O as applicable. (Use-O joint substrates include: Metal factory-coated with a high-performance coating; galvanized steel; ceramic tile.)
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Dow Corning 790, 795 - Dow Corning Corp.
- b. Momentive.
- c. Tremco.

H. Intumescent Caulk: Single component, latex-based, intumescent caulk designed to stop passage of fire, smoke, and fumes through fire-rated separations; permanently flexible after cure; will not support mold growth; flame spread/smoke developed 10/10.

1. Products: Subject to compliance with requirements, provide the following:

- a. 3M; CP-25 WP+.

2.6 SLAG-WOOL-FIBER/ROCK-WOOL-FIBER INSULATION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Fibrex Insulations Inc.
2. Owens Corning.
3. Rockwool.
4. Thermafiber.

B. Unfaced, Slag-Wool-Fiber/Rock-Wool-Fiber Board Insulation: ASTM C 612, maximum flame-spread and smoke-developed indexes of 15 and 0, respectively; passing ASTM E 136 for combustion characteristics; and of the following nominal density and thermal resistivity:

1. Nominal density of 4 lb/cu. ft. (64 kg/cu. m), Types IA and IB, thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).
2. Fiber Color: Regular color, unless otherwise indicated.

2.7 FABRICATION

A. Obtain reviewed shop drawings prior to fabrication.

B. Fabrication Dimensions: Fabricate fire-rated assembly to field dimensions.

C. Factory prepared, fire-rated steel door assemblies by TGP to be prehung, prefinished with hardware preinstalled for field mounting.

D. Field glaze door and frame assemblies.

2.8 FINISHES, GENERAL

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

- B. Finish frames after assembly.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.9 INTERIOR FRAME FINISH

- A. Finish after fabrication.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.
- C. Aluminum Finish for interior frames:
 - 1. Powder-Coat Finish: Polyester Super Durable powder coating which meets AAMA 2604 for chalking and fading. Apply manufacturer's standard powder coating finish system applied to factory-assembled frames before shipping, complying with manufacturer's recommended instructions for surface preparation including pretreatment, application, and minimum dry film thickness.
 - 2. Color and Gloss: As selected by Architect from full range.
 - 3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Tiger Drylac
 - b. Additional manufacturers as approved by TGP

2.10 EXTERIOR FRAME FINISH:

- A. Aluminum Finishes:
 - 1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - 2. Class I, Color Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish.
 - 3. Color: Match exterior aluminum frames.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer's acceptable tolerances.

- B. Notify Architect of any conditions which jeopardize the integrity of the proposed fire wall / door system.
- C. Do not proceed until such conditions are corrected.

3.2 INSTALLATION

- A. See Fireframes Aluminum Series Installation Manual

3.3 REPAIR AND TOUCH UP

- A. Anodized Finishes:
 - 1. Protect the anodized finish from harsh chemicals such as concrete/mortar or muriatic acid/brick wash. If reasonable care is taken during handling and high and low pH chemicals can be avoided, repair and/or touch-up of an anodize finish will not be needed.
 - 2. Some rub marks on an anodized surface can be removed with a mild abrasive pad such as a Scotch-Brite pad prior to touch up painting.
 - 3. Touch-up paint should be used even more sparingly over anodize. Only the visible raw aluminum in the scratch or gouge should be touched up with a matching paint.
- B. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

3.4 PROTECTION AND CLEANING

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
 - 1. Do not clean with astringent cleaners. Use a clean “grit free” cloth and a small amount of mild soap and water or mild detergent.
 - 2. Do not use any of the following:
 - a. Steam jets
 - b. Abrasives
 - c. Strong acidic or alkaline detergents, or surface-reactive agents
 - d. Detergents not recommended in writing by the manufacturer
 - e. Do not use any detergent above 77 degrees F
 - f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
 - g. Metal or hard parts of cleaning equipment must not touch the glass surface
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

- C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 084123

SECTION 084329 - SLIDING MALL FRONTS

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 sliding aluminum-framed glass doors.
- B. Related Requirements:
 - 1. Section 084113 "Aluminum-Framed Entrances and Storefronts" for coordinating finish among aluminum fenestration units on the building interior.
 - 2. Section 087100 "Door Hardware" for hardware not specified in Section 084329.

1.3 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, and fabrication methods, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of sliding storefronts indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For sliding storefronts and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of sliding storefronts. Test results based on use of downsized test units will not be accepted.
- F. Other Action Submittals:
 - 1. Sliding Mall Fronts Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of sliding storefront hardware, as well as procedures and diagrams. Coordinate final sliding storefront hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of sliding storefront hardware.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes, weather stripping, operable panels, and operating hardware to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating sliding storefronts that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain sliding storefront through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of sliding storefronts and are based on the specific system indicated. Refer to Section 016000 "Product Requirements". Do not modify size and dimensional requirements.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.6 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
 - 1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer North America; 1010C, or comparable product by one of the following:
 - 1. Arch Aluminum & Glass Co., Inc.
 - 2. EFCO Corporation.
 - 3. Kawneer North America.
 - 4. Oldcastle Building Envelope.
 - 5. Panda Windows and Doors.
 - 6. TRACO.

7. Tubelite.
8. United States Aluminum.
9. YKK AP America Inc.

- B. Source Limitations: Obtain sliding aluminum-framed glass doors from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Sound Transmission Class (STC): Rated for not less than 32 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- B. Outside-Inside Transmission Class (OITC): Rated for not less than 23 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

2.3 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by sliding storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.090" (2.3 mm) wall thickness at any location for the main frame and sash members.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with sliding storefront members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Sliding-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
 2. Sealant: For sealants required within fabricated sliding storefront, provide sliding storefront manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.4 SLIDING MALL FRONTS

- A. Frames and Door Panels: Fabricated from aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.

1. Thermally Improved Construction: Fabricate frames and door panels with an integral, concealed, low-conductance thermal barrier located between exterior and interior surfaces in a manner that eliminates direct metal-to-metal contact.
- B. Threshold and Sill Cap/Track: Provide extruded-aluminum threshold and track of thickness, dimensions, and profile indicated; designed to comply with performance requirements indicated with manufacturer's standard finish.
 1. Low-Profile Floor Track: ADA-ABA compliant.

2.5 GLAZING

- A. Glass and Glazing System: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed sliding storefront units.
- B. Glass: Comply with Division 08 Section "Glazing" for requirements applicable to safety glazing, insulating-glass units, and laminated glass units.
- C. Glazing System: Glazing method shall be a channel type PVC gasket (marine glazed) which is compatible with aluminum and shall be resistant to deterioration by all forms of weathering and suitably retained to maintain a watertight seal between the glass and the surrounding frame.

2.6 HARDWARE

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock sliding storefronts.
- B. Standard Hardware:
 1. Inboard and Outboard Casters.
 2. Inboard and Outboard Head Guides.
 3. Adams Rite MS 1850A-505 Hookbolt Lock.
 4. Interior and Exterior Cylinders.
 5. Edge Pull.

2.7 ACCESSORIES

- A. Fasteners: Noncorrosive and compatible with door members, trim, hardware, anchors, and other components.
 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- B. Anchors, Clips, and Accessories: Provide anchors, clips, and accessories of aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron for sliding aluminum-framed glass

doors, complying with ASTM B 456 or ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

1. Windborne-Debris Resistance: Provide anchors of same design used in windborne-debris resistance testing.

2.8 FABRICATION

A. General:

1. Fabricate Components per the Manufacturer's most current Installation Instruction manuals with minimum suggested clearances and shim spacing around the perimeter of the assembly while enabling installation and dynamic movement of the perimeter seal.
 2. Accurately fit and secure all joints and corners. Make joints flush, hairline and waterproof.
 3. Prepare frames to receive anchor devices as required.
 4. When possible, arrange fasteners and attachments to conceal from view.
 5. Shop assemble frames to the greatest extent possible and shop seal all horizontal to vertical joints.
- B. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.
- C. Factory-Glazed Fabrication: Glaze sliding aluminum-framed glass doors in the factory where practical and possible for applications indicated. Comply with requirements in Section 088000 "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440.

2.9 GENERAL FINISH REQUIREMENTS

- A. Comply with AAMA-AFPA "Anodic Finishes/Painted Aluminum" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

2.10 ALUMINUM FINISHES

- A. Black Anodic Finish: AAMA 611, Architectural Class I Coating (Color #29 Black) (Standard) or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight sliding storefront installation.
 - 1. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing sliding storefronts, hardware, accessories, and other components.
- B. Install sliding storefronts level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install sliding storefronts and components to drain condensation, water penetrating joints, and moisture migrating within sliding storefront to the exterior.
- E. Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

- B. Clean aluminum surfaces immediately after installing sliding storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean factory-glazed glass immediately after installing sliding storefronts. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect sliding storefront surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor sliding storefront surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, mortar, alkaline deposits, stains, or other contaminants. If contaminating substances do contact sliding storefront surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION 084329

SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes aluminum windows for exterior locations.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
 - 1. Include similar Samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum windows and components required, showing full range of color variations for finishes, and prepared on Samples of size indicated below:
 - 1. Exposed Finishes: 2 by 4 inches.
 - 2. Exposed Hardware: Full-size units.
- E. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and Installer.
- B. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.

- C. Field quality-control reports.
- D. Sample Warranties: For manufacturer's warranties.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.
- B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.
- C. Performance Requirements: The design wind loads for the Project are indicated on structural drawings. All structural components, including meeting rails, mullions and anchors shall be designed accordingly.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Window: 5 years from date of Substantial Completion.
 - b. Glazing Units: Five years from date of Substantial Completion.
 - c. Aluminum Finish: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain aluminum windows from single source from single manufacturer.
- B. Manufacturers: Subject to compliance with requirements, provide product by one of the following:

ALUMINUM WINDOWS

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1. Kawneer North America; an Alcoa company.
2. Oldcastle.
3. Wausau Windows.
4. YKK AP America Inc.

2.2 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
- B. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of:
 1. Horizontal Sliding: 0.45 Btu/sq. ft. x h x deg F.
- C. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of:
 1. Horizontal Sliding: 0.27.
- D. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 45 to 65.
- E. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change: 120 deg F, ambient; 180 deg F material surfaces.
- F. Sound Transmission Class (STC): Rated for not less than 31 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- G. Life Cycle Testing:
 1. When tested in accordance with AAMA 910, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing.
 - a. Air infiltration and water resistance tests shall meet the primary performance requirements specified after completion of cycling.
- H. Air, Water and Structural Performance Requirements:
 1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA/WDMA/CSA 101/I.S.2/A440 for Architectural AW Performance Class windows, Performance Grade 90 (AW90) unless otherwise noted herein.

- a. Test units shall not be smaller in either width or height than the “Gateway Test Size” specified in AAMA/WDMA/CSA 101/I.S.2/A440 for AW Performance Class.
 - b. “Downsize” testing to meet Optional Performance Class requirements specified herein shall not be permitted.
 - c. Test units shall employ manufacturer’s standard sealing, lock spacing and anchorage.
2. Air Test Performance Requirements:
- a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.
3. Water Test Performance Requirements:
- a. No uncontrolled water leakage at 15.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accord with both ASTM E331 and ASTM E547. Complete successful Category 10 pulsed pressure differential testing at 14 psf to 42 psf, with water application rate of 5 gallons/hr/sq ft when tested in accord with ASTM 2268 and AAMA 520.
4. Structural Test Performance Requirements:
- a. Uniform Load Deflection Test:
 - 1) No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 100 psf (design test pressure) when tested in accord with ASTM E330.
 - b. Uniform Load Structural Test:
 - 1) Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330.
 - 2) No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

2.3 ALUMINUM WINDOWS

- A. Operating Types: Provide the following operating types in locations indicated on Drawings:
1. Horizontal sliding.
 2. Fixed.
- B. Frames and Sashes: Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.

1. Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.
 - C. Glazing: 1/4-inch thick clear tempered glass.
 - D. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
 - E. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
 - F. Horizontal-Sliding Window Hardware:
 1. Sill Cap/Track: Extruded-aluminum track with natural anodized finish of dimensions and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior.
 2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only. Provide custodial locks.
 3. Roller Assemblies: Low-friction design.
 - G. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
 - H. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- 2.4 ACCESSORIES
- A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.
 - B. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.
 - C. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.

2.5 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze aluminum windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
- E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.
- F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
 - 1. Anodic finish shall be continuous, fully sealed and free from powdery surfaces.
- C. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker, black.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
 - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
 - 2. Air-Infiltration Testing:
 - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.

SECTION 085680 – PASS-THROUGH WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes:
 - 1. Aluminum, medium-duty commercial sliding service windows.

1.3 SUBMITTALS

- A. Product Data: Submit Manufacturer's technical product data substantiating that products comply.
- B. Shop Drawings: Submit for fabrication and installation of windows. Include details, elevations and installation requirement of finish hardware and cleaning.
- C. Certification: Provide printed data in sufficient detail to indicate compliance with the contract documents.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver windows crated to provide protection during transit and job storage
- B. Inspect windows upon delivery for damage. Unless minor defects can be made to meet the Architect's specifications and satisfaction, damaged parts should be removed and replaced.
- C. Store windows at building site under cover in dry location.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.6 WARRANTY

- A. All material and workmanship shall be warranted against defects for a period of one (1) year from the original date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Product: Subject to compliance with requirements, provide C.R. Laurence Co., Inc.; SW Series Aluminum Frame Sliding Service Windows.

2.2 MATERIALS

- A. Frames: Aluminum frame modules shall be constructed of 6063-T5 extruded aluminum. Window glides on top-hung nylon slides. Poly-pile weather stripping and slide locks. Overall frame sizes are to be in accordance with the contract drawings.
- B. Finish: All aluminum to be black anodized, Architectural Class I min.
- C. Glazing: Tempered 1/4-inch glazing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install window in accordance with manufacturer's printed instructions and recommendations. Repair damaged units as directed by the manufacturer and the Architect or replace with new units.

3.2 CLEANING

- A. Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer's instructions. Remove excess glazing sealant compounds, dirt or other substances.

3.3 PROTECTION

- A. Institute protective measures required throughout the remainder of the construction period to ensure that all the windows do not incur any damage or deterioration, other than normal weathering, at the time of acceptance.

LEE'S SUMMIT MIDDLE SCHOOL #4
PACKAGE 3 – BUILDING & SITE
LEE'S SUMMIT, MISSOURI

13-20102-00
8 OCTOBER 2020
PERMIT SET

END OF SECTION 085680

PASS THROUGH WINDOWS

085680 - 3

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Intent: The intent of this Section is to provide finish hardware for the proper operation and control of all wood, hollow metal and aluminum doors in the Project. Prior to bidding, notify the Architect of any doors that do not have hardware meeting this intention.
- B. This Section includes items known commercially as finish or door hardware that are required for swinging doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed. This Section includes, but is not necessarily limited to furnishing and installing complete, the following:
 - 1. Finish hardware for proper operation and control of all wood, aluminum and hollow metal doors, including hinges, locks and latch sets, closers, panic devices, autoflushbolts, electric strikes, magnetic holders, removable mullions, cylinders, keys, miscellaneous stops, flat goods, weatherstripping and thresholds as required.
 - 2. Cylinder for access doors where specified.
- C. Related work in other sections:
 - 1. Section 081113 “Hollow Metal Doors and Frames” for hollow metal doors, frames and silencers.
 - 2. Section 084113 “Aluminum-Framed Entrances and Storefronts.”
 - 3. Section 084123 “Fire-Rated Aluminum Framed Storefronts.”
 - 4. Division 28 sections for access control.

1.3 DEFINITIONS

- A. "Finish Hardware" includes items known commercially as finish hardware which are required for swing, and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data for each hardware item. Include information necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finishes.
1. Manufacturer shall submit written certification confirming closers compliance with U.L. 10C.
- B. Hardware Schedule: Submit a hardware schedule in a vertical format (horizontal format not acceptable), organized into sets, including the information below. Designations for door numbers and hardware sets in the schedule shall match those used in the Construction Documents for each opening.
1. Hardware Schedule shall be coordinated with doors, frames, and related work to ensure proper size, thickness, hand function, and finish of door hardware.
 2. Catalog cuts of each type of exposed hardware unit, highlighted in color to indicate compliance with the Hardware Schedule.
 3. Type, style, function, size and finish of each hardware item.
 4. Name and manufacturer of each item.
 5. Fastenings and other pertinent information.
 6. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
 7. Mounting locations for hardware.
 8. Door and frame sizes and materials.
 9. Deviations from Specifications shall be noted in cover letter.
- C. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.
- D. Keying Schedule: Submit separate detailed schedule, at the same time as the Hardware Schedule, indicating keying for all locks and how Owner's instructions, on keying of locks has been fulfilled. Keying schedule must be approved before ordering any locks.
- E. Pinning Transcript: Submit detailed schedule indicating each lock cylinder and core.
- F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

- B. **Product/Material Qualifications:** Manufacturer's product numbers are indicated for convenience in identifying finish hardware items. Unless otherwise indicated, manufacturer's description for indicated product number constitutes minimum standards of quality, design, function and performance required for each item to be incorporated into the Project.
1. It will be the responsibility of the Bidder to furnish with his Bid a list clarifying any deviations from these specifications written or implied, in order that a fair and proper evaluation be made. Those Bidders not submitting a list of deviations will be presumed to have Bid as specified.
- C. **Supplier Qualifications:** A recognized Architectural Finish Hardware Supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years. Supplier shall be or employ an experienced Architectural Hardware Consultant (AHC) who is certified by and member of the Door and Hardware Institute. The Architectural Hardware Consultant shall be available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.
1. Supplier shall meet with the Owner to finalize keying requirements and obtain final instructions in writing.
- D. **Fire-Rated Openings:** Provide hardware for fire-rated openings in compliance with NFPA Pamphlets No. 80, No. 101 and of authorities having jurisdiction requirements. Provide only hardware which has been tested and listed by UL, FM or Warnock Hersey for types and sizes of doors required and complies with requirements of door and door frame labels.
1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware".
- E. **Standards:** Comply with the requirements of the latest edition of the following standards, unless indicated otherwise:
1. American National Standards Institute (ANSI) Publications:
 - a. A115 Series - Door and Frame Preparation.
 - b. A156 Series - Hardware.
 2. Builders Hardware Manufacturers Association (BHMA) Publications:
 - a. 1201 - Auxiliary Hardware.
 - b. 1301 - Materials and Finishes.
 3. Door and Hardware Institute (DHI) Publications:
 - a. Keying - Procedures, Systems, and Nomenclature.
 - b. Abbreviations and Symbols.
 - c. Hardware for Labeled Fire Doors.

- d. Recommended Locations for Builder's Hardware for Standard and Custom Steel Doors and Frames.
 - e. Wood Door Standards W1, W2, WDHS-2, WDHS-3.
4. National Fire Protection Association (NFPA) Publications:
- a. NFPA Pamphlet No. 80 - Standards for Fire Doors and Windows.
5. International Building Code - current edition as adopted.
6. Americans with Disabilities Act (ADA).
- F. Keying Conference: Conduct conference in accordance with Section 013100. In addition to Owner, Construction Manager, and Architect, conference participants shall also include Installer's Architectural Hardware Consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 2. Preliminary key system schematic diagram.
 3. Requirements for key control system.
 4. Address and timeframe for delivery of keys and cores.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Section 013100 "Project Management and Coordination" as follows:
1. Architectural Finish Hardware supplier (AFHS) shall conduct the preinstallation conference at the site. The AFHS shall instruct finish hardware installer on proper installation, adjustment and troubleshooting for each operable item of finish hardware specified. The AFHS shall observe the installation and adjustment of the first three locksets, closers and exit devices.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Package each hardware item in separate containers with all screws, wrenches, installation instructions and installation templates. Mark or tag each box with hardware heading and door number according to approved hardware schedule.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation. Provide a complete packing list showing items, door numbers and hardware headings with each shipment.
- D. Store hardware in shipping cartons above ground and under cover to prevent damage.

1. Provide secure lockup for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.
- E. Aluminum Door Hardware - Deliver hardware for aluminum doors as directed by the door supplier for factory installation by the aluminum door manufacturer.
- F. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.7 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.8 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 HARDWARE - GENERAL

- A. Provide the materials or products indicated by trade names, manufacturer's name, or catalog number.
- B. Provide manufacturer's standard products meeting the design intent of this Specifications, free of imperfections affecting appearance or serviceability.
 1. Base Metals: Produce hardware units of basic metal and forming method indicated using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units for finish designations indicated.
 2. Provide hardware complete with all fasteners, anchors, instructions, layout templates, and any specialized tools as required for satisfactory installation and adjustment.

3. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
 4. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated or approved. Finish screws exposed under any condition to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as
 5. Finish all other hardware in accordance with the BHMA finish as follows, unless otherwise indicated in manufacturers screws to secure hardware.
 6. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use through-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where indicated otherwise or where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex bolt fasteners.
 7. Provide factory pinned cylinders and cores.
- C. Hardware is specified in the hardware schedule by set, type, and functions which have been selected as best meeting the application requirements. Acceptable products for each category are specified under PART 2 of this Specification.

2.2 SPECIAL REQUIREMENTS

A. Hinges:

1. Provide non-removable pins for all exterior doors and out-swinging corridor doors. Use nonrising pins for all other doors.
2. Pre-drill pilot holes for hinge fasteners at factory to suit hinge type.
3. Provide pivots or continuous hinges where specified.

B. Locksets:

1. All locksets shall meet or exceed ANSI Grade 1 requirements.

C. Electronic Locksets:

1. Lock Functions: As indicated in door hardware schedule. Reference Access Control Specification for more details.

D. Panic Devices:

1. Exit devices are to incorporate a flush and tapered end cap.
2. Hardware mullions are to be of the same manufacturer as the panic device. Provide keyed mullions unless otherwise specified. Provide mullion storage kits where specified.
3. Provide recessed in door low profile exit devices where specified.
4. Provide electrical options as specified.

E. Closers:

1. Comply with manufacturer's recommendations for unit size based on door size, weather exposure and usage.
2. Provide parallel arms for all overhead closers, except as otherwise indicated.
3. Through-bolt all closer units, using sex bolt fasteners.
4. All surface closers shall exceed ANSI A156.4 Grade 1 requirements in all aspects as called for below. All closers shall have certification by an independent testing laboratory of 10,000,000 cycles without failure. Provide special rust inhibitive primer (SRI) where specified.
5. Closers shall maintain control of the door in all conditions. Closers shall have 3 non-critical adjusting valves: latch, main and backcheck. Where specified backcheck shall take affect at 45 (AVB) degrees of opening for parallel arm closers and 70 degrees for regular arm closers. Closers with pressure relief valves are not acceptable.
6. Closer cylinders shall be cast iron. Closer pinions shall be dual heat treated. Pinion and piston shall be steel alloy. Piston diameter shall be minimum 1-1/2 inches.
7. Furnish all brackets, drop plates and any other necessary hardware required to insure proper installation.

2.3 KEYING

- A. Keying shall be accomplished at hardware manufacturer's plant where adequate records are maintained in order to avoid duplication of changes.
- B. Cylinders to be keyed to the districts existing master system. Exterior doors to have Schlage Primus cylinders. Interior doors to have Schlage cylinders. Hardware supplier to verify proper key system. Keying schedule must be approved by the Owner prior to ordering locks.
 1. Provide the correct type of cylinder for each hardware application, and supplying cylinder with correct tailpiece and/or cam.
- C. Key all locks separately, or alike, as directed by the Owner's representative and Architect.
- D. Provide keys as follows:
 1. Change Keys: Three (3) per lock.
 2. Master Keys: Three (3) required (per system).
 3. Grand Master Keys: Five.
- E. Identification: Stamp all (master-type) keys with the following:
 1. Do Not Duplicate.
 2. Key change number (all keys).
- F. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 1. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

2.4 KEY CONTROL SYSTEM

- A. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by Telkee or equal products by the following:
1. HPC.
 2. Lund.
- B. Requirements:
1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
 - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
 - b. Provide hinged-panel type cabinet for wall mounting.

2.5 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

- A. Requirements:
1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
 2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
 3. Gasketing and astragals on aluminum frames by door manufacturer.

2.6 SILENCERS

- A. Requirements:
1. Provide "push-in" type silencers for hollow metal or wood frames.
 2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
 3. Omit where gasketing is specified.

2.7 HARDWARE FINISHES

- A. Provide matching finishes for hardware units at each door to the greatest extent possible, unless otherwise indicated. In general, match items to the finish for the latch, lock or push-pull unit for color and texture.

1. Product description or schedule:

- a. 626 satin chrome-plated.
- b. 630 satin stainless steel.

2.8 HARDWARE PRODUCTS

A. Hinges:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by IVES Hardware; an Allegion Company or equal product by one of the following:

- a. Hager Companies.
- b. McKinney Products Company; an ASSA ABLOY Group company.
- c. Stanley Commercial Hardware; Div. of The Stanley Works.

B. Continuous Gear-Type Hinges:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by IVES Hardware; an Allegion Company or equal product by one of the following:

- a. Hager Companies.
- b. Select Products Limited.
- c. Zero International.

C. Locksets:

1. Manufacturer: Subject to compliance with requirements, provide products by the following; no substitutions; products to match District standard.

- a. Schlage Commercial Lock Division; an Allegion Company.

D. Exit Devices:

1. Manufacturer: Subject to compliance with requirements, provide products by the following; no substitutions; products to match District standard.

- a. Von Duprin; an Allegion Company

E. Closers:

1. Manufacturer: Subject to compliance with requirements, provide products by the following; no substitutions; products to match District standard.

- a. LCN Closers; an Allegion Company.

F. Automatic Operators:

1. Manufacturer: Subject to compliance with requirements, provide products by the following; no substitutions; products to match District standard.
 - a. LCN Closers; an Allegion Company.

G. Flatgoods:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by IVES Hardware; an Allegion Company or equal product by one of the following:
 - a. Burns.
 - b. Trimco.

H. Stops:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by IVES Hardware; an Allegion Company or equal product by one of the following:
 - a. Burns Manufacturing Incorporated.
 - b. Trimco

I. Overhead stops:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by Glynn-Johnson; an Allegion Company or equal product by one of the following:
 - a. Architectural Builders Hardware Mfg., Inc.
 - b. Door Controls International.
 - c. Trimco.

J. Thresholds:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by Zero International, or equal product by one of the following:
 - a. National Guard Products.
 - b. Reese Enterprises.

K. Door Gasketing:

1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by Zero International, or equal product by one of the following:
 - a. National Guard Products.

- b. Reese Enterprises.
- L. Weatherstripping:
- 1. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by Zero International, or equal product by one of the following:
 - a. National Guard Products.
 - b. Reese Enterprises.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Carefully inspect doors, frames, and conditions under which hardware will be installed. Notify the Architect of any conditions that would adversely affect the installation or subsequent door operations. Do not proceed until unsatisfactory conditions are corrected.
 - 1. Frames shall be verified, inspected, and confirmed by General Contractor as being plumb and true.
- B. Refer to other Division 08 Sections where doors are specified for additional installation requirements.
- C. Prior to hardware installation, the Hardware Supplier shall meet with the Owner's Representative, Architect, and Hardware Installer to ensure the Installer has and understands the manufacturers' installation requirements for all hardware items.
 - 1. The Supplier shall observe the installation of the first lockset, closer and panic device.

3.2 INSTALLATION

- A. Mount Hardware units at heights indicated in respective DHI Standards, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.
- B. Install each hardware item in compliance with the manufacturer's instructions and written recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be field finished, coordinate removal, storage and reinstallation or application of surface protections with finishing work. Do not install surface-mounted items until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
 - 1. Special care shall be taken to avoid damaging surrounding surfaces.

- D. Provide fasteners and anchoring devices of suitable size, quantity, and type to secure hardware in proper position for heavy use and long life.
 - 1. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Adjust door closers immediately upon installation. Adjust in exact conformance with manufacturer's printed instructions. Advance backcheck to eliminate shock at dead stop. Set latching speed to assure unassisted positive latching.
 - 1. Degrees of swing of doors for self-limiting closers shall be maximum available.
- F. Install each protection plate with a thinly-spread spot of mastic at its center to assure even contact before fastening with screws. Install all such plates on visual centers of closed doors. Set bottom edges of all such plates flush with door bottom.
- G. Cut and fit thresholds to door frame profiles. Prepare thresholds for the attachment of strikes and clearance for spindles as required. Set thresholds in a continuously laid bed of polyisobutylene mastic sealant to completely fill voids and exclude moisture from every source.
- H. Seal weather protection components attached to the exterior sides of doors and frames, such as drip caps and weatherstripping, in place with clear silicone caulk in such a manner as to ensure a continuously filled seam throughout the joinery.
- I. Cut and fit weatherstripping accurately to provide the greatest possible continuity of the contact element. Adjust closer templating as required.
- J. At exterior doors, obtain satisfactory operation of the installation, then apply a thin layer of clear silicone caulk under hinge leaves, and outside lock trim. Remove excess caulk after torquing fasteners.

3.3 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
 - 1. Clean adjacent surfaces soiled by hardware installation.
- B. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.4 INSTRUCTION AND INSPECTION

- A. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.
- B. After hardware is installed and adjusted, the Supplier shall inspect the job with the Architect and the Contractor to determine if the hardware is functioning properly.
 - 1. Maintain the instruction sheets, layout templates, and any supplementary literature regarding hardware in a readable condition. Transmit all such items to the Owner's Representative, together with all spare parts, specialized tools, other accessories supplied with the hardware, and a copy of the approved hardware schedule at the time of instruction.
- C. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units at no cost to the Owner. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.5 DOOR HARDWARE SCHEDULE

- A. The hardware sets listed below represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process.

B. Hardware Sets:

Hardware Group No. 001

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-NL-OP-110MD- CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	689	LCN
1	EA	WEATHER RING	8310-801 (AT EXTERIOR ACTUATOR)	PLA	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	FLOOR STOP	FS444	626	IVE
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	RAMP THRESHOLD	R050 SIA X RCE	AL	NGP
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. PANIC MAY BE DOGGED (MADE PUSH/PULL) ELECTRONICALLY. OUTSIDE ACTUATOR ONLY OPERABLE WHEN DOOR IS DOGGED OR AFTER VALID CARD READ, INSIDE ACTUATOR ALWAYS OPERABLE. ALWAYS FREE EGRESS.

Hardware Group No. 002

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-NL-OP-110MD- CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	689	LCN
1	EA	WEATHER RING	8310-801 (AT EXTERIOR ACTUATOR)	PLA	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	RAMP THRESHOLD	R050 SIA X RCE	AL	NGP
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. PANIC MAY BE DOGGED (MADE PUSH/PULL) ELECTRONICALLY. OUTSIDE ACTUATOR ONLY OPERABLE WHEN DOOR IS DOGGED OR AFTER VALID CARD READ, INSIDE ACTUATOR ALWAYS OPERABLE. ALWAYS FREE EGRESS.

Hardware Group No. 003

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-NL-OP-110MD- CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	689	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	DOOR SWEEP	8192AA	AA	ZER
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. PANIC MAY BE DOGGED (MADE PUSH/PULL) ELECTRONICALLY. OUTSIDE ACTUATOR ONLY OPERABLE WHEN DOOR IS DOGGED OR AFTER VALID CARD READ, INSIDE ACTUATOR ALWAYS OPERABLE. ALWAYS FREE EGRESS.

Hardware Group No. 004

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-NL-OP-110MD- CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	RAMP THRESHOLD	R050 SIA X RCE	AL	NGP
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. PANIC MAY BE DOGGED (MADE PUSH/PULL) ELECTRONICALLY. ALWAYS FREE EGRESS.

Hardware Group No. 005 - Not Used

Hardware Group No. 006

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-EO-CON 24 VDC	626	VON
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	RAMP THRESHOLD	R050 SIA X RCE	AL	NGP
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. PANIC MAY BE DOGGED (MADE PUSH/PULL) ELECTRONICALLY. ALWAYS FREE EGRESS.

Hardware Group No. 007

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	99-EO	626	VON
1	EA	ACCESSORY	LESS DOGGING PLATE	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	RAMP THRESHOLD	R050 SIA X RCE	AL	NGP
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	WHT	SCE
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

Hardware Group No. 008

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-EO	626	VON
1	EA	PRIMUS MORT. CYL.	20-700	626	SCH
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	RAMP THRESHOLD	R050 SIA X RCE	AL	NGP
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	WHT	SCE
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

Hardware Group No. 009

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	REMOVABLE MULLION	KR4954	689	VON
2	EA	PANIC HARDWARE	99-EO	626	VON
2	EA	ACCESSORY	LESS DOGGING PLATE	626	VON
1	EA	PRIMUS MORT. CYL.	20-700	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8195AA	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	WHT	SCE
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 010

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
8	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	REMOVABLE MULLION	KR4954	689	VON
2	EA	PANIC HARDWARE	99-EO	626	VON
2	EA	ACCESSORY	LESS DOGGING PLATE	626	VON
1	EA	PRIMUS MORT. CYL.	20-700	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8195AA	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	WHT	SCE
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 011

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW NRP	630	IVE
2	EA	ACCESSORY	LESS DOGGING PLATE	626	VON
2	EA	PANIC HARDWARE	WS-9927-EO	626	VON
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	328AA-S	AA	ZER
1	EA	ASTRAGAL (SET)	8195AA	AA	ZER
2	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	WHT	SCE
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 012

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-NL-CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 013

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-L-06-CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS444	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED, UNLESS OUTSIDE TRIM UNLOCKED BY KEY. WHEN LOCKED, ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 014

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-L-06-CON 24 VDC	626	VON
1	EA	PRIMUS RIM CYLINDER	20-757	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED, UNLESS OUTSIDE TRIM UNLOCKED BY KEY. WHEN LOCKED, ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 015

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	EU MORTISE LOCK	L9092TEU 06A RX 12/24 VDC	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
2	EA	SURFACE CLOSER	4040XP HCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	ASTRAGAL (SET)	8195AA	AA	ZER
2	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOORS NORMALLY CLOSED AND LOCKED. ENTRY BY VALID CARD READ. INSIDE LEVER ALWAYS FREE EGRESS.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 016

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092TEU 06A RX 12/24 VDC	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
1	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR ALWAYS CLOSED AND LOCKED. ENTRY BY VALID CARD READ. INSIDE LEVER ALWAYS FREE EGRESS.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 017

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	OFFICE/ENTRY LOCK	L9050T 06A 09-544	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 018

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER
1	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 019

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	630	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
2	EA	OH STOP	100S	630	GLY
2	EA	SILENCER	SR64	GRY	IVE

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 020

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	STOREROOM LOCK	L9080T 06A	630	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	OH STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 021

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
2	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	65A-223	A	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR CONTACT MONITORS DOOR POSITION.

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 022

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	OFFICE W/SIM RETRACT	L9056T 06A L583-363 L283-722	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS444	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 023

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW NRP	630	IVE
1	EA	CLASSROOM DEADBOLT	B663T	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS444	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	8197AA	AA	ZER
1	EA	THRESHOLD	102A	A	ZER

NOTE: INSTALL WEATHERSTRIP AT FRAME HEAD FIRST, THEN INSTALL CLOSER PA BRACKET ON WEATHERSTRIP.

Hardware Group No. 024

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	DUMMY PUSH BAR	330	626	VON
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O

Hardware Group No. 025

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	DUMMY PUSH BAR	330	626	VON
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	DOOR SWEEP	8192AA	AA	ZER
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O

Hardware Group No. 026

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-99-EO-CON 24 VDC	626	VON
1	EA	90 DEG OFFSET PULL	8190HD 10"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	DOOR SWEEP	8192AA	AA	ZER
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	WEATHERSTRIP	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. PANIC MAY BE DOGGED (MADE PUSH/PULL) ELECTRONICALLY. ALWAYS FREE EGRESS.

Hardware Group No. 027

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
1	EA	REMOVABLE MULLION	KR4954	689	VON
1	EA	PANIC HARDWARE	99-EO	626	VON
1	EA	PANIC HARDWARE	99-L-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	MORTISE CYLINDER	26-091	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
2	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	ASTRAGAL (SET)	326AA-S	AA	ZER
1	EA	GASKETING	8144SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
2	EA	DOOR BOTTOM	365AA	AA	ZER
1	EA	THRESHOLD	544A	A	ZER

Hardware Group No. 028

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	FIRE EXIT HARDWARE	9947-L-BE-F-LBR-06	626	VON
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER

Hardware Group No. 029

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	PANIC HARDWARE	9947-L-LBR-06	626	VON
2	EA	RIM CYLINDER	20-057	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA (RHR LEAF)	689	LCN
1	EA	SURFACE CLOSER	4040XP SCUSH (LHR LEAF)	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	8144SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER

Hardware Group No. 030

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
1	EA	REMOVABLE MULLION	KR4954	689	VON
2	EA	PANIC HARDWARE	99-L-06	626	VON
2	EA	RIM CYLINDER	20-057	626	SCH
1	EA	MORTISE CYLINDER	26-091	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	8144SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER

Hardware Group No. 031

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	FIRE EXIT HARDWARE	WS-9927-L-F-06	626	VON
2	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 032

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PANIC HARDWARE	99-L-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 033

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PANIC HARDWARE	99-L-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE CLOSER	4040XP HCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 034

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	99-L-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN

Hardware Group No. 035

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PANIC HARDWARE	99-L-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 036

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PANIC HARDWARE	99-L-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	870AA-S	AA	ZER
1	EA	DOOR BOTTOM	365AA	AA	ZER
1	EA	THRESHOLD	544A	A	ZER
2	EA	CLOSER/STOP MOUNTING BRACKET	870SPB		ZER

Hardware Group No. 037

FOR USE ON DOOR #(S):

PROVIDE EACH DE DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	PANIC HARDWARE	9947-EO-LBR	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	8144SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 038

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	FIRE EXIT HARDWARE	9947-L-BE-F-LBR-06	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

OPERATION: DOORS TO RELEASE UPON SIGNAL FROM FIRE ALARM.

Hardware Group No. 039

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	FIRE EXIT HARDWARE	9947-L-F-LBR-06	626	VON
2	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

OPERATION: DOORS TO RELEASE UPON SIGNAL FROM FIRE ALARM.

Hardware Group No. 040

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	PANIC HARDWARE	9947-L-BE-LBR-06	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	8144SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

OPERATION: DOORS TO RELEASE UPON SIGNAL FROM FIRE ALARM.

Hardware Group No. 041

FOR USE ON DOOR #(S):

PROVIDE EACH DE DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	FIRE EXIT HARDWARE	9947-EO-F-LBR	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

OPERATION: DOORS TO RELEASE UPON SIGNAL FROM FIRE ALARM.

Hardware Group No. 042

FOR USE ON DOOR #(S):

PROVIDE EACH DE DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	FIRE EXIT HARDWARE	9947-EO-F-LBR	626	VON
2	EA	FIRE/LIFE CLOSER	4040SE WMS 24V/120V AC/DC AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FLOOR STOP	FS436	626	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

OPERATION: DOORS TO RELEASE UPON SIGNAL FROM FIRE ALARM.

Hardware Group No. 043

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-9947-EO-F-LBR	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-LC-QEL-9947-L-F-LBR-06 24 VDC	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	ASTRAGAL	8193AA	AA	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY HELD OPEN. DOOR TO CLOSE AND LOCK UPON FIRE/SECURITY COMMAND. WHEN CLOSED ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

Hardware Group No. 044

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-9947-EO-LBR	626	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-9947-L-LBR-06 24 VDC	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	8144SBK PSA	BK	ZER
2	EA	ASTRAGAL	8193AA	AA	ZER
2	EA	DOOR CONTACT	679-05 HM/WD AS REQ'D	BLK	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY HELD OPEN. DOOR TO CLOSE AND LOCK UPON FIRE/SECURITY COMMAND. WHEN CLOSED ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

Hardware Group No. 045

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	628	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-9947-EO-LBR	626	VON
1	EA	ELEC PANIC HARDWARE	RX-LC-QEL-9947-L-LBR-06 24 VDC	626	VON
2	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
2	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
2	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
2	EA	DOOR CONTACT	7764	628	SCE
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR NORMALLY HELD OPEN. DOOR TO CLOSE AND LOCK UPON SECURITY COMMAND. WHEN CLOSED ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

Hardware Group No. 046

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	628	IVE
2	EA	PANIC HARDWARE	9947-L-BE-LBR-06	626	VON
2	EA	SURFACE CLOSER	4040XP HEDA	689	LCN
2	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
2	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
2	EA	WALL STOP	WS406/407CCV	630	IVE

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 047

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PANIC HARDWARE	99-L-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 048

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PANIC HARDWARE	99-L-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 049

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	FIRE EXIT HARDWARE	99-L-F-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 050

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	FIRE EXIT HARDWARE	99-L-F-2SI-06	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	RIM CYL THUMBTURN	XB11-979	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 051

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	99-L-BE-06	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN

Hardware Group No. 052

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	99-EO	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN

Hardware Group No. 053

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	99-L-BE-06	626	VON
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA (IF REQ'D)	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 (IF REQ'D)	689	LCN
1	EA	FLOOR STOP	FS444	626	IVE

Hardware Group No. 054

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80P6DEU RHO RX CON 12V/24V DC	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
2	EA	WIRE HARNESS	CON X LENGTH REQ'D		SCH
1	EA	POWER SUPPLY	BY SECURITY SYSTEM INTEGRATOR		B/O
1	EA	CARD READER	BY SECURITY SYSTEM INTEGRATOR		
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: DOOR ALWAYS CLOSED AND LOCKED. ENTRY BY CARD READER. INSIDE LEVER ALWAYS FREE EGRESS.

Hardware Group No. 055

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA (AT RATED DOORS)	BK	ZER
3	EA	SILENCER	SR64 (AT NON-RATED DOORS)	GRY	IVE

Hardware Group No. 056

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64 (AT NON-RATED DOORS)	GRY	IVE

Hardware Group No. 057

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA (AT RATED DOORS)	BK	ZER
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 058

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA (ACTIVE LEAF)	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 059

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 060

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	OH STOP	90S (INACTIVE LEAF)	630	GLY
1	EA	SURFACE CLOSER	4040XP HCUSH (ACTIVE LEAF)	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 061

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
			(INACTIVE LEAF)		
1	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
			(ACTIVE LEAF)		
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 062

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
			(INACTIVE LEAF)		
1	EA	SURFACE CLOSER	4040XP HCUSH	689	LCN
			(ACTIVE LEAF)		
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	SET	ASTRAGAL (SET)	326AA-S	AA	ZER
1	SET	GASKETING	870AA-S	AA	ZER
2	EA	DOOR BOTTOM	365AA	AA	ZER
1	EA	THRESHOLD	544A	A	ZER
2	EA	CLOSER/STOP MOUNTING BRACKET	870SPB		ZER

Hardware Group No. 063

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 064

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	4031 (REG MOUNT - 180 DEG)	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 065

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP HCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 066

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 067

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 068

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP (W/ SPECIAL TEMPLATE ST-1630)	689	LCN
1	EA	TOP JAMB MTG PLATE	4040XP-18TJ	689	LCN

Hardware Group No. 069

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	GASKETING	870AA-S	AA	ZER
1	EA	DOOR BOTTOM	365AA	AA	ZER
1	EA	THRESHOLD	544A	A	ZER

Hardware Group No. 070

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 071

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	SURFACE CLOSER	4040XP HCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 072

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 073

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 074

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 075

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 076

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 077

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 078

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 079

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 080

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	OH STOP	90S J	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 081

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	OH STOP	90S J	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 082

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
1	EA	OH STOP	90S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 083

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 084

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	OFFICE/ENTRY LOCK	L9050P 06A 09-544 L283-711	626	SCH
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 085

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 086

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	SURFACE CLOSER (ACTIVE LEAF)	4040XP RW/PA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 087

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	SURFACE CLOSER	4031 H (REG MOUNT - 180 DEGREE) (ACTIVE LEAF)	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 088

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
2	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	4031 (REG MOUNT - 180 DEG)	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 089

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	DBL CYL STORE LOCK	ND66P6D RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	8144SBK PSA	BK	ZER
1	EA	DOOR BOTTOM	361AA	AA	ZER

Hardware Group No. 090

FOR USE ON DOOR #(S):

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	EXIT X BLANK OUTSIDE	ND25D RHO	626	SCH
2	EA	SURFACE CLOSER	4040XP HW/PA	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	ASTRAGAL (SET)	8193AA	AA	ZER

Hardware Group No. 091

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

NOTE: PROVIDE FLOOR STOP IN LIEU OF WALL STOP WHERE REQUIRED.

Hardware Group No. 092

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	626	SCH
1	EA	OH STOP	90S J	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 093

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PRIVACY LOCK	ND40S RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 094

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	OFFICE W/SIM RETRACT	L9056P6 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 095

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HWSC 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 096

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HWSC 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850 AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 097

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE

Hardware Group No. 098

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 099

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW	652	IVE
1	EA	CLASSROOM DEADBOLT	B663P6	626	SCH
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 100

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	MAGNETIC LOCK	M490P	628	SCE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	PUSH BUTTON	621RD DP 12/24 VDC	630	SCE
1	EA	POWER SUPPLY	PS902 900-2RS-FA	LGR	SCE
1	EA	WIRING DIAGRAM	BY SECURITY SYSTEM INTEGRATOR		

OPERATION: THIS ROOM IS UNUSED DURING NORMAL OPERATION. WHEN A CHILD MUST BE DETAINED, HE OR SHE IS PLACED INSIDE THE ROOM, DOOR IS CLOSED AND STAFF HOLDS DOWN THE WALL MOUNT PUSHBUTTON OUTSIDE THE ROOM.

THE WALL MOUNT PUSHBUTTON IS A MOMENTARY SWITCH AND MUST REMAIN DEPRESSED BY A TEACHER OR AIDE DURING THE TIME OF CONFINEMENT. FAILURE TO DEPRESS THE PUSH BUTTON WILL ALLOW FOR THE STUDENT TO LEAVE THE ROOM. FAILURE OF ELECTRICAL POWER WILL UNLOCK MAGNETIC LOCK AND ALLOW THE STUDENT TO LEAVE THE SPACE. THE MAGNETIC LOCK IS ALSO TO BE TIED TO THE FIRE ALARM SYSTEM AND RELEASE UPON FIRE ALARM ACTIVATION.

THIS LOCKING CONDITION IS SUBJECT TO APPROVAL BY THE LOCAL AUTHORITY HAVING JURISDICTION.

Hardware Group No. 101

FOR USE ON DOOR #(S):

PROVIDE EACH SL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	MORTISE CYLINDER	26-091	626	SCH

NOTE: BALANCE OF HARDWARE BY DOOR SYSTEM MANUFACTURER. VERIFY CYLINDER TYPE/QUANTITY REQUIRED WITH DOOR MANUFACTURER.

Hardware Group No. 102

FOR USE ON DOOR #(S):

PROVIDE EACH FLD DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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NOTE: ALL HARDWARE BY DOOR SYSTEM MANUFACTURER.

Hardware Group No. 103

FOR USE ON DOOR #(S):

PROVIDE EACH RU DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	DOOR CONTACT	674-OH	628	SCE
1			(WHERE REQUIRED) HARDWARE BY DOOR / FRAME MANUFACTURER		

LEE'S SUMMIT MIDDLE SCHOOL #4
PACKAGE 3 – BUILDING & SITE
LEE'S SUMMIT, MISSOURI

13-20102-00
8 OCTOBER 2020
PERMIT SET

Hardware Group No. G001

FOR USE ON DOOR #(S):

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1 EA	PANIC HARDWARE	LD-98-EO-WH	630	VON

NOTE: BALANCE OF HARDWARE BY FENCING/GATE MANUFACTURER.

END OF SECTION 087100

SECTION 088000 - GLAZING

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. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Doors.
 - 2. Storefront framing.
- B. Related Sections include the following:
 - 1. Section 081113 "Hollow Metal Doors and Frames" for glazing in hollow metal doors.
 - 2. Section 084113 "Aluminum-Framed Entrances and Storefronts" for glazing in aluminum storefront framing entrance doors.
 - 3. Section 088853 "Security Glazing" for bullet resistant glazing.

1.3 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

- E. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: As indicated.
 - b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
 - 1) Load Duration: 60 seconds or less.
 - c. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch, whichever is less.
 - 1) For insulating glass.
 - d. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
 - e. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.
 - C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation 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.
 - D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch- wide interspace.
4. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F.
5. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
6. Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- square Samples for glass.
 1. Insulating glass for each designation indicated.
 2. Each type of laminated glass with colored interlayer.
 3. For silicone-coated spandrel glass.
 4. For each color (except black) of exposed glazing sealant indicated.
- C. Quality Assurance Submittals;
 1. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
 2. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
 3. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
 4. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
 5. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
 - a. Insulating glass.
 - b. Glazing gaskets.
 6. SWRI Validation Certificate: For each elastomeric glazing sealant specified to be validated by SWRI's Sealant Validation Program.
- D. Closeout Submittals:
 1. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations for Tinted Glass: Obtain tinted, heat-absorbing, and light-reducing float glass from one primary-glass manufacturer for each tint color indicated.
- C. Source Limitations for Coated Glass: Obtain coated glass from one manufacturer for each type of coating and each type and class of float glass indicated.
- D. Source Limitations for Insulating Glass: Obtain insulating-glass units from one manufacturer using the same type of glass and other components for each type of unit indicated.
- E. Source Limitations for Laminated Glass: Obtain laminated-glass units from one manufacturer using the same type of glass lites and interlayers for each type of unit indicated.
- F. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- G. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
 - 1. Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Glass Testing Agency Qualifications: An independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- H. VOC Limits: Use glazing sealant that complies with VOC limits of Bay Area Air Quality Management District Regulation 8, Rule 51.
- I. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
 - 1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
 - 3. Test elastomeric glazing sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- J. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.

1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - a. Perform tests under normal environmental conditions replicating those that will exist during installation.
 2. Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, and insulating units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).
 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
 5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.
- K. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
- L. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines," and SIGMA TB-3001, "Sloped Glazing Guidelines."
- M. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
1. Insulating Glass Certification Council.
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
 - B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

1.9 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Special Warranty on Coated-Glass Products: Written warranty, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: Five years from date of Substantial Completion.
- D. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Basis-of-Design Products: Subject to compliance with requirements, provide either the named product indicated in schedules at the end of Part 3 or a comparable product by one of the other manufacturers specified.

2.2 PRIMARY FLOAT GLASS

- A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

- A. Fabrication Process: By vertical (tong-held) or horizontal (roller-hearth) process, at manufacturer's option, except provide horizontal process where indicated as tongueless or free of tong marks.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

2.4 COATED FLOAT GLASS

- A. General: Provide coated glass complying with requirements indicated in this Article and in schedules at the end of Part 3.
 - 1. Provide Kind HS (heat-strengthened) coated float glass in place of coated annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.
- B. Sputter-Coated Float Glass: Float glass with metallic-oxide or metallic-nitride coating deposited by vacuum deposition process after manufacture and heat treatment (if any), complying with requirements specified in schedules at the end of Part 3.
- C. Silicone-Coated Spandrel Glass: ASTM C1048, Type I, Condition C, Quality-Q3.
 - 1. Manufacturer: Subject to compliance with requirements, provide the following:
 - a. Vitro ICD Coatings; Opaci-Coat 300.

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
 - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.

- B. Security Glazing: Security glass and surrounding frames shall demonstrate the ability, through independent third party testing, to provide the following attributes:
1. Products will be tested as a whole system, including glass and doors or frame.
 2. Products tested shall be tested in full size, actual doors and framing members usable in a commercial setting as applicable to project requirements, with security glazing installed as prescribed by the security glazing manufacturer. Testing shall not be done in framing other than what is specified in regard to quality or manufacturer as stated in the Contract Documents.
 3. Glass bite during testing shall be no more than the allowable glass bite in the specified door or framing system for this project.
 4. The security glass shall resist attack for a minimum of 6 minutes or greater to meet the desired level of protection required by owner.
 5. Attack duration shall be continuous. Breaks between testing phases shall not be counted or timed for total duration.
 6. Security glass will be integrated into a framing system in such a way that the frame and glass are able to withstand a constant attack for 6 minutes.
 7. Attack resistance shall mean the security glazing is subjected to the following without failure:
 - a. Withstand a minimum of 5 shots from a military style assault rifle with a minimum caliber of 7.62 mm.
 - b. Withstand a minimum of abuse as applied by a single assailant at full force and including strikes with feet, bricks, hammers, baseball bats, and sledgehammers without stoppage for 6-12 minutes.
 8. Failure is defined as a tear in the security glass large enough to allow an object 4-inches in diameter or more to pass through or separation made between the glass and surrounding door frame, storefront or curtain wall framing materials.
 9. Product shall not be damaged or scratched by scissors, writing implements, razor blades or the use of any similar sharp object.
 10. Glass shall not have an optical haze of more than 1.8% so glass is indistinguishable from standard tempered glass.
- C. Test reports from a recognized independent testing company shall show testing means and methodology consistent or similar to the 5-aa1 assault test.

2.6 INSULATING GLASS

- A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.
1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

- B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
- C. Sealing System: Dual seal, with primary and secondary sealants as follows:
 - 1. Manufacturer's standard sealants.
- D. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
 - 1. Aluminum with mill or clear-anodized finish.
 - 2. Desiccant: Molecular sieve or silica gel, or blend of both.
 - 3. Corner Construction: Manufacturer's standard corner construction.

2.7 ELASTOMERIC GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
 - 1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.
- B. Elastomeric Glazing Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied, chemically curing sealant in the Glazing Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.
 - 1. Additional Movement Capability: Where additional movement capability is specified in the Glazing Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements in ASTM C 920 for uses indicated.

2.8 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tape: Closed-cell, PVC foam tape; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:
1. Type 1, for glazing applications in which tape acts as the primary sealant.
 2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
1. Neoprene, ASTM C 864.
 2. EPDM, ASTM C 864.
 3. Silicone, ASTM C 1115.
 4. Thermoplastic polyolefin rubber, ASTM C 1115.
 5. Any material indicated above.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
1. Neoprene.
 2. EPDM.
 3. Silicone.
 4. Thermoplastic polyolefin rubber.
 5. Any material indicated above.

2.10 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.11 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.

3.8 MONOLITHIC FLOAT-GLASS SCHEDULE

- A. Uncoated Clear Float Glass CG/CTG: At interior vestibule conditions and where glass as designated below is indicated, provide Type I (transparent glass, flat), Class 1 (clear) glass lites complying with the following:
 - 1. Uncoated Clear Float Glass: Annealed or Kind HS (heat strengthened), Condition A (uncoated surfaces) where heat strengthening is required to resist thermal stresses induced by differential shading of individual glass lites and to comply with performance requirements. Provide Kind FT (fully tempered) where safety glass is indicated
 - 2. Thickness: 6 mm.

3.9 INSULATING-GLASS SCHEDULE

- A. Low-E Insulating Glass, Clear CIG/CTIG: Provide low-emissivity insulating-glass units complying with the following:
 - 1. Basis-of-Design Product: The design for low-E insulating glass tinted is based on Vitro Architectural Glass; Solarban 90. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - a. Cardinal IG.
 - 2. Overall Unit Thickness and Thickness of Each Lite: 25 and 6 mm.
 - 3. Interspace Content: Argon.
 - 4. Indoor Lite: Type I (transparent glass, flat), Class 1 (clear) float glass.
 - 5. Outdoor Lite: Type I (transparent glass, flat) float glass.

- a. Class 1 (clear).
6. Low-Emissivity Coating: Sputtered on second surface.
7. Visible Light Transmittance: 51%.
8. Winter Nighttime U-Value: 0.24.
9. Summer Daytime U-Value: 0.28.
10. Solar Heat Gain Coefficient: 0.23.
11. Outdoor Visible Reflectance: 12%.

3.10 LAMINATED GLASS SCHEDULE

- A. Glass Type CLG: Clear laminated glass with two plies of annealed float glass.
 1. Basis-of-Design Product: SG4 by School Guard Glass as manufactured by Laminated Technologies Inc. (844) 744-5277 or approved equal.
 - a. Childgard Security Glazing by Global Security Glazing
 2. Minimum Thickness of Each Glass Ply: 1/8 inch.
 3. Interlayer Thickness: 1/8 inch.
 4. Safety glazing required.
 - a. Security glazing shall have the following characteristics
 - 1) No more than 4.1 lbs. per square foot
 - 2) 5-aa1 rated for a minimum of 6 minutes
 - 3) Glass clad on interior and exterior surfaces
 - 4) Optical haze of no more than 1.8%
- B. Low-E Insulating Glass, Clear CLIG: Provide low-emissivity laminated security insulating-glass units complying with the following:
 1. Basis-of-Design Product: The design for low-E insulating glass tinted is based on Vitro Architectural Glass; Solarban 90. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - a. Cardinal IG.
 2. Overall Unit Thickness and Thickness of Each Lite: 25, 6 mm outer lite, 9 mm laminated lite.
 3. Interspace Content: Argon.
 4. Indoor Lite: Laminated Glass Type CLG.
 5. Outdoor Lite: Type I (transparent glass, flat) float glass.
 - a. Class 1 (clear).
 6. Low-Emissivity Coating: Sputtered on second surface.
 7. Visible Light Transmittance: 51%.

8. Winter Nighttime U-Value: 0.24.
9. Summer Daytime U-Value: 0.28.
10. Solar Heat Gain Coefficient: 0.23.
11. Outdoor Visible Reflectance: 12%.

3.11 SPANDREL INSULATING GLASS SCHEDULE

A. Spandrel Insulating Glass SIG: Silicone-coated, low-E, insulating spandrel glass.

1. Basis-of-Design Product: ICD High Performance Coatings.
2. Coating Color: To be selected by Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch (25 mm).
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: Clear heat-strengthened float glass.
6. Interspace Content: Argon.
7. Indoor Lite: Clear heat-strengthened float glass.
8. Coating Location: Fourth surface.
9. Winter Nighttime U-Factor: 0.30 maximum.
10. Summer Daytime U-Factor: 0.30 maximum

3.12 GLAZING SEALANT SCHEDULE

A. Low-Modulus Nonacid-Curing Silicone Glazing Sealant: Where glazing sealants of this designation are indicated, provide products complying with the following:

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning; 790.
 - b. Pecora Corporation; 890.
 - c. Tremco, Inc.; Spectrem 1.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Additional Movement Capability: 100 percent movement in extension and 50 percent movement in compression for a total of 150 percent movement.
5. Use Related to Exposure: NT (nontraffic).
6. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.
 - a. Use O Glazing Substrates: Coated glass, aluminum coated with a high-performance coating, brick, limestone, precast concrete, and galvanized steel.
7. Applications: Aluminum entrances, and window glazing applications, including interior and exterior perimeter joints of aluminum frames in exterior walls.

B. Medium-Modulus Neutral-Curing Silicone Glazing Sealant: Where glazing sealants of this designation are indicated, provide products complying with the following:

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning; 791.
 - b. Dow Corning; 795.
 - c. Dow Corning; 799.
 - d. GE Silicones; Silglaze II.
 - e. GE Silicones; Silpruf.
 - f. GE Silicones; UltraPruf SCS2300.
 - g. Pecora Corporation; 864.
 - h. Pecora Corporation; 895.
 - i. Tremco, Inc.; Spectrem 2.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.
 - a. Use O Glazing Substrates: Coated glass, aluminum coated with a high-performance coating, brick, limestone, precast concrete, and galvanized steel.
6. Applications: Aluminum entrances, and window glazing applications, including interior and exterior perimeter joints of aluminum frames in exterior walls.

END OF SECTION 088000

SECTION 088853 - SECURITY GLAZING

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 glass-clad polycarbonate for the following applications:
 - 1. Interior borrowed lites.

1.3 DEFINITIONS

- A. Glazing Manufacturers: Firms that produce primary glass, monolithic plastic glazing, or fabricated security glazing, as defined in referenced glazing publications.
- B. Interspace: Space between lites of air-gap security glazing or insulating security glazing.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on security glazing, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Security Glazing Schedule: List security glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings. Indicate coordinated dimensions of security glazing and construction that receives security glazing, including clearances and glazing channel dimensions.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of product indicated, from manufacturer.
- B. Product Test Reports: For each type of security glazing, for tests performed by manufacturer and witnessed by a qualified testing agency.

- C. Product Test Reports: For each type of glazing sealant, for tests performed by a qualified testing agency.
 - 1. Provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating Security Glazing Units with Sputter-Coated, Low-E Coatings: A qualified insulating glazing manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glazing installers for this Project who are certified under the National Glass Association Glazier Certification Program.
- C. Security Glazing Testing Agency Qualifications: Subject to compliance with requirements, testing agency is one of the following:
 - 1. H. P. White Laboratory, Inc.
 - 2. Underwriters Laboratories, Inc.
 - 3. Wiss, Janney, Elstner Associates, Inc.
- D. Sealant Testing Agency Qualifications: Qualified according to ASTM C1021 for testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect security glazing and glazing materials according to manufacturer's written instructions. Prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating security glazing and with air-gap security glazing manufacturers' written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

1.10 WARRANTY

- A. Manufacturer's Special Warranty for Glass-Clad Polycarbonate: Manufacturer agrees to replace glass-clad polycarbonate that deteriorates within specified warranty period. Deterioration of glass-clad polycarbonate is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning glass-clad polycarbonate contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glazing, blemishes exceeding those allowed by referenced glass-clad polycarbonate standard, yellowing, and loss of light transmission.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Security Glazing: Obtain security glazing from single source from single manufacturer using the same types of lites, plies, interlayers, and spacers for each security glazing type indicated.

2.2 PERFORMANCE REQUIREMENTS

- A. General:

1. Installed security glazing shall withstand security-related loads and forces without damage to the glazing beyond that allowed by referenced standards.

- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated.

2.3 SECURITY GLAZING, GENERAL

- A. Glazing Publications: Comply with published recommendations of security glazing and glazing material manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."

- B. Plastic Glazing Labeling: Identify plastic sheets with appropriate markings of applicable testing and inspecting agency, indicating compliance with required fire-test-response characteristics.

- C. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction or manufacturer. Label shall indicate

manufacturer's name, type of glazing, glass thickness, and safety glazing standard with which glazing complies.

- D. Fire-Test-Response Characteristics of Polycarbonate Sheets: As determined by testing polycarbonate sheets identical to those used in security glazing products by a qualified testing agency acceptable to authorities having jurisdiction.
1. Self-ignition temperature of 650 deg F (343 deg C) or more when tested according to ASTM D1929 on plastic sheets in thicknesses indicated for the Work.
 2. Smoke-Developed Index of 450 or less when tested according to ASTM E84, or smoke density of 75 or less when tested according to ASTM D2843 on plastic sheets in thicknesses indicated for the Work.
 3. Burning extent of 1 inch (25 mm) or less when tested according to ASTM D635 at a nominal thickness of 0.060 inch (1.52 mm) or thickness indicated for the Work.

2.4 GLASS PRODUCTS

- A. Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 2. For heat-strengthened float glass, comply with requirements for Kind HS.
 3. For fully tempered float glass, comply with requirements for Kind FT.
 4. For uncoated glass, comply with requirements for Condition A.
 5. For coated vision glass, comply with requirements for Condition C (other coated glass).

2.5 POLYCARBONATE SECURITY GLAZING

- A. Polycarbonate Sheet: ASTM C1349, Appendix X1, Type II, coated, mar-resistant, UV-stabilized polycarbonate with coating on exposed surfaces and Type I, standard, UV-stabilized polycarbonate where no surfaces are exposed.
- B. Laminated Polycarbonate: Polycarbonate sheets laminated with clear urethane interlayer that complies with ASTM C1349, Appendix X2, and has a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation. Provide laminated units that comply with requirements of ASTM C1349 for maximum allowable laminating process blemishes and haze.
- C. Glass-Clad Polycarbonate: ASTM C1349.

2.6 INSULATING SECURITY GLAZING

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Insulgard Security Products; Armor-Gard BALULN32 Glass Clad Polycarbonate Glazing, or equal.
1. UL 752 Level 5.
 2. Nominal thickness: 1.283 inches.
 3. Light transmittance: 77%.

2.7 GLAZING SEALANTS

- A. General:
1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they contact, including security glazing, seals of insulating security glazing and air-gap security glazing, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and security glazing manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: Match glazing sealant color for other glazing in hollow metal frames.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

2.8 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and security glazing manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
1. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of security glazing and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by security glazing manufacturer to maintain security glazing lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit security glazing lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.10 FABRICATION OF SECURITY GLAZING

- A. Fabricate security glazing in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Grind smooth and polish exposed security glazing edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing for security glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Minimum required bite.
 - 5. Effective sealing between joints of framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving security glazing immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of security glazing, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect edges of security glazing from damage during handling and installation. Remove damaged security glazing from Project site and legally dispose of off Project site. Damaged security glazing includes units with edge or face damage or other imperfections that, when installed, could weaken security glazing and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glazing unit manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by security glazing manufacturers for installing lites.
- F. Provide spacers for security glazing lites where the length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of security glazing. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glazing lites and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent security glazing from moving sideways in glazing channel, as recommended in writing by security glazing manufacturer and according to requirements in referenced glazing publications.
- H. Set security glazing in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set coated security glazing with proper orientation so that coatings and films face exterior or interior as specified.

- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by security glazing, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center security glazing in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between security glazing and glazing stops to maintain face clearances and to prevent sealant from extruding into glazing channel and blocking weep systems. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to security glazing and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial washaway from security glazing.

3.6 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect security glazing from contact with contaminating substances resulting from construction operations, including weld splatter. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with security glazing, remove substances immediately as recommended in writing by security glazing manufacturer. Remove and replace security glazing that cannot be cleaned without damage.
- C. Wash security glazing on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash security glazing as recommended in writing by security glazing manufacturer.

3.7 GLASS-CLAD POLYCARBONATE SECURITY GLAZING SCHEDULE

- A. Security Glazing CBG: Basis-of-Design Product: Subject to compliance with requirements, provide Insulgard Security Products; Armor-Gard BALULN32 Clear glass-clad polycarbonate.
 - 1. Ballistic Resistance: Level 5 according to UL 752.
 - 2. Overall Unit Thickness: 1.283 inches.
 - 3. Outer Ply: float glass.
 - 4. Overall Visible Light Transmittance: 77%.
 - 5. Provide safety glazing labeling.

END OF SECTION 088853

SECTION 092116.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

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 gypsum board shaft wall assemblies.

1.3 ACTION SUBMITTALS

- A. Product Data: For each component of gypsum board shaft wall assembly.

1.4 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 support them on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.
- B. Do not install finish panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, or mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy 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: Provide materials and construction identical to those of assemblies tested according to ASTM E 90 and classified according to ASTM E 413 by a testing and inspecting agency.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

- A. Fire-Resistance Rating: As indicated.
- B. STC Rating: 51, minimum.
- C. Gypsum Shaftliner Board:
 - 1. Type X: ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with paper faces, 1 inch (25.4 mm) thick, with double beveled long edges.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide American Gypsum; Shaft Liner or a comparable product by one of the following:
 - 1) CertainTeed Corporation.
 - 2) Georgia-Pacific Building Products.
 - 3) United States Gypsum Company.
- D. Non-Load-Bearing Steel Framing, General: Complying with ASTM C 645 requirements for metal unless otherwise indicated and complying with requirements for fire-resistance-rated assembly indicated.
 - 1. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized unless otherwise indicated.
- E. Studs: Manufacturer's standard CH profile for repetitive members as follows:
 - 1. Depth: As indicated.
 - 2. Minimum Base-Metal Thickness: 0.030 inch (0.75 mm).
- F. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches (51 mm) long and matching studs in depth.
 - 1. Minimum Base-Metal Thickness: Matching steel studs.

- G. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BlazeFrame Industries.
 - b. CEMCO; California Expanded Metal Products Co.
 - c. Fire Trak Corp.
 - d. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - e. Metal-Lite.
 - f. Steel Network, Inc. (The).
- H. Elevator-Hoistway-Entrance Struts: Manufacturer's standard J-profile jamb strut with long-leg length of 3 inches (76 mm), matching studs in depth, and not less than 0.033 inch (0.84 mm) thick.
- I. Finish Panels: As indicated.
- J. Sound Attenuation Blankets: As specified in Section 092900 "Gypsum Board."

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with shaft wall manufacturer's written instructions.
- B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 092900 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written instructions for application indicated.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
- D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.
 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

- E. Reinforcing: Galvanized-steel reinforcing strips with 0.033-inch (0.84-mm) minimum thickness of base metal (uncoated).
- F. Acoustical Sealant: Section 079200 " Joint Sealants."
- G. Gypsum Board Cants:
 - 1. Gypsum Board Panels: As specified in Section 092900 "Gypsum Board," Type X, 1/2- or 5/8-inch (13- or 16-mm) panels.
 - 2. Adhesive: Laminating adhesive as specified in Section 092900 "Gypsum Board."
 - 3. Non-Load-Bearing Steel Framing: As specified in Section 092216 "Non-Structural Metal Framing."

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 the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Sprayed Fire-Resistive Materials: Coordinate with gypsum board shaft wall assemblies so both elements of Work remain complete and undamaged.

3.3 INSTALLATION

- A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated and manufacturer's written installation instructions.
- B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
 - 1. Elevator Hoistway: At elevator hoistway-entrance door frames, provide jamb struts on each side of door frame.

2. Reinforcing: Provide where items attach directly to shaft wall assembly as indicated on Drawings; accurately position and secure behind at least one layer of face panel.
- D. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons and floor indicators, and similar items.
- E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.
- F. Firestop Tracks: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
- G. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.
- H. Sound-Rated Shaft Wall Assemblies: Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly.
- I. Gypsum Board Cants: At projections into shaft exceeding 4 inches (102 mm), install gypsum board cants covering tops of projections.
 1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches (610 mm) o.c. with screws fastened to shaft wall framing.
 2. Where non-load-bearing steel framing is required to support gypsum board cants, install framing at 24 inches (610 mm) o.c. and extend studs from the projection to shaft wall framing.
- J. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.4 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, or mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

LEE'S SUMMIT MIDDLE SCHOOL #4
PACKAGE 3 – BUILDING & SITE
LEE'S SUMMIT, MISSOURI

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8 OCTOBER 2020
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END OF SECTION 092116.23

GYPSON BOARD SHAFT WALL ASSEMBLIES

092116.23 - 6

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

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. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

- B. Related Requirements:

- 1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs.

1.3 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

- 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: Coating with equivalent corrosion resistance of ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized unless otherwise indicated.

- B. Studs and Runners: ASTM C 645.
 - 1. Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
 - b. Depth: 3-5/8 inches (92 mm), 4 inches, 6 inches (152 mm), 8 inches, 10 inches, 1-5/8 inches (41 mm).
- C. Slip-Type Head Joints: Where indicated, provide the following:
 - 1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (51-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
- E. Cold-Rolled Channel Bridging: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 1-1/2 inches (38 mm).
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
 - 2. Depth: 7/8 inch (22.2 mm).
- G. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 3/4 inch (19 mm).
 - 2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
 - 3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.

- C. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch (1.34 mm) and minimum 1/2-inch- (13-mm-) wide flanges.
 - 1. Depth: 1-1/2 inches (38 mm).
- D. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges, 3/4 inch (19 mm) deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
 - b. Depth: 3-5/8 inches (92 mm).
 - 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch (22 mm) deep.
 - a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
- E. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; Drywall Grid System.
 - c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide the following:
 - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
 - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

- a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
- E. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.4 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches (1219 mm) o.c.
 2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c.
 3. Furring Channels (Furring Members): 24 inches (610 mm) o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 4. Do not attach hangers to steel roof deck.
 5. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

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.
- B. Related Requirements:
 - 1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
 - 2. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

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

1.4 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.

1.5 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 splotchy 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.
- C. Low-Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying 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."

2.2 GYPSUM BOARD, GENERAL

- A. 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, provide products by the following:
 1. American Gypsum.
 2. CertainTeed Corp.
 3. Georgia-Pacific Gypsum LLC.
 4. Lafarge North America Inc.
 5. National Gypsum Company.
 6. PABCO Gypsum.
 7. Temple-Inland.
 8. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 1. Thickness: 5/8 inch (15.9 mm).
 2. Long Edges: Tapered.

- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (15.9 mm).
 - 2. Long Edges: Tapered.

- D. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces at toilet rooms and elsewhere as indicated.
 - 1. Core: 5/8 inch (15.9 mm), Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 SPECIALTY GYPSUM BOARD

- A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. American Gypsum; Firebloc Type C.
 - b. CertainTeed Corp.; ProRoc Type C.
 - c. Georgia-Pacific Gypsum LLC; Fireguard C.
 - d. Lafarge North America Inc.; Firecheck Type C.
 - e. National Gypsum Company; Gold Bond Fire-Shield C.
 - f. PABCO Gypsum; Flame Curb Type Super C.
 - g. Temple-Inland; Type TG-C.
 - h. USG Corporation; Firecode C Core.
 - 2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
 - 3. Long Edges: Tapered.

2.5 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corp.; GlasRoc Tile Backer.
 - b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
 - 2. Core: As indicated on Drawings, Type X.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized steel sheet, plastic, or rolled zinc.
2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.7 JOINT TREATMENT MATERIALS

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

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
3. 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.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
- D. Joint Compound for Tile Backing Panels:
1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
 2. Cementitious Backer Units: As recommended by backer unit manufacturer.
 3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.8 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 have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 2. 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 (0.84 to 2.84 mm) 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 10 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, provide one of the following:
 - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
 - b. Pecora Corporation; AC-20 FTR.
 - c. Specified Technologies, Inc.; Smoke N Sound Acoustical Sealant.
 - d. USG Corporation; SHEETROCK Acoustical Sealant.
 2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 3. 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 Section 072100 "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.

3.2 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 (1.5 mm) 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. (0.7 sq. m) 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- (6.4- to 9.5-mm-) 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- (6.4- to 12.7-mm-) 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. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- J. 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.
- K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: As indicated on Drawings.
 - 2. Ceiling Type: Ceiling surfaces.
 - 3. Glass-Mat Backing Boards: Toilet Room walls and other walls with plumbing fixtures, receiving tile finishes, or as indicated on Drawings.

4. Wallboard Type: As indicated on Drawings.
5. Ceiling Type: As indicated on Drawings.
6. Abuse-Resistant Type, Level 2: Up to 8 feet high in Corridors, Vestibules, Stairways, or where indicated on Drawings.
7. Moisture- and Mold-Resistant Type: Toilet Room walls and other walls with plumbing fixtures, not receiving tile finishes, interior sides of exterior walls, not indicated for abuse-resistant types, or 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. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. 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 (400 mm) 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. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. 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.

3.4 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 at locations indicated on Drawings and 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.
 - 2. Bullnose Bead: Use where indicated.
 - 3. LC-Bead: Use at exposed panel edges.
 - 4. L-Bead: Use where indicated.
 - 5. U-Bead: Use where indicated.
- D. Aluminum Trim: Install in locations indicated on Drawings.

3.5 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 2: Panels that are substrate for tile.
 - 3. Level 4 is suitable for surfaces receiving light-textured finishes, wallcoverings, and satin paints. It is generally the standard exposed finish. Gloss and semigloss enamel paints are not usually recommended over this level of finish. ASTM C 840 requires application of "drywall primer" on surfaces before final decoration. Specify priming of gypsum board surfaces in Section 099123 "Interior Painting."
 - 4. Level 5 is required for surfaces receiving gloss enamel paints, or where indicated in drawings. ASTM C 840 requires application of "drywall primer surfacer" and skim coat of compound on surfaces before final decoration. Specify priming of gypsum board surfaces in Section 099123 "Interior Painting."
- E. Glass-Mat, Water-Resistant Backing Board: Finish according to manufacturer's written instructions.

3.6 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 092900

SECTION 093013 - CERAMIC 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. Glazed wall tile.
- 2. Colorbody Porcelain Tile

- B. Related Requirements:

- 1. Section 079200 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
- 2. Section 099123 "Interior Painting" for color match.
- 3. Section 092900 "Gypsum Board" for cementitious backer units.

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 its "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 ACTION SUBMITTALS

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

- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For tile, grout, and accessories involving color selection.
- D. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of product.
- C. Product Test Reports: For tile-setting and -grouting products.

1.6 MAINTENANCE MATERIAL 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 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer is a five-star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
 - 2. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

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.

1.9 FIELD 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 and color or finish 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.

2.2 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 TCNA 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.

2.3 TILE PRODUCTS

A. Ceramic Tile Type (T-01 and T-05): Colorbody Porcelain Mosaic Tile.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Trinity Tile; Trinity Stardust or equal product by one of the following:
 - a. American Olean.
 - b. Crossville.
 - c. Daltile.
2. Colors: As indicated on the Finish Schedule.
3. Sheet Size: 12 by 24 inches.
4. Thickness: 1/4 inch.
5. Installation Method: As shown on Drawings.
6. Dynamic Coefficient of Friction: Not less than 0.42.
7. Grout Color: As selected by Architect from manufacturer's full range.
8. Trim Units:
 - a. External Corners: Provide Schluter®-JOLLY trim profile, satin nickel anodized finish.
 - b. Internal Corners: Field-buttet square corners.
 - c. Exposed Top Edge: Provide Schluter®-JOLLY trim profile, satin nickel anodized finish.

B. Ceramic Tile Type (T-02, T-03, T-04, T-06, T-07): Glazed Ceramic Tile.

1. Products Subject to compliance with requirements, provide the following:
 - a. Maniscalco Kaleidoscope; distributed by Jaeckle Distributors.
2. Colors: As indicated on Finish Schedule
3. Sheet Size: 3 by 6 inches.
4. Thickness: 5/16 inch.
5. Installation Method: As shown on Drawings.
6. Dynamic Coefficient of Friction: Not less than 0.42.
7. Grout Color: As selected by Architect from manufacturer's full range.
8. Trim Units:
 - a. External Corners: Provide Schluter®-JOLLY trim profile, satin nickel anodized finish.
 - b. Internal Corners: Field-buttet square corners.

2.4 SETTING MATERIALS

A. Modified Dry-Set Mortar (Thinset): ANSI A118.4.

1. Mortar for all Wall Tile:

a. Product: Subject to compliance with requirements, provide the following:

1) TEC/H.B. Fuller Construction Products Inc.; Sturdi Flex Thin Set Mortar.

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.

2.5 GROUT MATERIALS

A. High-Performance Tile Grout: ANSI A118.7.

1. Product: Subject to compliance with requirements, provide the following:

a. TEC/H.B. Fuller Construction Products Inc.; TEC Power Grout.

2. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.

2.6 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. 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.

2.7 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 the Work.
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 thinset 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.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. 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.

3.3 CERAMIC TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA 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 TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

- B. 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.
- C. 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.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Jointing Pattern: 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. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 2. 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.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. Wall Tile: 1/8 inch.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout 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.

3.5 PROTECTION

- A. 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.

- B. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.6 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Interior Wall Installations, Metal Studs or Furring:

- 1. Ceramic Tile Installation: TCNA W245 or TCNA W248; thinset mortar on glass-mat, water-resistant gypsum backer board.
 - a. Thinset Mortar: Modified dry-set mortar.
 - b. Grout: High-performance unsanded grout.

- B. Interior Wall Installations; Masonry or Concrete

- 1. Ceramic Tile Installation: TCNA W202; thinset mortar.
 - a. Thinset Mortar: Modified dry-set mortar.
 - b. Grout: High-performance unsanded grout.

END OF SECTION 093013

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

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. This Section includes acoustical panels and exposed suspension systems for ceilings.

1.3 DEFINITIONS

- A. AC: Articulation Class.
- B. CAC: Ceiling Attenuation Class.
- C. LR: Light Reflectance coefficient.
- D. NRC: Noise Reduction Coefficient.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6-inch- (150-mm-) square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- (300-mm-) long Samples of each type, finish, and color.
- D. Maintenance Data: For finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.8 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies. Coordinate delivery address and quantities two months in advance of project completion

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Acoustical Ceiling Panels: Provide three unopened carton standard panels and one unopened carton of specialty panels, or 1% of panels for each style, whichever is greater.
 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.
- B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
- C. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.3 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING (ACP-1)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Interiors, Inc.; Subsidiary of USG Corporation, Astro Climaplus Square Lay-In 8221, or comparable product by one of the following:
1. Armstrong World Industries, Inc.
 2. CertainTeed Corporation.
- B. Color: White.
- C. LR: Not less than 0.86.
- D. NRC: Not less than 0.55.
- E. Edge/Joint Detail: Square.
- F. Thickness: 5/8 inch (16 mm).

- G. Modular Size: 24 by 24 inches (610 by 610 mm).
- H. Antimicrobial Treatment: Broad spectrum antimicrobial additive to prevent growth of mold and mildew. Includes sag resistance performance.

2.4 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING (ACP-2)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Interiors, Inc.; Subsidiary of USG Corporation, Astro Climaplus Square Lay-In 8241, or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. CertainTeed Corporation.
- B. Color: White.
- C. LR: Not less than 0.86.
- D. NRC: Not less than 0.55.
- E. Edge/Joint Detail: Square.
- F. Thickness: 5/8inch (16 mm).
- G. Modular Size: 24 by 48 inches (610 by 1220 mm).
- H. Antimicrobial Treatment: Broad spectrum antimicrobial additive to prevent growth of mold and mildew. Includes sag resistance performance.

2.5 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING (ACP-3)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Interiors, Inc.; Subsidiary of USG Corporation., Sheetrock Brand Lay-in Gypsum Ceiling Panels, or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc Corporation.
 - 2. CertainTeed Corporation.
- B. Color: White.
- C. LR: Not less than 0.77.
- D. NRC: NA.
- E. Edge/Joint Detail: Square.
- F. Thickness: 1/2 inch (13 mm).

- G. Modular Size: 24 by 48 inches (610 by 1220 mm).
- H. Panel Features: Washable, scrubbable, soil and impact resistant finish. Meets USDA/FSIS guidelines for use in food processing area.
- I. Antimicrobial Treatment: ClimaPlus™ 30-year limited system warranty: Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.

2.6 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING (ACP-4)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Interiors, Inc.; Subsidiary of USG Corporation., Mars High NRC 85/35 Acoustical Ceiling Panels, or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc Corporation.
 - 2. CertainTeed Corporation.
- B. Color: White.
- C. LR: Not less than 0.90.
- D. NRC: .85.
- E. CAC: .35
- F. Edge/Joint Detail: Square.
- G. Thickness: 7/8 inch (22 mm).
- H. Modular Size: 24 by 24 inches (610 by 610 mm).
- I. Antimicrobial Treatment: ClimaPlus™ 30-year limited system warranty: Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.

2.7 ACOUSTICAL BAFFLES (ACP-5)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide MBI Products Company, Cloud-Lite Baffles or comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. United States Gypsum Company.
- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 84 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

- C. Classification: Provide panels as follows:
 - 1. Substrate: 6# fiberglass core
- D. Facing Material: Sailcloth Nylon. Light to Medium Grey Color to be selected by Architect from manufacturer's standard colors. Color of fiberglass core should not bleed through to alter color of sailcloth.
- E. Thickness: 2 inches.
- F. Edge Detail: Square
- G. Edge Construction: Sewn
- H. Modular Size and Shape: As indicated on drawings.
- I. NRC: 1.35
- J. Mounting; Grommets shall be installed to facilitate mounting on either the short or long edge of the baffle, as indicated on the drawings.
- K. Installation: Manufacturer's standard recommended cable attachment system.

2.8 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
 - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Postinstalled expansion anchors.
 - b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
3. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.135-inch- (3.5-mm-) diameter wire.
4. Aircraft Cable: 1/32 inch with crimped connectors.

2.9 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING (ACP-1, ACP-2, ACP-4)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Interiors; 15/16-inch Donn DXL, or comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. Chicago Metallic.
3. CertainTeed.

- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation, with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Override (stepped) type.
3. Face Design: Flat, flush.
4. Cap Material: Steel cold-rolled sheet.
5. Cap Finish: Painted white.

2.10 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILING (ACP-3)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide USG Interiors; 15/16-inch Donn ZXLA, or comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. CertainTeed.
3. Chicago Metallic.

- B. Double-web Design; Heavy Duty as defined by ASTM C635. Bottom face with; 15/16-inch (24mm) exposed flange with pre-painted aluminum cap; cross tee holes and hanger wire holes at 6 in oc; integral reversible splices, commercial quality pretreated and painted, exposed surfaces prefinished in manufacturer's enhanced corrosion resistant polyester paint finish. Cross tees; roll-formed into double-web design with rectangular bulb; 15/16 (24mm) in exposed flange with pre-painted aluminum cap; Stainless Steel clips clenched to the web main tees and cross tees shall be positively locked, yet shall be removable without the use of tools.

- C. Structural Classification: Heavy-duty system.

- D. Cap Finish: Painted white.

2.11 METAL EDGE MOLDINGS AND TRIM

- A. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products by USG Interiors or one of the following:
1. Armstrong World Industries, Inc.
 2. CertainTeed.
 3. Chicago Metallic.
- B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners, unless otherwise indicated.
 2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- C. Metal Suspension System Edge Trim for Acoustical Panel Ceiling, Perimeter Trim:
1. Product: Subject to compliance with requirements, provide Compasso Trim, 2-inch system, or approved equal.
 - a. Trim: 2-inch high; 9/16-inch face flanges with hems formed for attachment to mounting clip; commercial quality cold-rolled steel factory finished in baked enamel paint finish in color white.
 - b. Splice Plate: Steel in finish to match trim pans; formed for snap-fit into 2-inch pan ends.
 - c. Attachment Clips: Hot-dipped galvanized steel in finish to match pans formed to snap-fit into 2-inch pan and attached to suspension system members.
 - d. 90-Degree Corner Trim Pieces: To match trim.
 2. Suspension System Attachment Devices:
 - a. Hanger Wire: Galvanized carbon steel; soft temper; pre-stretched; yield stress load at least three times the design load but not less than 12-gauge.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 - 6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

7. Do not attach hangers to steel deck tabs.
 8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 11. Attach main runners and cross tees to edge angles with white pop rivets.
 12. Do not install acoustical panels until the building is enclosed, the permanent heating/cooling equipment is in operation and residual moisture from construction has dissipated.
- C. Do not install acoustical panels until the building is enclosed, the permanent heating /cooling equipment is in operation and residual moisture from construction has dissipated.
- D. Label ceiling grid for mechanical equipment with corresponding equipment designation from mechanical drawings. Coordinate with Mechanical Engineer (laminated or plastic label).
- E. Coordinate installation of grid and panels with all trades requiring access to plenum spaces and avoid installation of panels in areas until above ceiling access is complete.
- F. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- G. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- H. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- I. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
 2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 095425 - LINEAR WOOD CEILINGS

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 strip, linear wood grilles, and suspension systems for ceilings.

1.3 DEFINITIONS

- A. LR: Light Reflectance coefficient.
- B. NRC: Noise Reduction Coefficient.

1.4 COORDINATION

- A. Coordinate layout and installation of linear metal pans and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below:
 - 1. Linear Wood Grilles: Set of 12-inch- (300-mm-) long Samples of each type and color and a 12-inch- (300-mm-) long spliced section.
 - 2. Suspension System Members: 12-inch- (300-mm-) long Sample of each type.
 - 3. Exposed Molding and Trim: Set of 12-inch- (300-mm-) long Samples of each type, finish, and color.
 - 4. Filler Strips: Set of 12-inch- (300-mm-) long Samples of each type, finish, and color.

5. Sound Absorber: 12 inches (300 mm) long.
6. End Cap: Full size.

1.7 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 1. Linear pattern.
 2. Joint pattern.
 3. Ceiling suspension members.
 4. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 5. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
 6. Ceiling perimeter and penetrations through ceiling; trim and moldings.
 7. Minimum Drawing Scale: 1/4 inch = 1 foot (1:48).
- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each linear metal ceiling, for tests performed by a qualified testing agency.
- D. Evaluation Reports: For linear metal ceiling and components and anchor and fastener type.
- E. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

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

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Linear Wood Ceiling Components: Quantity of each pan, carrier, accessory, and exposed molding and trim equal to 2 percent of quantity installed.

1.10 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Accredited by National Voluntary Laboratory Accreditation Program for testing indicated.

- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
 - 1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver linear metal pans, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they are protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Handle linear metal pans, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.

1.12 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install linear metal ceilings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Exterior linear metal ceilings shall withstand the effects of gravity loads and the following loads and stresses without showing permanent deformation of ceiling system components including pans and suspension system; noise or metal fatigue caused by vibration, deflection, and displacement of ceiling pans; or permanent damage to fasteners and anchors:
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - 2. Smoke-Developed Index: 450 or less.

2.2 LINEAR WOOD CEILING GRILLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Rulon International Inc.
 2. Ceilings Plus, USG
- B. Provide manufacturer's standard linear wood planks of configuration indicated that comply with ASTM E 1264 classifications as designated by types, acoustical ratings, and light reflectance's unless otherwise indicated.
1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.
- C. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong; WOODWORKS Grilles:
1. COMMONS D101: Three-Slat; 1-1/4-inch-wide by 5-1/4 inch high; with 2-3/4-inch open area between slats; #7099, Backer and Dowel. No Infill Panel.
 2. MEDIA CENTER D103, CORRIDOR B20, AND CORRIDOR C20: Six-Slat; 5/8-inch wide by 2-1/4-inches inch high; backer 15/16 inch; BioAcoustic Infill Panel Black.
- D. Fabrication: Manufacturer's standard units of size, profile, and edge treatment indicated, formed from metal indicated to snap on and be securely retained on carriers without separate fasteners, and finished to comply with requirements indicated.
- E. Splices: Construction same as pans, in lengths 8 to 12 inches (200 to 300 mm); with manufacturer's standard finish.
- F. Moldings and Trim: Provide manufacturer's standard moldings and trim for exposed members, and as indicated or required, for edges and penetrations of ceiling, around fixtures, at changes in ceiling height, and for other conditions; of same metal and finish as linear metal ceiling pans.
- G. Sound-Absorbent Fabric Layer: Provide fabric layer, sized to fit concealed surface of pan, and consisting of black, nonwoven, nonflammable, sound-absorbent material with surface-burning characteristics for flame-spread index of 25 or less and smoke-developed index of 50 or less, as determined by testing per ASTM E 84.
1. Bond fabric layer to pan in the factory with manufacturer's standard nonflammable adhesive.

2.3 METAL SUSPENSION SYSTEMS

- A. Metal Suspension Systems Standard: Provide ceiling manufacturer's standard metal suspension systems of types and finishes indicated that comply with applicable ASTM C 635/C 635M requirements.
- B. Suspension Systems: Provide systems complete with carriers, splice sections, connector clips, alignment clips, leveling clips, hangers, molding, trim, retention clips, load-resisting struts, fixture adapters, and other suspension components required to support ceiling units and other ceiling-supported construction.

- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, Direct Hung, unless otherwise indicated.
1. Cast-in-Place and Postinstalled Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Postinstalled expansion anchors.
 - b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC service condition (mild).
 - c. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchors.
 - d. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.
 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- D. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:
1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 2. Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
 3. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
 4. Size: Select wire diameter so its stress at 3 times the hanger design load indicated in ASTM C 635/C 635M, Table 1, Direct Hung is less than yield stress of wire, but provide not less than 0.135-inch- (3.5-mm-) diameter wire.
 5. At MEDIA CENTER D103: Provide aircraft cable where visible.
- E. Carriers: Factory finished with matte-black baked finish.
1. Main Carriers: Aluminum, not less than 0.240-inch (6.0-mm) rolled sheet, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, complying with ASTM B 209 (ASTM B 209M).
 2. Main Carriers: Steel, not less than 0.0209-inch (0.53-mm) nominal thickness, cold-rolled sheet, with factory-applied protective coating, complying with ASTM C 635/C 635M.
 - a. Hot-Dip Galvanized Steel: ASTM A 653/A 653M, not less than G60 (Z180) zinc coating.
 3. Adaptable Carriers: Manufacturer's standard carriers for direct attachment to existing suspended tees.
 4. Flexible Radial Carriers: Manufacturer's standard radial carriers.

5. Expansion Carriers: Manufacturer's standard carriers allowing for irregularities or other unusual space conditions.
- F. Carrier Splices: Same metal, profile, and finish as for carriers.
- G. Stabilizer Channels, Tees, and Bars: Manufacturer's standard components for stabilizing main carriers at regular intervals and at light fixtures, air-distribution equipment, access doors, and other equipment; spaced as standard with manufacturer for use indicated; and factory finished with matte-black baked finish.
- H. Edge Moldings and Trim: Provide exposed members as indicated or required to comply with seismic requirements of authorities having jurisdiction, to conceal edges of penetrations through ceiling, to conceal ends of pans and carriers, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching linear metal pans or extruded plastic unless otherwise indicated.
 1. For Circular Penetrations of Ceiling: Fabricate edge moldings to diameter required to fit penetration exactly.
 2. Edge Trim:
 - a. Product: Subject to compliance with requirements, provide Woodworks Veneer Trim; #5419W1; finished to match grilles.
 - 1) Commons: 6 inches high.
 - 2) Media Center and Corridors: 4 inches high.

2.4 ACCESSORIES

- A. Access Panels: For access at locations indicated, provide door hinge assembly, retainer clip, and retainer bar, assembled with ceiling panels and carrier sections into access doors of required size, permitting upward or downward opening.

2.5 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. 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.
- C. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which linear metal ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of linear metal ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of linear metal pans to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width pans at borders, and comply with layout shown on reflected ceiling plans and on Coordination Drawings.

3.3 INSTALLATION

- A. Comply with ASTM C 636/C 636M and seismic requirement indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate to which hangers are attached and for type of hanger involved.
 - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that does not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 - 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.

7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers but without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of linear metal ceiling area and where necessary to conceal edges and ends of linear metal pans.
1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system carriers so they are aligned and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Cut linear metal pans for accurate fit at borders and at interruptions and penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.
- G. Install linear metal pans in coordination with suspension system and exposed moldings and trim.
1. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions unless otherwise indicated.
 2. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.
 3. Install pans with butt joints using internal pan splices and in the following joint configuration:
 - a. Aligned.
 - b. Aligned, every other pan length.
 - c. Staggered a minimum of 12 inches (300 mm).
 - d. Random.
 - e. As indicated.
 4. Install directionally textured metal pans in directions indicated.
 5. Where metal pan ends are visible, install end caps unless trim is indicated.

6. Install filler strips where indicated.
7. Install sound-absorbent pads at right angle to perforated metal pans so pads do not hang unsupported.

H. Install hold-down clips where indicated.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:

1. Suspended ceiling system.
2. Hangers, anchors, and fasteners.

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

C. Tests and Inspections: Testing and inspecting of completed installations of linear metal ceiling hangers and anchors and fasteners shall take place in successive stages, in areas of extent and using methods as follows. Do not proceed with installations of linear metal ceiling hangers for the next area until test results for previously completed installations show compliance with requirements.

1. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed.
 - a. Within each test area, testing agency will select 1 of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf (890 N) of tension; it will also select 1 of every 2 postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.
 - b. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

D. Linear wood ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 CLEANING

A. Clean exposed surfaces of linear metal ceilings, including trim and edge moldings after removing strippable, temporary protective covering if any. Comply with manufacturer's written instructions for stripping of temporary protective covering, cleaning, and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.

LEE'S SUMMIT MIDDLE SCHOOL #4
PACKAGE 3 – BUILDING & SITE
LEE'S SUMMIT, MISSOURI

13-20102-00
8 OCTOBER 2020
PERMIT SET

END OF SECTION 095423

LINEAR WOOD CEILINGS

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SECTION 096400 - WOOD STAGE FLOORING

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. Field-finished wood flooring at Platform area.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 096466 "Wood Athletic Flooring" for wood resilient systems used in sports activity areas.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of floor assembly and accessory. Include plans, sections, and attachment details. Include expansion provisions and trim details.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood flooring materials in unopened cartons or bundles.
- B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
- C. Store wood flooring materials in a dry, warm, ventilated, weathertight location.

1.5 FIELD CONDITIONS

- A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.

1. Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F (18 and 24 deg C) and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
 2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
 - a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
 - b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Softwood Flooring: Comply with WCLIB No. 17 grading rules for species, grade, and cut.

2.2 FIELD-FINISHED WOOD FLOORING (WD-03)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Robbins, Inc.; Air Channel Classic Installation - Stage Floor, or comparable product by one of the following:
1. Aacer Flooring, LLC.
 2. Action Floor Systems LLC.
 3. Horner Flooring Company, Inc.
- B. Grade and Species: Southern yellow pine, B & B flooring.
- C. Cut: Flat grain.
- D. Size: Nominal 1 by 4.
- E. Lengths: Random-length strips complying with applicable grading rules and not less than 24-inches in length.
- F. Wood Sleepers: 2 x 4 pine, and as specified in Section 061000 "Rough Carpentry"
- G. Subfloor: 15/32-inch thick APA rated CD exterior-glued plywood.
- H. Paint System:
1. Paint: PoloPlaz Safety Black water-based topcoat, or equal.
- I. Floor Sealer:

1. Floor sealer: PoloPlaz NSB Waterborne Sealer, or equal.
- J. Wood Filler: Compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved Samples, provide pigmented filler.

2.3 ACCESSORY MATERIALS

- A. Vapor Retarder: 0.006 mil polyethylene.
- B. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines."
- C. Rubber vented coved base.
- D. Thresholds: Provide mill-finished aluminum threshold saddles at wood flooring transitions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Concrete Slabs:
 1. Grind high spots and fill low spots to produce a maximum 1/8-inch (3-mm) deviation in any direction when checked with a 10-foot (3-m) straight edge.
 2. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- B. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines."

- B. Install vapor retarder to entire concrete floor surface to receive wood flooring. Provide 6-inch laps.
- C. Install sleepers end-to-end at right angles to finished flooring. Sleepers shall be staggered 3', 5', 8', with rows spaced 16-1/16 inches on center with plywood.
- D. Install plywood subflooring with the 8' dimension parallel to the sleepers void at walls and other permanent vertical obstructions. Install staggering panels in adjacent rows. Fasten plywood subfloor to sleepers using 1-1/4-inch staples placed 8 to 10 inches on center along each sleeper. Begin installation of plywood by cutting alternate sheets along the beginning wall line to assure proper breaking of end joint seams of the plywood subfloor.
- E. Flooring installation: Install a starter row along the centerline of flooring area. The starter row must be a double-tongued starter board, or standard milled board using a spline or "slip-tongue", to provide the double-tongue effect. The starter row must be nailed with barbed cleats in both directions to prevent tipping. Care shall be taken to avoid damaging the face or surface edge of the flooring boards. Tap into position from both the tongue side and the exposed end.
- F. Provide expansion space at walls and other obstructions and terminations of flooring of 2 inches (50 mm).

3.4 FIELD FINISHING

- A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that are noticeable after finishing. Buff entire floor using a 100-grit screenback or equal grit sandpaper, with a heavy-duty buffing machine. Vacuum and tack with a clean cloth immediately before applying finish.
 - 1. Comply with applicable recommendations in NWFA's "Installation Guidelines."
- B. Fill and repair wood flooring defects.
- C. Apply two coats of sealer to entire flooring area.
- D. Screenback and vacuum or tack between each coat after it dries.
- E. Apply two coats of paint to entire flooring area.
 - 1. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.
- F. Cover wood flooring before finishing.
- G. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.
- H. Install rubber vented coved base to walls adjacent to wood flooring.

- I. Install extruded aluminum expansion void cover to the perimeter or flooring. Anchor plates to concrete slab – not to the wood flooring.

3.5 PROTECTION

- A. Protect installed wood flooring during remainder of construction period with covering of heavy Kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.
 1. Do not move heavy and sharp objects directly over Kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 096400

SECTION 096410 – FACTORY-FINISHED WOOD FLOORING

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. Factory-finished wood flooring used on vertical surfaces and noted as “WOOD PANEL WD-01” on the Drawings.

- B. Related Requirements:

- 1. Section 096400 “Wood Stage Flooring” for wood flooring in Platform area.
 - 2. Section 096466 "Wood Athletic Flooring" for wood resilient systems used in sports-activity areas.

1.3 ACTION SUBMITTALS

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

- B. Shop Drawings: For each type of floor assembly and accessory. Include plans, sections, and attachment details. Include expansion provisions and trim details.

- C. Samples: For each exposed product and for each color and texture specified, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Wood Flooring: Equal to 3 percent of amount installed for each type, color, and finish of wood flooring indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood flooring materials in unopened cartons or bundles.
- B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
- C. Store wood flooring materials in a dry, warm, ventilated, weathertight location.

1.6 FIELD CONDITIONS

- A. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.
 - 1. Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F (18 and 24 deg C) and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.
 - 2. Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.
 - a. Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.
 - b. Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.
- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- C. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Verify flooring products comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Composite Wood Products: Verify products are made using ultra-low-emitting formaldehyde resins, as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products," or are made with no added formaldehyde.
- C. Hardwood Flooring: Comply with NWFA A500 for species, grade, and cut.

FACTORY-FINISHED WOOD FLOORING

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1. Certification: Provide flooring that carries NWFA grade stamp on each bundle or piece.

2.2 FACTORY-FINISHED WOOD FLOORING

- A. Engineered-Wood Flooring: HPVA EF, complying with requirements for composite wood products.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Nydree Flooring; Ombre Wide Plank or a comparable product by one of the following:

- a. Armstrong World Industries, Inc.
- b. Johnsonite; a Tarkett company.
- c. Mannington Mills, Inc.
- d. Oregon Lumber Company.
- e. Wood Flooring International.

2. Species: Walnut.
3. Thickness: 7/16 inch
4. Construction: Five ply.
5. Face Width: 5-1/4 inches
6. Length: Manufacturer's standard.
7. Edge Style: Square.
8. Finish: UV urethane.

- a. Color: As selected by Architect in manufacturer's full range.

2.3 ACCESSORY MATERIALS

- A. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate flatness, installation tolerances, and other conditions affecting performance of wood flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines."
- B. Plywood substrate: Install according to requirements in Section 061600 "Sheathing."
- C. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch (19 mm).
- D. Engineered-Wood Flooring: Nail or staple.

3.3 FIELD FINISHING

- A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that are noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
 - 1. Comply with applicable recommendations in NWFA's "Installation Guidelines."
- B. Fill and repair wood flooring defects.
- C. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.
 - 1. Apply stains to achieve an even color distribution matching approved Samples.
 - 2. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.
- D. Cover wood flooring before finishing.
- E. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.

3.4 PROTECTION

- A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.

END OF SECTION 096410

SECTION 096466 - WOOD ATHLETIC FLOORING

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. This Section includes wood athletic flooring.
- B. Related Sections include the following:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood substrates.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wood sports-floor assemblies.
- B. Shop Drawings: Show installation details including location and layout of each type of floor assembly and accessory. Include the following:
 - 1. Expansion provisions and trim details.
 - 2. Layout, colors, widths, and dimensions of game lines and markers.
 - 3. Locations of floor inserts for athletic equipment installed through flooring assembly.
- C. Samples for Initial Selection: Manufacturer's color charts showing colors and glosses available for the following:
 - 1. Floor finish.
 - 2. Game-line and marker paint.
- D. Samples for Verification: For each type of sports-floor assembly and accessory required; approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work.
 - 1. Include sample sets showing the full range of normal color and texture variations expected in wood flooring.
 - 2. Include sample sets showing finishes and game-line paint and marker paint colors applied to wood flooring.

- E. Maintenance Data: For wood sports-floor assemblies and finish systems to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed wood sports-floor assembly installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in installations with a record of successful in-service performance.
 - 1. Installer responsibilities include installation and field finishing of sports-floor assembly components and accessories, and application of game lines and markers.
- B. Maple Flooring: Comply with MFMA grading rules for species, grade, and cut.
 - 1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.
- C. Performance Testing: Flooring system shall have been tested and certified to meet or exceed athletic performance according to the International Standard DIN 18032, Part 2, 1991.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver assembly materials in unopened cartons or bundles.
- B. Protect wood from exposure to moisture. Do not deliver wood components until after concrete, masonry, plaster, ceramic tile, and similar wet work is complete and dry.
- C. Store wood components in a dry, warm, well-ventilated, weathertight location and in a horizontal position.

1.6 PROJECT CONDITIONS

- A. Conditioning period begins not less than seven days before sports-floor assembly installation, is continuous through installation, and continues not less than seven days after sports-floor installation.
 - 1. Environmental Conditioning: Maintain an ambient temperature between 65 and 75 deg F (18 and 24 deg C) and relative humidity planned for building occupants, but not less than 35 percent or more than 50 percent, in spaces to receive sports-floor assemblies during the conditioning period.
 - 2. Wood Conditioning: Move wood components into spaces where they will be installed, no later than beginning of the conditioning period.
 - a. Do not install sports-floor assemblies until wood components adjust to relative humidity of, and are at same temperature as, spaces where they are to be installed.
 - b. Open sealed packages to allow wood components to acclimatize immediately on moving wood components into spaces in which they will be installed.

- B. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
- C. Install sports-floor assemblies after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Connor Sports Flooring; Anchored Rezill-Sleeper DIN, or a comparable product by one of the following:
 - 1. Aacer Flooring, LLC.
 - 2. Action Floor Systems LLC.
 - 3. Horner Flooring Company, Inc.
 - 4. Robbins, Inc.

2.2 WOOD FLOORING WD-02

- A. Strip Flooring: Northern hard maple (*Acer saccharum*), kiln dried, random length, tongue and groove, and end matched.
 - 1. Grade: MFMA-RL Second and Better.
 - 2. Cut: Flat.
 - 3. Thickness: 25/32 inch (20 mm).
 - 4. Face Width: 2-1/4 inches (57 mm).
 - 5. Backs: Channeled (kerfed) for stress relief.

2.3 SUBFLOOR SYSTEM

- A. Plywood Underlayment: APA rated, C-D Plugged, exterior glue, tongue and groove, 15/32 inch (12 mm) thick, Exposure 1.
- B. Resilient Pads: With air voids for resiliency and installed at manufacturer's standard spacing for product designation indicated above.
 - 1. Type: Manufacturer's standard.
 - 2. Material: Manufacturer's standard.
 - 3. Thickness: 7/16 inch (11 mm).
- C. Wood Sleepers:
 - 1. Plywood, spruce, fir, pine, or hemlock; with anchoring pockets.

- D. Provide additional blocking support for telescoping bleacher wheel loads and locations.

2.4 ACCESSORIES

- A. Vapor Retarder: ASTM D 4397, polyethylene sheet not less than 6 mils (0.15 mm) thick.
- B. Resilient Wall Base: Molded, vented, rubber or vinyl cove base; 4 by 3 by 48 inches (100 by 75 by 1200 mm); with premolded outside corners.
 - 1. Color: As selected by the Architect from manufacturer's full range of colors.
- C. Expansion Space Saddles: Surface-mounted, mill-finished extruded aluminum type saddles for floor-to-floor applications bridging up to 2-wide expansion spaces around wood flooring.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Balco, Inc.; Model GF-2S, or comparable product.
- D. Fasteners: Type and size recommended by manufacturer, but not less than those recommended by MFMA for application indicated.
- E. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by sports-floor manufacturer.
- F. Adhesives: Manufacturer's standard for application indicated.
 - 1. Concrete Primers: Manufacturer's standard for application indicated.
- G. Floor-Finish System: System of compatible components recommended in writing by flooring manufacturer and MFMA approved.
 - 1. Type: MFMA Group 3, Gymnasium Type (Surface) Finishes; urethane-oil type.
 - 2. Floor-Sealer Formulation: Pliable, penetrating type.
 - 3. Finish-Coat Formulation: Formulated for gloss finish and multicoat application.
 - 4. Game-Line and Marker Paint: Industrial enamel compatible with finish coats and recommended in writing by manufacturers of finish coats, and paint for this use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of sports-floor assemblies.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

- B. Concrete Slabs: Verify that concrete slabs comply with requirements specified in Section 033000 "Cast-In-Place Concrete."
1. Moisture Testing:
 - a. Perform anhydrous calcium chloride test per ASTM F 1869, as follows:
 - 1) Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m) and perform not less than 2 tests in each installation area and with test areas evenly spaced in installation areas.
 - 2) 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.
 - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

- A. Grind high spots and fill low spots on concrete substrates to produce a maximum 1/8-inch (3-mm) deviation in any direction when checked with a 10-foot (3-m) straight edge.
1. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.
- B. Remove coatings including curing compounds and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone; use mechanical methods recommended by manufacturer. Do not use solvents.
- C. Broom and vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. General: Comply with sports-floor assembly manufacturer's written instructions, but not less than written recommendations of MFMA applicable to flooring type indicated.
- B. Pattern: Lay flooring parallel with long dimension of space to be floored, unless otherwise indicated.
- C. Expansion Spaces: Provide as indicated, but not less than that required by manufacturer's written instructions and MFMA's written recommendations at walls and other obstructions, and at interruptions and terminations of flooring.
1. Cover expansion spaces with base molding, trim, and saddles, as indicated on Drawings.

- D. Vapor Retarder: Install with joints lapped a minimum of 6 inches (150 mm) and sealed.
- E. Secure sleepers to concrete per manufacturer's recommendations.
- F. Underlayment: Install perpendicular to direction of flooring, staggering end joints in adjacent rows.
- G. Strip Flooring: Mechanically fasten perpendicular to supports.
- H. Installation Tolerances: 1/8 inch in 10 feet (3 mm in 3 m) of variance from level.

3.4 SANDING AND FINISHING

- A. Follow applicable recommendations in MFMA's "Industry Recommendations for Sanding, Sealing, Court Lining, Finishing, and Resurfacing of Maple Gym Floors."
- B. Allow installed flooring to acclimate to ambient conditions for at least 10 days before sanding.
- C. Machine sand with coarse, medium, and fine grades of sandpaper to achieve a level, smooth, uniform surface without ridges or cups. Remove sanding dust by tack or vacuum.
- D. Finish: Apply seal and finish coats of finish system according to finish manufacturer's written instructions. Provide not less than four coats total and not less than two finish coats.
 - 1. Water-Based Finishes: Use finishing methods recommended by finish manufacturer to reduce grain raise and sidebonding effect.
 - 2. Game Lines and Markers: Apply game-line and marker paint between final seal coat and first finish coat according to paint manufacturer's written instructions.
 - a. Mask flooring at game lines and markers, and apply paint to produce lines and markers with sharp edges.
 - b. Where game lines cross, break minor game line at intersection; do not overlap lines.
 - c. Apply game lines and markers in widths and colors according to requirements indicated on Drawings.
 - 1) Colors: As selected by the Architect from manufacturer's full range.
 - d. Apply finish coats after game-line and marker paint is fully cured.

3.5 PROTECTION

- A. Protect sports floors during remainder of construction period to allow finish to cure and to ensure that flooring and finish are without damage or deterioration at time of Substantial Completion.

1. Do not cover sports floors after finishing until finish reaches full cure, and not before seven days after applying last finish coat.
2. Do not move heavy and sharp objects directly over sports floors. Protect fully cured floor finishes and surfaces with plywood or hardboard panels to prevent damage from storing or moving objects over sports floors.

END OF SECTION 096466

SECTION 096513 - RESILIENT BASE AND 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. Resilient base.
 - 2. Resilient molding accessories.
 - 3. Resilient stair accessories.
- B. Related Sections:
 - 1. Section 096519 "Resilient Tile Flooring" for resilient floor tile.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each resilient product color, texture, and pattern required.
- C. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE (B-01)

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. B-01: Roppe Corporation, USA; 100 Black.
- B. Resilient Base Standard: ASTM F 1861.
 - 1. Material Requirement: Type TS (rubber, vulcanized thermoset).
 - 2. Manufacturing Method: Group I (solid, homogeneous).
 - 3. Style:
 - a. At Hard Surface Flooring: Cove (base with toe).
 - b. At Carpet Flooring: Straight.
- C. Minimum Thickness: 0.125 inch (3.2 mm).
- D. Height: 4 inches (102 mm) and 6 inches (152 mm).
- E. Lengths: Coils in manufacturer's standard length.

RESILIENT BASE AND ACCESSORIES

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- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Finish: Matte.

2.2 RESILIENT MOLDING ACCESSORY

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. Roppe Corporation, USA.
- B. Description: Carpet edge for glue-down applications, nosing for resilient floor covering, reducer strip for resilient floor covering, joiner for tile and carpet, and transition strips.
- C. Material: Rubber.
- D. Colors and Patterns: As indicated by manufacturer's designations.
 - 1. Color: Manufacturer and color shall match base.
 - 2. Description: Carpet edge for glue down applications; 1/4-inch high by 2-1/4 inches wide; from carpet to sealed or polished concrete.
 - a. Product: Roppe Corporation; No. 38.
 - 3. Description: Reducer strip for resilient floor covering to sealed or polished concrete.
 - a. Product: Roppe Corporation; No. 22 and No. 48.
 - 4. Description: Joiner for resinous flooring and carpet.
 - a. Product: Roppe Corporation; No. 65.

2.3 RUBBER STAIR ACCESSORIES

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flexco.
 - 2. Johnsonite; A Tarkett Company.
 - 3. Nora Systems, Inc.
 - 4. Roppe Corporation, USA.

- C. Stair Treads: ASTM F 2169.
 - 1. Type: TS (rubber, vulcanized thermoset) or TP (rubber, thermoplastic).
 - 2. Class: 2 (pattern; embossed, grooved, or ribbed).
 - 3. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees.
 - 4. Nosing Height: 1.77 inches.
 - 5. Thickness: 0.2 inch and tapered to back edge.
 - 6. Size: Lengths and depths to fit each stair tread in one piece.
 - 7. Integral Risers: Smooth, flat; in height that fully covers substrate.

- D. Landing Tile: Matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads. See Resilient floor tile section.

- E. Locations: Provide rubber stair accessories in areas indicated.

- F. Colors and Patterns: As indicated by manufacturer's designations.
 - 1. RF-3:
 - a. Manufacturer: Nora Systems, Inc.
 - b. Type: Tone on tone granular design.
 - 1) At Top Steps: Provide companion nosing.
 - c. Color:
 - 1) TBD

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Cove Base Adhesives: Not more than 50 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Base, Stair Treads and Accessories: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. 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.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products until Substantial Completion.

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END OF SECTION 096513

RESILIENT BASE AND ACCESSORIES

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SECTION 096519 - RESILIENT TILE FLOORING

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. Rubber floor tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of resilient floor tile.
 - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 2. Show details of special patterns.
- C. Samples for Initial Selection: For each type of floor tile indicated.
- D. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

RESILIENT TILE FLOORING

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2.2 RUBBER FLOOR TILE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Noraplan Environcare 2.0mm tile or comparable product by one of the following:
 - 1. Johnsonite.
- B. Tile Standard: ASTM F 1344, Class I-A, Homogeneous Rubber Tile with random scattered design.
- C. Hardness: Manufacturer's standard hardness, measured using Shore, Type A durometer according to ASTM D 2240.
- D. Wearing Surface: Textured.
 - 1. Pattern: Smooth.
- E. Thickness: 0.08 inch (2.0 mm).
- F. Size: 24 inches by 24 inches (610 by 610 mm).
- G. Colors: As indicated by manufacturer's designations.
 - 1. Reference Interior Finish Schedule for colors.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m) and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. 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.
 - b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.
- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis in pattern indicated.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles with grain running in one direction in pattern of colors and sizes indicated.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
1. Remove adhesive and other blemishes from surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
1. No polish required for LVT or rubber flooring.
- E. Cover floor tile until Substantial Completion.

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END OF SECTION 096519

RESILIENT TILE FLOORING

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SECTION 096566 - RESILIENT ATHLETIC FLOORING

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. Sheet flooring.

- B. Related Sections:

- 1. Section 096513 "Resilient Base and Accessories" for wall base and accessories installed with flooring.

1.3 SUBMITTALS

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

- B. Shop Drawings: Show installation details and locations of the following:

- 1. Floor patterns.
 - 2. Seam locations for sheet flooring.

- C. Samples for Verification: For each type, color, and pattern of flooring indicated, 6-inch- (150-mm-) square Samples of same thickness and material indicated for the Work.

- 1. Seam Samples: For each vinyl sheet flooring color and pattern required; with seam running lengthwise and in center of 6-by-9-inch (150-by-230-mm) Sample applied to a rigid backing and prepared by Installer for this Project.

- D. Qualification Data: For qualified sheet vinyl flooring Installer.

- E. Maintenance Data: For flooring to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Sheet Vinyl Flooring Installer Qualifications: An experienced Installer who has completed sheet vinyl flooring installations using seaming methods indicated for this Project and similar in

material, design, and extent to that indicated for this Project; who is acceptable to manufacturer; and whose work has resulted in installations with a record of successful in-service performance.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storing.
- B. Store materials to prevent deterioration. Store rolls upright.

1.6 FIELD CONDITIONS

- A. Adhesively Applied Products:
 - 1. Maintain temperatures during installation within range recommended in writing by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive flooring 48 hours before installation, during installation, and 48 hours after installation unless longer period is recommended in writing by manufacturer.
 - 2. After postinstallation period, maintain temperatures within range recommended in writing by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
 - 3. Close spaces to traffic during flooring installation.
 - 4. Close spaces to traffic for 48 hours after flooring installation unless manufacturer recommends longer period in writing.
- B. Install flooring after other finishing operations, including painting, have been completed.

1.7 COORDINATION

- A. Coordinate layout and installation of flooring with floor inserts for gymnasium equipment.

1.8 EXTRA MATERIALS

- A. Furnish extra materials, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Sheet Flooring: Furnish full-width rolls of not less than 10 linear feet (3 linear m) for each 500 linear feet (150 linear m) or fraction thereof, of each type, color, and pattern of flooring installed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. FloorScore Compliance: Resilient athletic flooring shall comply with requirements of FloorScore Standard.
- B. Low-Emitting Materials: Flooring system 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."

2.2 RESILIENT ATHLETIC FLOORING (SF-01)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide GERFLOR, TARAFLEX; SPORT M PLUS DTX, DryTex, or comparable product by one of the following:
 - 1. Johnsonite; a Tarkett company.
- B. All installation accessories and related components shall be made by or approved by the resilient athletic flooring manufacturer.

2.3 MATERIALS

- A. Sheet Flooring: Product shall consist of a 2.1 mm thick over 95% pure polyvinyl chloride (PVC) wear layer combined with pure PVC-CXP™ vertically elongated closed-cell foam cushion backing. D-Max™ multi-layer surface complex shall be reinforced with a non-woven fiberglass mesh placed between the wear layer and the foam backing to improve dimensional stability. Sanosol®, a fungistatic and bacteriostatic treatment shall be incorporated throughout the entire thickness. The wear surface shall be Triple-Action ProtecSol®, UV cured, factory applied, and permanently bonded to the surface of the resilient flooring. Field application of the surface treatment and/or Multi-Durometer products laminated or constructed in the field are unacceptable.
 - 1. Physical properties of the indoor resilient athletic flooring shall conform to the following minimums:
 - a. Width: 4'11" (1.5 m).
 - b. Length: 86'6" standard.
 - c. Total Thickness: 0.29 inch (7.35 mm).
 - d. Static Load Limit ASTM F 970 Modified: ≤ 200 psi.
 - e. Dynamic Load Limit (N) DIN V 18032-2 (April 2001): ≥ 1,000 N.
 - f. Chemical Resistance ASTM D 543: Excellent.
 - g. Fungus Resistance ASTM G 21: Complete.
 - h. Critical Radiant Flux ASTM D 648: Class 1.
 - i. Sound Insulation ISO 717/2: > 18 dB.

- j. Ball Rebound DIN V 18032-2 (April 2001): > 90%.
- k. Force Reduction (Shock Absorption) DIN V 18032-2 (April 2001): > 35%.
- 2. Color: Sport M Plus; Maple Design.
- 3. Texture: Slightly grained; Hardwood Design Series.
- 4. Bacteriostatic and Fungicidal Treatment: Manufacturer's factory-applied permanent treatment.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Gerflor; Sanosol.
- 5. Textile Backing: Gerflor Dry-Tex Textile Backing, designed for full spread adhesive attachment to substrate, so as not to hold, contain or vent moisture which could encourage mold growth and capable of withstanding rolling loads.
- B. Welding Rod: As supplied by the indoor resilient athletic flooring manufacturer or supplier. Color to blend with the indoor resilient athletic flooring color or design. All seams shall be welded to create a monolithic and impermeable surface.
- C. Adhesive: As approved by the indoor resilient athletic flooring manufacturer.

2.4 ACCESSORIES

- A. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by flooring manufacturer.
- B. Adhesives: Water-resistant type recommended in writing by manufacturer for substrate and conditions indicated.
 - 1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Game-Line and Marker Paint: Complete system including primer, if any, compatible with flooring and recommended in writing by flooring and paint manufacturers for use indicated.
 - 1. VOC content: Provide products with VOC content not more than 150 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of flooring.

1. Sand the entire surface of the concrete slab.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Alkalinity Testing: Perform pH testing according to ASTM F 710. Proceed with installation only if pH readings are not less than 7.0 and not greater than 8.5.
3. Moisture Testing:

- a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. in 24 hours.

- 1) Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m) and perform no fewer than two tests in each installation area and with test areas evenly spaced in installation areas.

C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended in writing by manufacturer. Do not use solvents.

D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

E. Move flooring and installation materials into spaces where they will be installed at least 48 hours in advance of installation unless manufacturer recommends a longer period in writing.

1. Do not install flooring until they are same temperature as space where they are to be installed.

F. Sweep and vacuum clean substrates to be covered by flooring immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust.

G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 FLOORING INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions.
- B. Scribe, cut, and fit flooring to butt neatly and tightly to vertical surfaces, equipment anchors, floor outlets, and other interruptions of floor surface.
- C. Extend flooring into toe spaces, door reveals, closets, and similar openings unless otherwise indicated.
- D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating subfloor markings on flooring. Use nonpermanent, nonstaining marking device.

3.4 SHEET FLOORING INSTALLATION

- A. Unroll sheet flooring and allow it to stabilize before cutting and fitting.
- B. Lay out sheet flooring as follows:
 - 1. Maintain uniformity of flooring direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (150 mm) away from parallel joints in flooring substrates.
 - 3. Match edges of flooring for color shading at seams.
 - 4. Locate seams per approved Shop Drawings.
- C. Adhered Flooring: Adhere products to substrates using a full spread of adhesive applied to substrate to comply with adhesive and flooring manufacturers' written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.
 - 1. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- D. Sheet Flooring Seams: Prepare and finish seams to produce surfaces flush with adjoining flooring surfaces.
 - 1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and use welding bead to permanently fuse sections into a seamless flooring.

3.5 CLEANING AND PROTECTING

- A. Perform the following operations immediately after completing flooring installation:
 - 1. Remove adhesive and other blemishes from flooring surfaces.
 - 2. Sweep and vacuum flooring thoroughly.
 - 3. Damp-mop flooring to remove marks and soil after time period recommended in writing by manufacturer.

- B. Protect flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 - 1. Do not move heavy and sharp objects directly over flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 096566

SECTION 096723 - RESINOUS FLOORING

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 resinous flooring systems.
- B. Section includes thick-bed mortar build-up material at depressed slabs.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Initial Selection: For each type of exposed finish required.
- C. Samples for Verification: For each resinous flooring system required, 6 inches (150 mm) square, applied to a rigid backing by Installer for this Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- B. Material Certificates: For each resinous flooring component, from manufacturer.
- C. Material Test Reports: For each resinous flooring system, by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

- B. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Apply full-thickness mockups on 96-inch- (2400-mm-) square floor area selected by Architect.
 - a. Include 96-inch (2400-mm) length of integral cove base with inside and outside corner.
 - 2. Simulate finished lighting conditions for Architect's review of mockups.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair

materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

2.2 RESINOUS FLOORING

- A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Desco Coatings; Cremona TG or a comparable product by one of the following:
 - a. Duraflex, Inc.
 - b. Sherwin-Williams Company, General Polymers.
 - c. Stonhard.
 - d. Tennant.
 - e. Tnemec Inc.
- B. System Characteristics:
1. Color and Pattern: As indicated by product designation listed above.
 - a. ERF-1: Match Whitewater.
 2. Wearing Surface: Textured for slip resistance.
 3. Overall System Thickness: 1/8 inch (3.2 mm).
 4. Federal Agency Approvals: USDA approved for food-processing environments.
- C. Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.
1. Formulation Description: High solids.
- D. Waterproofing Membrane: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.
1. Formulation Description: High solids.
- E. Reinforcing Membrane: Flexible resin formulation that is recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated and that inhibits substrate cracks from reflecting through resinous flooring.
1. Formulation Description: 100 percent solids.
 - a. Provide fiberglass scrim embedded in reinforcing membrane.
- F. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

G. Body Coats:

1. Resin: Epoxy.
2. Formulation Description: 100 percent solids.
3. Type: Clear.
4. Application Method: Self-leveling slurry with broadcast aggregates.
5. Number of Coats: Two.
6. Thickness of Coats: 1/16 inch (1.6 mm).
7. Aggregates: Colored quartz.

H. Topcoats: Sealing or finish coats.

1. Resin: Epoxy.
2. Formulation Description: High solids.
3. Type: Clear.
4. Number of Coats: As required to achieve finish.
5. Thickness of Coats: 1/16 inch (1.6 mm).
6. Finish: Matte.

I. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Compressive Strength: 9,200 per ASTM C 579.
2. Tensile Strength: 1,650 per ASTM C 307.
3. Flexural Modulus of Elasticity: 4,000 per ASTM C 580.
4. Impact Resistance: No chipping, cracking, or delamination and not more than 1/16-inch (1.6-mm) permanent indentation per MIL-D-3134.
5. Resistance to Elevated Temperature: No slip or flow of more than 1/16 inch (1.6 mm) per MIL-D-3134.
6. Abrasion Resistance: 0.08 maximum weight loss per ASTM D 4060.
7. Flammability: Self-extinguishing per ASTM D 635.
8. Hardness: 85 to 90, Shore D per ASTM D 2240.

J. Integral Cove Base:

1. At All Toilet Locations: Provide 4-inch-high integral coved base with 1 inch radiused cove and bullnosed top edge termination. Provide keyed joint where resinous flooring terminates with other materials.

2.3 HICK BED MORTAR

- A. Thick Bed Mortar: Provide per ANSI A108 and A118 for slope to shower drains at depressed slabs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 - 1. Roughen concrete substrates as follows:
 - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
 - b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.
 - 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
 - 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with application of resinous flooring 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) of slab area in 24 hours.
 - b. Plastic Sheet Test: ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
 - c. Relative Humidity Test: Use in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 - 4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
 - 1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.
- D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

3.2 APPLICATION

- A. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 - 3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Waterproofing Membrane: Apply waterproofing membrane over entire substrate surface, in manufacturer's recommended thickness.
 - 1. Apply waterproofing membrane to integral cove base substrates.
- D. Reinforcing Membrane: Apply reinforcing membrane to entire substrate surface.
- E. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: 4 inches (100 mm) high.
- F. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.
 - 1. Aggregates: Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.
- G. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel marks and roughness using method recommended by manufacturer.
- H. Grout Coat: Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat.
- I. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.3 FIELD QUALITY CONTROL

- A. Material Sampling: Owner may, at any time and any number of times during resinous flooring application, require material samples for testing for compliance with requirements.

1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
 2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
 3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.
- B. Core Sampling: At the direction of Owner and at locations designated by Owner, take one core sample per 1000 sq. ft. (92.9 sq. m) of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring. Correct deficiencies in installed flooring as indicated by testing.

3.4 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

SECTION 096813 - TILE CARPETING

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. This Section includes modular, tufted carpet tile.
- B. Related Sections include the following:
 - 1. Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Type, color, and location of insets and borders.
 - 8. Type, color, and location of edge, transition, and other accessory strips.
 - 9. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- (300-mm-) long Samples.

- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- E. Qualification Data: For Installer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.
- G. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.
- H. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
 - 1. Flooring subcontractor shall not subcontract installation labor without advance approval from the Architect and Owner.
- B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.7 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).

PART 2 - PRODUCTS

2.1 CARPET TILE (CPT-01, CPT-02, CPT-03, CPT-04, CPT-05)

- A. Products Subject to compliance with requirements, provide the following:
 - 1. Tarkett; Substance 11449
 - a. Colors:
 - 1) Reference Interior Finish Schedule for colors.
- B. Fiber Content: 100 percent solution dyed nylon.
- C. Fiber Type: Dynex SD Nylon.
- D. Pile Characteristic: Patterned Loop Pile.
- E. Stitches: 9.60 /in.
- F. Gage: 5/64 inch.

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- G. Total Thickness: 0.200 inch.
- H. Tufted Density: 122.88 tufts/sq in.
- I. Primary Backing/Backcoating: Synthetic Non Woven
- J. Secondary Backing: Modular ER3.
- K. Size: 24 by 24 inches
- L. Installation Method: Vertical Ashlar
- M. Applied Treatments:
 - 1. Soil-Resistance Treatment: Eco-Ensure.
 - 2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as follows:
 - a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

2.2 CARPET TILE (CPT-06, CPT-07)

- A. Products Subject to compliance with requirements, provide the following:
 - 1. Tarkett; Bindery 11449
 - a. Color:
 - 1) Reference Interior Finish Schedule for Colors
- B. Fiber Content: 100 percent solution dyed nylon.
- C. Fiber Type: Dynex SD Nylon.
- D. Pile Characteristic: Patterned loop pile.
- E. Stitches: 10.5 /in.
- F. Gage: 5/64 inch.
- G. Total thickness: 0.141 inch
- H. Tufted Density: 134.4 tufts/sq in.
- I. Primary Backing/Backcoating: Synthetic Non Woven
- J. Secondary Backing: Modular ER3.

- K. Size: 24 by 24 inches
- L. Installation Method: Vertical Ashlar
- M. Applied Treatments:
 - 1. Soil-Resistance Treatment: Eco-Ensure.
 - 2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as follows:
 - a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

2.3 CARPET TILE (CPT-08)

- A. Products: Subject to compliance with requirements, provide the following:
 - 1. Super Nop, 52 Modular Tile/Charcoal.
- B. Fiber Content: 100 Solution Dyed UV Stabilized Polypropylene
- C. Pile Characteristic: Geometric Pattern.
- D. Pile Height: 3/8 inch.
- E. Face Weight: 52 oz/sq. yd.
- F. Backing system: Eco-Bitumen.
- G. Size: 19.69 inches by 19.69 inches.
- H. Installation Method: Quarter turn.

2.4 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - 1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
 - 2. Subfloor finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 4. Seven days prior to installation, provide the Architect and Owner written documentation of the results of calcium chloride and pH tests at a rate of one test per 2,000 square feet, or enough to meet manufacturer's requirements for the warranty.
 - 5. Provide to the Architect and Owner written documentation of the space temperature and relative humidity for the seven days prior to the start of installation.
 - 6. Installation shall be a 100% pressure sensitive type.
 - 7. One week prior to installation, submit to the Architect and Owner the name and credentials of the project foreman that will be responsible for quality control on the project. The foreman will be required to be on the project during 50% or more of the installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Use manufacturer approved adhesive.
- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protection of Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 097200 - WALL COVERINGS

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. Custom graphic vinyl wall covering.
- B. Related Sections:
 - 1. Section 099123 "Interior Painting" for priming wall surfaces.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.
- B. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement, veneer matching, seams and termination points.
- C. Samples for Verification: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 36-inch- (914-mm-) long in size.
 - 1. Wall-Covering Sample: From same production run to be used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of fabric.
- D. Product Schedule: For wall coverings. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

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

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Wall-Covering Materials: For each type, color, texture, and finish, full width by length to equal to 5 percent of amount installed.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at levels intended for occupants after Project completion during the remainder of the construction period.
- B. Lighting: Do not install wall covering until lighting that matches conditions intended for occupants after Project completion is provided on the surfaces to receive wall covering.
- C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 50 or less.

2. Fire-Growth Contribution: No flashover and heat and smoke release according to NFPA 265.

2.2 CUSTOM GRAPHIC VINYL WALL COVERING (GWC)

- A. Product: Subject to compliance with requirements, provide the following:
 1. National Wallcovering; CDigital Surfaces; Custom Color.
 - a. Location: Reference Architectural Drawings for Locations.
 - b. Architect to provide custom image and colors.
 - c. Contractor's bid must include all costs for providing material for and in response to Architect's reviews of custom design and colors.
 2. Type II Vinyl Wallcovering – Type 2 Vinyl Stipple Substrate.
- B. Description: Provide mildew-resistant products in rolls from same production run and complying with the following:
 1. FS CCC-W-408D and CFFA-W-101-D for Type II, Medium-Duty products.
- C. Width: 54 inches (1372 mm).
- D. Weight: 20 oz. per linear yard.
- E. Backing: Non-woven fabric.
 1. Fiber Content: 100% vinyl.
- F. Adhesive: Mildew-resistant, non-staining, strippable adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.
- G. Primer/Sealer: Mildew resistant, complying with requirements in Section 099123 "Interior Painting" and recommended in writing by primer/sealer and wall-covering manufacturers for intended substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, maximum moisture content, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.
- C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
 - 1. Gypsum Board: Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
 - 2. Painted Surfaces: Treat areas susceptible to pigment bleeding.
- D. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finish with fine sandpaper.
- E. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.
- F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

3.3 WALL-COVERING INSTALLATION

- A. Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated.
- B. Cut wall-covering strips in roll number sequence. Change the roll numbers at partition breaks and corners.
- C. Install strips in same order as cut from roll.
- D. Install wall covering without lifted or curling edges and without visible shrinkage.
- E. Install seams vertical and plumb at least 6 inches (150 mm) from outside corners and 6 inches (150 mm) from inside corners unless a change of pattern or color exists at corner. Horizontal seams are not permitted.
- F. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without overlaps or gaps between strips.
- G. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

3.4 CLEANING

- A. Remove excess adhesive at seams, perimeter edges, and adjacent surfaces.

- B. Use cleaning methods recommended in writing by wall-covering manufacturer.
- C. Replace strips that cannot be cleaned.
- D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION 097200

SECTION 097723 - FABRIC-WRAPPED 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. This Section includes the following:
 - 1. Fabric-wrapped tackwall panels.

1.3 SUBMITTALS

- A. Product Data: For each type of panel edge, core material, and mounting indicated.
- B. Shop Drawings: For fabric-wrapped panels. Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge and core materials.
 - 1. Include elevations showing panel sizes and direction of fabric weave and pattern matching.
- C. Coordination Drawings: Show intersections with wall base, electrical outlets and switches, thermostats, air outlets and inlets, and other adjacent work.
- D. Samples for Verification: For the following products. Prepare Samples from same material to be used for the Work.
 - 1. Fabric: Sample from dye lot to be used for the Work, and as follows:
 - a. With specified treatments applied.
 - b. Show complete pattern repeat.
 - c. Mark top and face of fabric.
 - 2. Panel Edge: 12-inch- (300-mm-) long Sample showing edge profile, corner, and finish.
 - 3. Core Material: 12-inch- (300-mm-) square Sample showing corner.
 - 4. Mounting Device: Full-size Sample.
 - 5. Sample Panels: No larger than 36 by 36 inches (914 by 914 mm). Show joints and mounting methods.
- E. Qualification Data: For fabricator and testing agency.

- F. Maintenance Data: For fabric-wrapped panels to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal recommendations.
- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations: Obtain fabric-wrapped panels through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide fabric-wrapped panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and fabric-wrapped panel manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials and panels in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.
- C. Protect panel edges from crushing and impact.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fabric-wrapped panels until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install fabric-wrapped panels until a permanent level of lighting is provided on surfaces to receive fabric-wrapped panels.
- C. Air-Quality Limitations: Protect fabric-wrapped panels from exposure to airborne odors such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify locations of fabric-wrapped panels by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fabric-wrapped panels that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, fabric sagging, distorting, or releasing from panel edge; or warping of core.
 2. Warranty Period: Two years from date of Substantial Completion.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Fabric: For each fabric, color, and pattern installed, provide length equal to 10 percent of amount installed, but no fewer than 10 yards (9 m).
 2. Fabric-Wrapped Panel Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than 5 attachment devices.

PART 2 - PRODUCTS

2.1 CORE MATERIALS

- A. Mineral-Fiber Board: With maximum flame-spread and smoke-developed indexes of 15 and 5, respectively.
1. Product: Subject to compliance with requirements, provide United States Gypsum Company; 1/2-inch Micore.

2.2 FABRIC-WRAPPED TACKWALL PANELS

- A. Tackwall Panels: Consisting of tackboard panels with vinyl wallcovering facing on core indicated:
1. Product: Carnegie Xorel; Meteor 6427.
 - a. Colors:
 - 1) Reference Architectural Drawings for Locations
 - 2) Reference Interior Finish Schedule for Colors
 2. Width: As indicated on the Drawings.
 3. Height: As indicated on the Drawings.

FABRIC-WRAPPED PANELS

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4. Edge Profile: Fabric wrapped.
5. Adhesive: Manufacturer's standard.

2.3 FABRICATION

- A. Fabric-Wrapped Panels: Panel construction consisting of facing material adhered or attached to face, edges and back border of dimensionally stable core; with rigid edges to reinforce panel perimeter against warpage and damage.
- B. Fabric Facing: Stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other foreign matter. Applied with visible surfaces fully covered.
 1. Where square corners are indicated, tailor corners.
 2. Where fabrics with directional or repeating patterns or directional weave are indicated, mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent panels.
- C. Dimensional Tolerances of Finished Units: $\pm 1/16$ inch (1.6 mm) for the following:
 1. Thickness.
 2. Edge straightness.
 3. Overall length and width.
 4. Squareness from corner to corner.
 5. Chords, radii, and diameters.
- D. Mounting Devices: Concealed on back of panel, recommended to support weight of panel, and as follows:
 1. Metal Clips or Bar Hangers: Manufacturer's standard two-part metal "Z" clips, with one part of each clip mechanically attached to back of panel and the other part to substrate, designed to permit unit removal.

2.4 EXAMINATION

- A. Examine fabric, substrates, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of fabric-wrapped panels.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

2.5 INSTALLATION

- A. Wall Panels: Install fabric-wrapped panels in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other panels, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.

- B. Comply with fabric-wrapped panel manufacturer's written instructions for installation of panels using type of concealed mounting accessories indicated or, if not indicated, as recommended by manufacturer. Anchor panels securely to supporting substrate.
- C. Match and level fabric pattern and grain among adjacent panels.
- D. Installation Tolerances: As follows:
 - 1. Variation from Plumb and Level: $\pm 1/16$ inch (1.6 mm).
 - 2. Variation of Panel Joints from Hairline: Not more than $1/16$ inch (1.6 mm) wide.

2.6 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels with fabric facing, on completion of installation, to remove dust and other foreign materials according to manufacturer's written instructions.

2.7 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that fabric-wrapped panels are without damage or deterioration at time of Substantial Completion.
- B. Replace panels that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 097723

SECTION 098415 – CEMENTITIOUS WOOD FIBER WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes: Cementitious wood fiber acoustical wall panel system and installation accessories.
- B. Related Sections:
 - 1. Section 091123 “Interior Painting” for field-painting wall panels.

1.3 REFERENCES

- A. ASTM International:
 - 1. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Provide acoustical wall panel assembly designed and tested to provide surface burning characteristics (ASTM E84) as follows:
 - a. Flamespread: 5.
 - b. Smoke Developed: 15.
 - 2. Provide acoustical wall panel system which has been manufactured, fabricated and installed to provide Noise Reduction Coefficient (NRC) rating as follows:
 - a. NRC Rating: 1.05.

1.5 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Section 013300 “Submittal Procedures.”
- B. Product Data: Submit manufacturer’s product data and installation instructions.
 - 1. Recommended procedures for normal cleaning and removal of stains including precautions in use of cleaning materials that may be detrimental to surfaces.
- C. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: Upon request, submit certified test reports from recognized test laboratories.
 - 2. Certificates: Submit manufacturer’s certificate that products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.
- B. Regulatory Requirements and Approvals: Comply with requirements below.
 - 1. International Conference of Building Officials (ICBO):
 - a. ICBO Research Report No. 1116.
 - 2. Underwriters’ Laboratories of Canada (ULC) label.
 - a. Structural Cement-Fiber Unit-535X.

1.7 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Division 01 Section “Product Requirements.”
- B. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - 1. Prevent soiling, physical damage or wetting.
 - 2. Store cartons open at each end to stabilize moisture content and temperature.

1.8 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:

1. Do not install acoustical panels until building is closed in and HVAC system is operational.
2. Locate materials onsite at least 24 hours before beginning installation to allow materials to reach temperature and moisture content equilibrium.
3. Maintain the following conditions in areas where acoustical materials are to be installed 24 hours before, during and after installation:
 - a. Relative Humidity: 65% to 75%.
 - b. Uniform Temperature: 55 to 70 degrees F (13 to 21 degrees C).

1.9 MAINTENANCE

- A. Extra Materials: Provide two additional panels for use by Owner in building maintenance and repair.

PART 2 - PRODUCTS

2.1 ACOUSTICAL WALL PANEL SYSTEM

- A. Manufacturer: Tectum, Inc.
 1. Contact: 105 South Sixth Street, Newark OH 43055; telephone: 888-977-9691 or 740-345-9691; e-mail info@tectum.com; website www.tectum.com.
- B. Proprietary Systems: Acoustical wall panel systems, including the following:
 1. Tectum Finale Wall and Ceiling Panels:
 - a. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
 - b. Thickness: 1-1/2-inch baseboard plus 2 inches Tectum furring with SoniCor fiber core between the furring.
 - c. Edge: Beveled.
 - d. Width: As indicated on drawings.
 - e. Length: As indicated on drawings.
 - f. Color: As indicated on drawings.
 - g. Mounting Style: "A" screw attached to suitable substrate.

2.2 ACCESSORIES

- A. Provide accessories as follows:
 1. Tectum Painted Head Drywall Screws:
 - a. Material: Steel.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the acoustical wall panel system manufacturer.
- B. Install materials in accordance with governing regulations, fire resistance rating requirements and industry standards applicable to work.
 - 1. Comply with CISCA Code of Practices.

3.2 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Examine surfaces scheduled to receive suspended or directly attached acoustical units for unevenness, irregularities and dampness that would affect quality and execution of work.
 - 2. Do not proceed with installation of wall panel system until unacceptable conditions are corrected.

3.3 INSTALLATION

- A. Screw head to be flush with panel surface.
- B. Cover field cut edges.
- C. Paint as indicated on the Drawings.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel, trim, moldings and suspension members to comply with manufacturer's instructions for cleaning.
- B. Touch up any minor finish damage.
- C. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.5 PROTECTION

- A. Protect installed work from damage due to subsequent construction activity, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the Owner.

LEE'S SUMMIT MIDDLE SCHOOL #4
PACKAGE 3 – BUILDING & SITE
LEE'S SUMMIT, MISSOURI

13-20102-00
8 OCTOBER 2020
PERMIT SET

END OF SECTION 098415

CEMENTITIOUS WOOD FIBER WALL PANELS

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SECTION 098433 - SOUND-ABSORBING WALL UNITS

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 shop-fabricated, acoustical panel units tested for acoustical performance, including the following:
 - 1. Sound-absorbing wall panels.
 - 2. Sound-diffusing wall panels.
 - 3. Ceiling sound diffusers.
- B. Related Requirements:
 - 1. Section 092216 “Non-Structural Metal Framing” for ceiling suspension systems.
 - 2. Section 092900 “Gypsum Board.”
 - 3. Section 095113 “Acoustical Panel Ceilings.”

1.3 DEFINITIONS

- A. NRC: Noise Reduction Coefficient.
- B. SAA: Sound Absorption Average.

1.4 REFERENCES

- A. ASTM C 423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method: 2000.
- B. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2000a.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include fabric facing, panel edge, core material, and mounting indicated.
- B. Shop Drawings: For unit assembly and installation.
 - 1. Include plans, elevations, sections, and mounting devices and details.
 - 2. Include details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge profile and core materials.
 - 3. Include details at cutouts and penetrations for other work.
 - 4. Include direction of fabric weave and pattern matching.
- C. Samples for Initial Selection: For each type of fabric facing.
 - 1. Include Samples of hardware and accessories involving color or finish selection.
- D. Samples for Verification: For the following products:
 - 1. Fabric: Full-width by approximately 36-inch- (900-mm-) long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
 - 2. Panel Edge: 12-inch- (300-mm-) long Sample(s) showing each edge profile, corner, and finish.
 - 3. Core Material: 12-inch- (300-mm-) square Sample at corner.
 - 4. Mounting Devices: Full-size Samples.

1.7 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Electrical outlets, switches, and thermostats.
 - 2. Items penetrating or covered by units including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Alarms.
 - e. Sprinklers.
 - f. Access panels.
 - 3. Show operation of hinged and sliding components covered by or adjacent to units.
- B. Product Certificates: For each type of unit.

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

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of unit to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal instructions.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Fabric: For each fabric, color, and pattern installed, provide length equal to 10 percent of amount installed, but no fewer than 10 sq. yd. (9 sq. m), full width of bolt.
 2. Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than five devices, including unopened adhesives.

1.10 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 10 years of experience in producing acoustical products of the types specified herein.
- B. Installer Qualifications: Acceptable to the manufacturer of the acoustical products being installed.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials, fabrication, and installation.
 1. Build mockup of typical wall area as shown on Drawings.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and unit manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install units until a permanent level of lighting is provided on surfaces to receive the units.
- C. Air-Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication, and indicate them on Shop Drawings.

1.13 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace units and components that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to the following:
 - a. Acoustical performance.
 - b. Fabric sagging, distorting, or releasing from panel edge.
 - c. Warping of core.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain wall units specified in this Section from single source from single manufacturer.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Conwed Designscape; an Owens Corning company.
 - 2. Decoustics Limited; a Saint Gobain company.
 - 3. Golterman & Sabo.
 - 4. Panel Solutions, Inc.
 - 5. Wall Technology, Inc.; an Owens Corning company.
 - 6. Wenger Corporation.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

2.3 SOUND ABSORPTION REQUIREMENTS

- A. Sound Absorption must meet those shown in the graph included in these specifications.
1. Documentation of independent testing laboratory is required.

Hz	125	250	500	1000	2000	4000	N.R.C.
LFA-V2	.66	.87	.82	.47	.18	.18	.60

2.4 SOUND DIFFUSION REQUIREMENTS

- A. Sound Diffusion Coefficients must meet those shown in graph included in these specifications.
1. Documentation of independent testing laboratory is required.

Hz	125	250	500	1000	2000	4000	8000
ADP	0.56	0.53	0.51	0.50	0.52	0.58	0.60

2.5 SOUND-ABSORBING WALL UNITS (AP)

- A. Sound-Absorbing Wall Panel: Acousti-Panels: Core of 6 to 7 pcf (96 to 112 kg/cu m) single fiberglass with chemically hardened edges, impact-resistance, acoustically transparent copolymer sheet with seamless finish material wrapped and bonded to backside of panels.
1. Mounting: Back mounted with manufacturer's standard adhesive and impaling clips, secured to substrate.
 2. Nominal Core Thickness: 2 inches (51 mm); NRC 1.05.
 3. Nominal Core Thickness: 1 inch (25 mm) NRC .85 (At B121C, B121D and C101A only)

4. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
5. Edge Profile: Square.
6. Corner Detail in Elevation: Square with continuous edge profile indicated.
7. Facing Material:
 - a. Manufacturer: Momentum
 - 1) Pattern/Color: As indicated on Finish Schedule

2.6 SOUND-DIFFUSING AND -REFLECTING WALL UNITS AND CEILING UNITS

A. Ceiling Mounted Diffusers: Asymmetric pyramidal units with properties as follows:

1. CD-Standard: Glass fiber mat core laminated with fire retardant resin; NRC 0.15.
2. Size: 48 inches by 48 inches, as indicated on the Drawings.
3. Finish: Textured gelcoat.
 - a. Color: White.
4. Mounting: Lay-in ceiling grid system as specified in Section 095113 "Acoustical Panel Ceilings."

B. Wall Mounted Diffusers: Barrel-shaped units with properties as follows:

1. WD – Standard: Glass fiber mat core laminated with fire retardant resin; NRC 0.20.
2. Orientation: As indicated on the Drawings.
3. Size: As indicated on the Drawings.
4. Mounting: Two-part mechanical clip at top and hook and loop at bottom.
5. Facing Material:
 - a. Reference Architectural Plans for Locations
 - b. Reference Interior Finish Schedule for manufacturer and color

2.7 FABRICATION

- A. Standard Construction: Use manufacturer's standard construction unless otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.
- B. Edge Hardening: For glass-fiber board cores, chemically harden core edges and areas of core where mounting devices are attached.
- C. Core-Face Layer: Evenly stretched over core face and edges and securely attached to core; free from puckers, ripples, wrinkles, or sags.

- D. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.
 - 1. Square Corners: Tailor corners.
 - 2. Radius and Other Nonsquare Corners: Attach facing material so there are no seams or gathering of material.
 - 3. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent units.

- E. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch (1.6 mm) for the following:
 - 1. Thickness.
 - 2. Edge straightness.
 - 3. Overall length and width.
 - 4. Squareness from corner to corner.
 - 5. Chords, radii, and diameters.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, fabricated units, substrates, areas, and conditions for compliance with requirements, installation tolerances, and other conditions affecting unit performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with manufacturer's written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.
- C. Align fabric pattern and grain with adjacent units and as indicated on Drawings.

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb and Level: Plus or minus 1/16 inch (1.6 mm) in 48 inches (1200 mm), noncumulative.
- B. Variation of Joint Width: Not more than 1/16-inch (1.6-mm) variation from hairline in 48 inches (1200 mm), noncumulative.

3.4 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 098433

SECTION 099113 - EXTERIOR PAINTING

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. Primers.
- 2. Finish coatings.

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for shop priming metal fabrications.
- 2. Section 099300 "Staining and Transparent Finishing" for surface preparation and application of wood stains and transparent finishes on exterior wood substrates.
- 3. Section 099600 "High-Performance Coatings".

1.3 ACTION SUBMITTALS

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

- 1. Include preparation requirements and application instructions.
- 2. Indicate VOC content.

- B. Samples: For each type of topcoat product.

- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

- 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
- 2. Apply coats on Samples in steps to show each coat required for system.
- 3. Label each coat of each Sample.
- 4. Label each Sample for location and application area.

- D. Product Schedule: Use same designations indicated on Drawings and in the Exterior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following. No substitutions.
 - 1. Sherwin-Williams Company (The).
- B. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.

- B. Colors: As indicated in a color schedule.

2.3 PRIMERS

- A. Alkyd Metal Primer: Corrosion-resistant, solvent-based, alkyd primer formulated for use on prepared ferrous metals subject to industrial and light marine environments.
 - 1. Product: Subject to compliance with requirements, provide the following:
 - a. S-W Kem Kromic Universal Metal Primer, B50 series.

2.4 FINISH COATINGS

- A. Exterior, Water-Based, Light Industrial Coating, Semigloss: Corrosion-resistant, water-based, pigmented, emulsion coating formulated for resistance to blocking (sticking of two painted surfaces), water, alkalis, moderate abrasion, and mild chemical exposure and for use on exterior, primed, wood and metal surfaces.
 - 1. Product: Subject to compliance with requirements, provide the following:
 - a. S-W DTM Acrylic Semi-Gloss Coating, B66-200 Series.
 - 2. Gloss Level: Manufacturer's standard semigloss finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.

- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 3.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint exterior side and edges of exterior doors and entire exposed surface of exterior door frames.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in the Exterior Painting Schedule may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.
 - 6. All doors and frames shall be spot-primed prior to receiving finish coats, to cover scratches and abuse incurred during construction.
- B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written instructions, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written instructions.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates:

1. Water-Based, Light Industrial Coating System:

- a. Prime Coat: Alkyd metal primer or shop primer specified in Section in which substrate is specified.
- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

B. Galvanized-Metal Substrates:

1. Water-Based, Light Industrial Coating System:

- a. Prime Coat: alkyd metal primer or shop primer specified in Section in which substrate is specified.
- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

C. Color(s):

- 1. Hollow Metal Doors and Frames: SW 7019 Gauntlet Gray.
- 2. Natural Gas Piping: Match wall surface(s) where occurring.
- 3. Bollards: SW 7019 Gauntlet Gray, unless otherwise indicated.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on interior substrates.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Related Requirements:
 - 1. Section 051200 "Structural Steel" for shop priming of metal substrates with primers specified in this Section.
 - 2. Section 055000 "Metal Fabrications" for shop priming metal fabrications.
 - 3. Section 055213 "Pipe and Tube Railings" for shop priming pipe and tube railings.
 - 4. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
 - 5. Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood surfaces.
 - 6. Section 099600 "High-Performance Coatings">

1.3 DEFINITIONS

- A. Exposed Surfaces: Surfaces of products, assemblies, and components visible from any angle after final installation. Includes internal surfaces visible when operable doors, panels or drawers are open, and surfaces visible behind registers, grilles, or louvers.

- B. Concealed Surfaces: Surfaces permanently hidden from view in finished construction and which are only visible after removal or disassembly of part or all of product or assembly.
- C. Gloss Levels:
 - 1. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
 - 2. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
 - 3. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
 - 4. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
 - 5. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
 - 6. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
 - 7. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.
- D. System DFT: Dry film thickness of entire coating system unless otherwise noted.

1.4 ACTION SUBMITTALS

- A. Product Data: For each paint system indicated, including primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include for color designations.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.7 FIELD CONDITIONS

- A. Environmental Conditions: Comply with more restrictive of following or manufacturer's requirements under which systems can be applied.
 1. Provide continuous ventilation during application of coatings to exhaust hazardous fumes.
 2. Provide heating necessary to maintain surface and ambient temperatures within specified limits.
 3. Maintain temperature and humidity conditions for minimum 24 hours before, during, and 48 hours after application of finishes, unless longer times are required by manufacturer.

4. Do not permit wide variations in ambient temperatures which might result in condensation on freshly coated surfaces.
5. Provide illumination of not less than 80 footcandles measured mid-height at substrate surface during application of coatings.
6. Apply water reducible coatings only when ambient and surface temperatures are between 50 degrees F and 90 degrees F.
7. Apply solvent reducible coatings only when ambient and surface temperatures are between 45 degrees F and 90 degrees F.
8. Do not apply coatings under any of following conditions:
 - a. When surfaces are damp or wet.
 - b. When relative humidity is less than 20 percent or exceeds 85 percent.
 - c. When temperature is less than 5 degrees F above dew point.
 - d. When dust may be generated before coatings have dried.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Sherwin-Williams Company (The).
 2. No substitutions.

2.2 PAINT, GENERAL

- A. Material Compatibility:
 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Coatings:
 1. Ready-mixed, factory tinted, best professional grade produced by manufacturer.
 2. Use manufacturer's appropriate base materials to achieve required colors.
 3. Fully grind pigments to maintain soft paste consistency in vehicle.
 4. Capable of being dispersed into uniform, homogeneous mixture.
 5. Possess good flowing and brushing properties.
 6. Capable of drying or curing free of streaks or sags and yielding specified finish.
 7. VOC content of field applied coatings shall comply with local governing authorities.
- C. Colors: As indicated on Finish Schedule.

2.3 PRIMERS/SEALERS

- A. Interior Precast Concrete: Latex-based primer.
 - 1. S-W Loxon Concrete & Masonry Primer, 50 – 100 sq ft/gallon.
- B. Interior Concrete Masonry: Block filler, Latex.
 - 1. S-W PrepRite Block Filler, B25W25, 75 – 125 sq ft/gallon, but not less than that required to achieve a pinhole-free surface.
- C. Interior Gypsum Board Primer: Latex-based primer.
 - 1. Sherwin-Williams; S-W ProMar 200 Zero VOC Primer, B28W, 4 mils wet, 1.5 mils dry, per coat.
- D. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.
 - 1. S-W Kem Kromik Universal Metal Primer, B50 Series, 2.5 – 4 mils dry, per coat.
- E. Interior Zinc-Coated Metal Primer: Factory-formulated galvanized metal primer.
 - 1. S-W Kem Kromik Universal Metal Primer, B50 Series, 2.5 – 4 mils dry, per coat.

2.4 FINISH COATS

- A. Latex System:
 - 1. S-W ProMar 200 Zero VOC Latex Eg-Shel, 4 mils wet, 1.6 mils dry, per coat.
 - 2. S-W ProMar 200 Zero VOC Latex Flat, 4 mils wet, 1.6 mils dry, per coat.
- B. Light-Industrial Acrylic System:
 - 1. S-W DTM Acrylic Semi-Gloss Coating, B66-200 Series, 2.5 – 4 mils dry per coat.
- C. Dryfall Waterborne Finish Coats.
 - 1. S-W ProIndustrial Waterborne Acrylic Dryfall Flat, B42-80 Series.

2.5 FLOOR COATINGS

- A. Interior/Exterior Clear Concrete Floor Sealer (Water Based): MPI #99.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
 - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.
- C. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Wood: 15 percent.
 - 3. Gypsum Board: 12 percent.
- D. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
 - 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 - 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Wood Substrates:
 - 1. Scrape and clean knots and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
 - 6. All door frames shall be spot-primed to prior to receiving finish coats, to cove scratches and abuse incurred during installation.

7. Block fillers shall be applied in thickness indicated, but not less than that required to ACHIEVE A PINHOLE-FREE SURFACE.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. Provide "Wet Paint" signs and other methods to protect newly coated surfaces. Remove when directed or when no longer needed.
- E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

- A. Refer to Finish Schedule for colors and sheens.
- B. Precast Concrete Substrates, Nontraffic Surfaces:
 - 1. Latex System:
 - a. Prime Coat: Latex primer.
 - b. Intermediate Coat: Latex system.
 - c. Topcoat: Latex system.
- C. Concrete Substrates, including housekeeping pads, Traffic Surfaces:
 - 1. Floor Coating:
 - a. One coat: Floor sealer.
- D. Concrete Masonry Substrates, Nontraffic Surfaces:
 - 1. Latex System:
 - a. Prime Coat: Block Filler.
 - b. Intermediate Coat: Latex system.
 - c. Topcoat: Latex system.
- E. Steel Substrates:
 - 1. Light-Industrial Acrylic System:
 - a. Prime Coat: Metal primer, unless shop primed.
 - b. Intermediate Coat: Light-industrial acrylic system.
 - c. Topcoat: Light-industrial acrylic system.
- F. Exposed Steel Structure and Items attached to Exposed Steel Structure:

1. Waterborne Dryfall System:
 - a. First Coat: Waterborne dry-fall.
 - b. Topcoat: Waterborne dry-fall.

- G. Gypsum Board:
 1. Latex System:
 - a. Prime Coat: Latex primer.
 - b. Intermediate Coat: Latex system.
 - c. Topcoat: Latex system.

- H. Cementitious Wood Fiber (Tectum) Panels:
 1. Latex System:
 - a. Intermediate Coat: Latex system.
 - b. Topcoat: Latex system.

- I. Cotton or Canvas Insulation-Covering Substrates: Including pipe and duct coverings.
 1. Latex System:
 - a. Prime Coat: Latex primer.
 - b. Intermediate Coat: Latex system.
 - c. Topcoat: Latex system.

END OF SECTION 099123

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

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. This Section includes surface preparation and the application of wood finishes on the following substrates:
 - 1. Interior Substrates:
 - a. Dressed lumber (finish carpentry).
- B. Related Sections include the following:
 - 1. Division 09 wood flooring Sections for stains and transparent finishes applied to wood flooring.
 - 2. Section 099123 "Interior Painting" for surface preparation and application of standard paint systems on interior substrates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Submit Samples on representative samples of actual wood substrates, 8 inches (200 mm) square.
 - 2. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
 - 1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of MPI's current "MPI Approved Products List" for each product category specified in Part 2, with the product proposed for use highlighted.

1.4 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in its "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and finish systems indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply exterior finishes in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.
2. Diamond Vogel Paints.
3. Glidden Professional.

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4. ICI Paints.
5. Kwal-Howells Paint.
6. PPG Architectural Finishes, Inc.
7. Sherwin-Williams Company (The)

2.2 MATERIALS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each finish system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.

B. VOC Content of Field-Applied Interior Primers, Stains, and Transparent Finishes: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to primers, stains, and transparent finishes that are applied in a fabrication or finishing shop:

1. Flat Primers: VOC content of not more than 50 g/L.
2. Nonflat Primers: VOC content of not more than 150 g/L.
3. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
4. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
5. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
6. Floor Coatings: VOC not more than 100 g/L.
7. Shellacs, Clear: VOC not more than 730 g/L.
8. Stains: VOC not more than 250 g/L.

2.3 WOOD FILLERS

A. Wood Filler Paste: MPI #91.

1. VOC Content: E Range of E2.

2.4 STAINS

A. Interior Wood Stain (Semitransparent): MPI #90.

1. VOC Content: E Range of E2.

2.5 POLYURETHANE FINISHES

A. Interior, Oil-Modified, Clear Urethane (Satin): MPI #57, Gloss Level 4.

1. VOC Content: E Range of E2.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
 1. Maximum Moisture Content of Wood Substrates: 15 percent when measured with an electronic moisture meter.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes.
 3. Begin finish application only after unsatisfactory conditions have been corrected and surfaces are dry.
 4. Beginning application of finish system constitutes Contractor's acceptance of substrate and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be finished. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 1. After completing finishing operations, reinstall items that were removed; use workers skilled in the trades involved. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.
 1. Remove surface dirt, oil, or grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
 3. Countersink steel nails, if used, and fill with putty tinted to final color to eliminate rust leach stains.
- D. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for finish and substrate indicated.
 - 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Finish Carpentry Substrates:
 - 1. Polyurethane Varnish Over Stain System: MPI INT 6.3E.
 - a. Stain Coat: Interior wood stain (semitransparent).
 - b. Two Finish Coats: Interior, oil-modified, clear urethane (satin).

END OF SECTION 099300

SECTION 099600 - HIGH-PERFORMANCE COATINGS

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 surface preparation and application of high-performance coating systems on the following substrates:
 - 1. Interior Substrates:
 - a. Concrete masonry units (CMU).
 - b. Gypsum board.
 - c. Precast concrete.
- B. Related Requirements:
 - 1. Division 09 painting Sections for special-use coatings and general field painting.

1.3 DEFINITIONS

- A. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- B. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.
- B. Samples for Verification: For each type of coating system and in each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
3. VOC content.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Coatings: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied, in un-opened containers.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Lee's Summit design and construction staff will not be in a position to recommend award of a contract to teams which include Norco Painting.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Sherwin-Williams Company (The).
 - 2. No substitutions.
- B. Products: Subject to compliance with requirements, provide product listed in other Part 2 articles for the paint category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and are listed in "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a coating system, provide products recommended in writing by manufacturers of topcoat for use in coating system and on substrate indicated.
 - 3. Provide products of same manufacturer for each coat in a coating system.
- C. Colors: As indicated in Division 09 Section "Interior Painting" and as indicated on a color schedule with a prefix "EP".

2.3 BLOCK FILLERS

- A. Block Filler, Latex, Interior/Exterior:
 - 1. S-W PrepRite Block Filler, B25W25

2.4 INTERIOR PRIMERS/SEALERS

- A. Primer Sealer, Latex, Interior Precast Concrete:
 - 1. S-W Loxon Concrete & Masonry Primer.
- B. Primer Sealer, Latex, Interior Gypsum Board:
 - 1. S-W ProMar 200 Zero VOC Latex Primer.

2.5 EPOXY COATINGS

- A. Waterborne epoxy:
 - 1. S-W Pro Industrial Waterbased Catalyzed Epoxy K46 series, Semi-Gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Masonry (Clay and CMU): 12 percent.
 - b. Gypsum Board: 12 percent.
- B. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

- D. Masonry Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.
 - 1. Block fillers shall be applied in thickness indicated but not less than TO ACHIEVE A PINHOLE-FREE SURFACE.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
 - 1. Contractor shall touch up and restore coated surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. CMU Substrates:

1. Epoxy System:

- a. Block Filler: Block filler, Latex, Interior/exterior, 75 to 125 sq ft/gal, but not less than that required to achieve a pinhole-free surface.
- b. Intermediate Coat: Waterborne epoxy, 4 mils wet, 1.5 dry mils.
- c. Topcoat: Waterborne epoxy, 4 mils wet, 1.5 dry mils.

B. Precast Concrete Substrates:

1. Epoxy System:

- a. Primer Sealer, Latex, Interior, Precast Concrete, 50 to 100 sq ft/gallon.
- b. Intermediate Coat: Waterborne epoxy, 4 mils wet, 1.5 dry mils.
- c. Topcoat: Waterborne epoxy, 4 mils wet, 1.5 dry mils.

C. Gypsum Board Substrates:

1. Epoxy System:

- a. Prime Coat: Primer sealer, latex, Interior Gypsum Board, 4 mils wet, 1.5 dry mils.
- b. Intermediate Coat: Waterborne epoxy, 4 mils wet, 1.5 dry mils.
- c. Topcoat: Waterborne epoxy, 4 mils wet, 1.5 dry mils.

END OF SECTION 099600

SECTION 101100 - VISUAL DISPLAY SURFACES

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. Markerboards.

1.3 DEFINITIONS

- A. Tackboard: Framed, tackable, visual display board assembly.
- B. Visual Display Board Assembly: Visual display surface that is factory fabricated into composite panel form, either with or without a perimeter frame; includes chalkboards, markerboards, and tackboards.
- C. Visual Display Surface: Surfaces that are used to convey information visually, including surfaces of markerboards, tackboards, and surfacing materials that are not fabricated into composite panel form but are applied directly to walls.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for visual display surfaces.
- B. Shop Drawings: For visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of panel joints.
 - 2. Show locations of special-purpose graphics for visual display surfaces.
 - 3. Include sections of typical trim members.
- C. Samples for Verification: For each type of visual display surface indicated.

1. Visual Display Surface: Not less than 8-1/2 by 11 inches (215 by 280 mm), mounted on substrate indicated for final Work. Include one panel for each type, color, and texture required.

D. Maintenance Data: For visual display surfaces to include in maintenance manuals.

E. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-built visual display surfaces, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site.

B. Store visual display surfaces vertically with packing materials between each unit.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display surfaces until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.

1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

1.8 WARRANTY

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Surfaces lose original writing and erasing qualities.
 - b. Surfaces exhibit crazing, cracking, or flaking.
 2. Warranty Period: Life of the building.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Porcelain-Enamel Face Sheet: Porcelain-enamel-clad, ASTM A 463/A 463M, Type 1, stretcher-leveled aluminized steel, with 0.024-inch (0.60-mm) uncoated thickness; with porcelain-enamel coating fused to steel at approximately 1000 deg F (538 deg C).
1. Gloss Finish: Low reflective; dry-erase markers wipe clean with dry cloth or standard eraser. Suitable for use as projection screen.
- B. Particleboard: ANSI A208.1, Grade M-1, made with binder containing no urea formaldehyde.
- C. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063.

2.2 MARKERBOARD ASSEMBLIES (MBD)

- A. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 0.021-inch (0.53-mm-) thick, porcelain-enamel face sheet with low-glare finish.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. AARCO Products, Inc.
 - b. Best-Rite Manufacturing.
 - c. Claridge Products and Equipment, Inc.
 - d. Ghent Manufacturing Inc.
 - e. Marsh Industries, Inc.; Visual Products Group.
 - f. Platinum Visual Systems; a division of ABC School Equipment, Inc.
 - g. PolyVision Corporation; a Steelcase company.

2. Basis-of-Design Product: Subject to compliance with requirements, provide Claridge Products and Equipment, Inc.; LCS Markerboard.
 3. Particleboard Core: 1/2 inch (13 mm) thick; with 0.015-inch- (0.38-mm-) thick, aluminum sheet backing.
 4. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.
- B. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- (1.57-mm-) thick, extruded aluminum; standard size and shape.
1. Factory-Applied Trim: Manufacturer's standard.
- C. Chalktray: Manufacturer's standard, continuous (locations without chalktrays include Gyms, Lifeskills, SEB, Focus, and ISS)
1. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.
- D. Map Rail: Provide the following accessories:
1. Display Rail: Continuous and integral with map rail; fabricated from cork approximately 1 to 2 inches (25 to 50 mm) wide with (2) map clips.
 2. End Stops: Located at each end of map rail.
- E. Flag Holder.
- F. Markerboards with Permanently Printed Music Staff Lines as noted on plans.

2.3 FABRICATION

- A. Porcelain-Enamel Visual Display Assemblies: Laminate porcelain-enamel face sheet and backing sheet to core material under heat and pressure with manufacturer's standard flexible, waterproof adhesive.
- B. Visual Display Boards: Factory assemble visual display boards unless otherwise indicated.
1. Where factory-applied trim is indicated, trim shall be assembled and attached to visual display boards at manufacturer's factory before shipment.
- C. Factory-Assembled Visual Display Units: All visual display units to be individually framed, unless noted to be frameless.
- D. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.
1. Where factory-applied trim is indicated, trim shall be assembled and attached to visual display units at manufacturer's factory before shipment.

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 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.

2.5 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

2.6 VISUAL DISPLAY SURFACE SCHEDULE

- A. Visual Display Board (MBD): Factory assembled.
 - 1. Markerboard: Porcelain-enamel markerboard assembly.
 - a. Color: Manufacturer's standard white for a low-glare finish.
 - 2. Corners: Square.
 - 3. Width: As indicated on Drawings.
 - 4. Height: 4'-0".
 - 5. Mounting: Wall.
 - 6. Factory-Applied Aluminum Trim: Manufacturer's standard with clear anodic finish.
 - 7. Accessories:
 - a. Chalktray: Solid type.
 - b. Map rail with display rail, end stops and flag holder.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motor-operated, sliding visual display units.
- C. Examine walls and partitions for proper preparation and backing for visual display surfaces.

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- D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.
- C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display surfaces and wall surfaces.

3.3 INSTALLATION, GENERAL

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
 - 1. Mounting Height for Grades 6 through 8: Verify with Owner.

3.4 INSTALLATION OF FACTORY-FABRICATED VISUAL DISPLAY BOARDS AND ASSEMBLIES

- A. Visual Display Boards: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with fasteners at not more than 16 inches (400 mm) o.c. Secure both top and bottom of boards to walls.
 - 1. Field-Applied Aluminum Trim: Attach trim over edges of visual display boards and conceal grounds and clips. Attach trim to boards with fasteners at not more than 24 inches (610 mm) o.c. Do not use adhesives or mastic for installation.
 - a. Attach chalktrays to boards with fasteners at not more than 12 inches (300 mm) o.c.

3.5 CLEANING AND PROTECTION

- A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.

- C. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION 101100

SECTION 101416 - PLAQUES

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 a dedication plaque.

1.3 DEFINITIONS

- A. Accessible: In accordance with the accessibility standard.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For plaques.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show plaque mounting heights, locations of supplementary supports to be provided by others, and accessories.
 - 3. Show message list, typestyles, graphic elements, and layout for each plaque at least half size.
- C. Sample Warranty: For special warranty.

1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

2.2 PLAQUES

- A. Cast Plaque: Plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Manufacturer: Subject to compliance with requirements, provide product by one of the following:
 - a. Ace Sign Systems, Inc.
 - b. Allen Markings International.
 - c. APCO Graphics, Inc.
 - d. A. R. K. Ramos Signage Systems.
 - e. Diskey Sign Company.
 - f. Erie Landmark Company; Division of Paul W. Zimmerman Foundries.
 - g. Gemini Incorporated.
 - h. Matthews International Corporation; Bronze Division.
 - i. Metal Arts; Division of L & H Mfg. Co.
 - j. Metallic Arts.
 - k. Nelson-Harkins Industries.
 - l. Southwell Company (The).
 2. Plaque Material: Cast aluminum.
 3. Plaque Thickness: 0.50 inch (12.7 mm).
 4. Size: 18 inches by 22 inches.
 5. Finishes:
 - a. Integral Aluminum Finish: Medium bronze anodized finish to be lacquered for protection.
 6. Background Texture: Leatherette.
 7. Integrally Cast Border Style: Single line border with beveled edge.
 8. Mounting: Concealed studs.
 9. Text and Typeface: Satin finish letters and textured background. Letter style to be selected by the Architect from manufacturer's full range of styles. Lettering layout to be provided by the Architect at shop drawing stage.

2.3 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M, alloy and temper recommended by plaque manufacturer for casting process used and for type of use and finish indicated.

2.4 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
1. Use concealed fasteners and anchors unless indicated to be exposed.
 2. For exterior exposure, furnish nonferrous-metal, stainless-steel or hot-dip galvanized devices unless otherwise indicated.
 3. Plaque Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque, unless otherwise indicated.

2.5 FABRICATION

- A. General: Provide manufacturer's standard plaques according to requirements indicated.
1. Preassemble plaques in the shop to greatest extent possible. Disassemble plaques only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 5. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.
 6. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

2.6 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

- B. 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.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
- D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.7 ALUMINUM FINISHES

- A. Medium Bronze Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of plaque work.
- B. Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
 - 2. Install plaques so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.
 - 4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Mounting Methods:
 - 1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.

- a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.
- b. Thin or Hollow Surfaces: Place plaque in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as plaques are installed.
- C. On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101416

SECTION 101419 – DIMENSIONAL LETTER SIGNAGE

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. This Section includes the following:
 - 1. Cast dimensional characters for exterior signage.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
 - 1. Provide message list for each sign, including large-scale details of wording, lettering, and artwork.
- C. Samples for Verification: For each type of sign, include the following Samples to verify color selected:
 - 1. Dimensional Characters: Full-size Samples of each type of dimensional character (letter and number) required. Show character style, material, finish, and method of attachment.
- D. Qualification Data: For Installer.
- E. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.5 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.
 - 1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DIMENSIONAL CHARACTERS

- A. Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
 - 1. American Graphics Inc.
 - 2. A.R.K. Ramos.
 - 3. ASI Sign Systems, Inc.
 - 4. Gemini Incorporated.
 - 5. Metal Arts; Div. of L&H Mfg.
 - 6. Metallic Arts, Inc.
 - 7. Signature Sign Signs, Inc.
 - 8. Southwell Co. (The).
 - 9. Vomar Products, Inc.
- B. Cast Characters: Characters with uniform faces; sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Character Material: Cast aluminum.
 - 2. Character Height: 18-inches, unless otherwise indicated.
 - 3. Thickness: Manufacturer's standard for size of character.
 - 4. Finishes:
 - a. Anodized finish: Black.

5. Mounting:
 - a. Projecting studs that are concealed and to provide 1-inch space between back of characters and substrate.
6. Typeface: Arial as indicated on the Drawings.

2.2 FINISHES, GENERAL

- 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 from damage by applying strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within 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 and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- B. Dimensional Characters: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition

of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.

1. Projecting studs at exterior: 1-inch projection from substrate.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 101419

SECTION 101423 – PANEL SIGNAGE

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. Manufactured panel signage.
 - 2. Custom die cut vinyl graphics and signage.

1.3 DEFINITIONS

- A. Accessible: In accordance with the accessibility standard.

1.4 COORDINATION

- A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.
- B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacture agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metal finishes beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify locations of anchorage embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PANEL SIGNS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Mark II; Vista System.
- B. Interior Panel Signs: Provide modular curved frame, complying with the following requirements:
 1. Extruded aluminum with clear anodized finish.
 2. Laminated, Etched Photopolymer: Raised graphics with Braille 1/32 inch (0.8 mm) above surface with contrasting colors in finishes and color combinations indicated and laminated to acrylic back.
 3. Edge Condition: Manufacturer's standard.
 4. Corner Condition: Manufacturer's standard.
 5. Mounting: Framed, as indicated.
 - a. Wall mounted with two-face tape and silicone adhesive.
 - b. Manufacturer's standard anchors for substrates encountered.
 6. Color: Match Architect's sample.
 7. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.
 - a. Color: Charcoal.
- C. Brackets: Fabricate brackets and fittings for bracket-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching Architect's sample.
- D. Panel Sign Frames:
 1. Extruded-Aluminum Frames: With concealed anchors.
 - a. Product: Subject to compliance with requirements, provide Vista Signs; V200-WFP42.

- 1) Color: Clear anodized aluminum with gray molded plastic end caps.
 - 2) Size: 7.87 inches wide by 5 inches high.
 - 3) Profile: Curved.
 - 4) Corner Condition: Square.
 - 5) Mounting: As indicated.
 - a) Wall mounted with two-face tape and silicone adhesive.
- b. Product: Subject to compliance with requirements, provide Vista Signs; V150-WFP33.
- 1) Color: Clear anodized aluminum with gray molded plastic end caps.
 - 2) Size: 5.90 inches wide by 8 inches high.
 - 3) Profile: Curved.
 - 4) Corner Condition: Curved.
 - 5) Mounting: As indicated.
 - a) Wall mounted with two-face tape and silicone adhesive.
- E. Changeable Message Inserts: Fabricate signs to allow insertion of changeable messages in the form of paper inserts.
- F. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.
1. Panel Material: Photopolymer.
 2. Raised-Copy Thickness: Not less than 1/32 inch (0.8 mm).
- G. Colored Coatings for Photopolymer Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by photo polymer manufacturers for optimum adherence to acrylic surface and are UV and water resistant for five years for application intended.
1. Color: Match Architect's sample.
- H. Panel Sign Schedule: See Drawings.
1. Sign Size: As indicated.
 2. Message Panel Material: As indicated.
 3. Final room numbering is subject to Owner review and approval, and shall provide numbering continuity through the building.
 4. Message Panel Finish/Color: As selected by the Architect from manufacturer's full range of colors.
 5. Background Finish/Color: As selected by the Architect from manufacturer's full range of colors.
 6. Character Finish/Color: As selected by the Architect from manufacturer's full range of colors.

2.2 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 - 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 - 3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 - 4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 - 5. Internally brace signs for stability and for securing fasteners.
 - 6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
- B. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:
 - 1. For snap-in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. [Subsequent changeable inserts are by Owner.

2.3 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. 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.
- C. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.4 CUSTOM DIE CUT VINYL GRAPHICS AND SIGNAGE

- A. Field applied vinyl character signage
- B. Minimum 3.5 mil thickness
- C. UV resistant pressure sensitive with permanent adhesive. Die cut to form characters and images as indicated.

- D. Colors as approved by Architect and Owner.
- E. Custom Font as indicated by owner. Provide all licenses for use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
 - 4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Mounting Methods:
 - 1. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.
 - b. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.
 - 2. Shim-Plate Mounting: Provide 1/8-inch- thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other direct mounting

methods are impractical. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach signs to plate using <Insert mounting method> method specified above.

3. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
 4. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.
- C. Signs Mounted on Glass: Provide opaque aluminum sheet matching sign material and finish, in size matching sign, onto opposite side of glass to conceal back of sign.
- D. Field-Applied, Vinyl-Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages, and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fish-mouths. Remove carrier film without disturbing applied vinyl film.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

SECTION 101426 – MONUMENT SIGNAGE

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. This Section includes the following:
 - 1. Internally illuminated panel signs.
 - 2. Electronic messaging centers.
- B. Related Sections include the following:
 - 1. Section 033000 "Cast-in-Place Concrete" for concrete foundations.
 - 2. Section 042000 "Unit Masonry" for the masonry unit base.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide panel and pylon signs capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Basic Wind Speed, $V = 120$ mph.
 - b. Category II.
 - c. Exposure C.
- B. Thermal Movements: Provide panel and pylon signs that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.4 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for pylon signage.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Provide message list, typestyles, graphic elements, and layout for each sign at least half size and full-size details of graphics.
 - 3. Show locations of electrical service connections.
 - 4. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation and licensed in the State of Missouri.
 - 5. LED display.
 - 6. LED riser diagram.
 - 7. AC site power requirements, including legs and Amps per leg.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
 - 1. Aluminum.
- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
 - 1. Aluminum: For each form, finish, and color, on 6-inch- (150-mm-) long sections of extrusions and squares of sheet at least 4 by 4 inches (100 by 100 mm).
 - 2. Frame: 6-inch- (150-mm)- long sections of each profile.
 - 3. Accessories: Manufacturer's full-size unit.
- E. Sign Schedule: Use same designations indicated on Drawings.
- F. Qualification Data: For Installer and fabricator.
- G. Warranty: Special warranty specified in this Section.
- H. Maintenance Data: For signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- D. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ICC A117.1, 2012 IBC, and 2011 NEC.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Indicate measurements on Shop Drawings.

1.8 COORDINATION

- A. Coordinate installation of anchorages for post and panel/pylon signage. Furnish setting drawings, templates, and directions for installing anchorages and other items that are to be embedded in concrete.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of panel and pylon signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of metal finishes beyond normal weathering.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.
- B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 6063-T5.
- C. Steel:
 - 1. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating, either commercial or forming steel.
 - 2. Hot-Rolled Structural-Steel Shapes: ASTM A 36/A 36M or ASTM A 529/A 529M.
 - 3. Steel Tubing or Pipe: ASTM A 500, Grade B.
 - 4. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or ASTM A 572/A 572M, 42,000-psi (290-MPa) minimum yield strength.
 - 5. Bolts for Steel Framing: ASTM A 307 or ASTM A 325 (ASTM A 325M) as necessary for design loads and connection details.
 - 6. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 PANEL SIGNS

- A. Approved Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - 1. Daktronics.
 - 2. Grandwell Industries.
 - 3. Watchfire Signs.
- B. General: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner.
 - 1. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.
 - 2. Increase metal thickness or reinforce with concealed stiffeners or backing materials as needed to produce surfaces without distortion, buckles, warp, or other surface deformations.
 - 3. Continuously weld joints and seams unless other methods are indicated; grind, fill, and dress welds to produce smooth, flush, exposed surfaces with welds invisible after final finishing.

- C. Internally Illuminated Panel Signs: Frame message panel with formed aluminum sheet or extruded hollow-box-type frame with ends flanged to engage slots in posts or attached to posts with extruded-aluminum fittings. Close top and bottom edges of panels with manufacturer's standard welded seams or extrusions.
1. Hollow-Box Size: As indicated on Drawings by manufacturer's standard depth.
 - a. Corner Condition: Square.
 2. Mounting: Within the pylon structure.
 - a. Manufacturer's standard noncorroding anchors for substrates encountered.
 - b. Provide clips welded to back of panels for installation without visible fasteners.
 3. Illuminated-Sign Units: Manufacturer's standard LED lighting including transformers, insulators, and other components. Make provisions for servicing and concealing connections to building electrical system.
 4. Face Material: Manufacturer's standard white polycarbonate sheet facing for school name and address to be illuminated when backlit.
 5. Graphics: Provide Manufacturer's standard graphics for sign lettering and logo. Allow for logo to be added to sign faces per artwork to be furnished by Owner.
- D. Electronic Message Centers:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Daktronics; Galaxy GS6 Series 15.85mm full color message display with 2-Viewing sides series, and as follows:
 - a. Cabinet dimensions shall not exceed dimensions indicated on drawings.
 - b. Character Height: 4.4 inches or larger.
 - c. Cabinets shall contain a full LED matrix for medium to high resolution to fit within the specified view area.
 - d. View Area: Minimum 2'-1" by 6'-6"
 - e. Line Spacing: 15.85 mm color.
 - f. Pixel Configuration: 1-red, 1-green, 1-blue.
 - g. Maximum Brightness: 12,000 nits.
 - h. Whole Sign Color Calibration: Standard.
 - i. Display Dimming: 64-levels (auto, scheduled, or manual control).
 - j. Two-View (2V), two one-sided displays typically installed back-to-back and show same content on both sides.
 - k. Maximum display power per face shall not exceed 360 watts when 100% of the pixels are operating at their maximum possible drive current.
 - l. Cabinets weight per face shall not exceed 100 lbs./45.5 kg.
 - m. Message Capability: Text, graphics, logos, basis animation, video clips, multiple font styles, and sizes.
 - n. Estimated LED Lifetime: 100,000 hours.
 - o. Control Software: Daktronics; Venus Control Suite.
 - p. Communication: Wireless Ethernet Bridge.
 - q. Corner Condition: Square.

- r. UL 48 and CUL 48 listed and FCC compliant and UL Energy Efficient Certified.

2.3 CONNECTIONS AND CONTROL

- A. Power: Input Voltage: 120/240 VAC single phase.
- B. Power Control: Continuous power to electronic messaging centers (control via software), switched power for backlit portion.
- C. Electronic messaging centers: Provide software installed on Owner-furnished PC for control and programming of electronic messaging centers. Signal transmission shall be via wireless transmitter located on roof of existing school in location to be coordinated with Owner, with wireless receiver located at sign. Provide preliminary RF testing to ensure adequate signal strength and properly size transmitter. Provide all components for connection to Owner's Local Area Network (LAN).

2.4 ACCESSORIES

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- B. Sheet Metal: Provide aluminum shroud and flashings as indicated and to provide a weathertight enclosure. Finish to match sign cabinets/housings.
- C. Sealants: Silicone sealant as recommended by sign manufacturer.

2.5 FABRICATION

- A. General: Provide manufacturer's standard pylon signs of configurations indicated.
 - 1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
 - 2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
 - 3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
 - 4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.6 FINISHES, GENERAL

- 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 from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

- A. Basis-of-Design Product: Martin Senour; PRISM 65 Series, automotive-grade acrylic urethane paint, or equal.
 - 1. Color: As selected by the Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts and electrical power are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Excavation: Excavate for sign foundation to elevations and dimensions indicated. Reconstruct subgrade that is not firm, undisturbed, or compacted soil, or that is damaged by freezing temperatures, frost, rain, accumulated water, or construction activities by excavating a further 12 inches (300 mm), backfilling with satisfactory soil, and compacting to original subgrade elevation.
 - 1. Excavate hole depths as indicated unless otherwise required per Shop Drawings.
- B. Set anchor bolts and other embedded items required for installation of signs. Use templates furnished by suppliers of items to be attached.

- C. Install signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.
 - 3. Install sheet metal shroud, flashings, and sealants as indicated and required to provide a weatherproof assembly.

- D. Signs to be grounded according to manufacturer's installation instructions and the provisions outlined in Article 250 of the National Electrical Code. The displays must be connected to earth-ground. Proper grounding is necessary for reliable equipment operation and protects the equipment from damaging electrical disturbances and lightning.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

- B. Touch up damaged finishes with paint to match factory-finish.

END OF SECTION 101426

SECTION 102113 - TOILET COMPARTMENTS

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. This Section includes solid-polymer units as follows:
 - 1. Toilet Enclosures: Overhead braced.
 - 2. Urinal Screens: Wall hung.
- B. Related Sections include the following:
 - 1. Section 061000 "Rough Carpentry" for blocking.
 - 2. Section 102800 "Toilet, Bath and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of cutouts for compartment-mounted toilet accessories.

1.4 QUALITY ASSURANCE

- A. Comply with requirements in CID-A-A-60003, "Partitions, Toilets, Complete."
- B. Must provide 15-year warranty on all partitions.

1.5 WARRANTY

- A. Warrant panels and factory hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal wear and tear.

1. Standard Period: Fifteen (15) years starting on date of shipment.
2. Limited Lifetime Period: Covering failure of joinery, core deterioration, and delamination or bubbling of panel skin and corrosion of all fiberglass products while the panel is in its original installation.
3. Anodized Aluminum Finish Period: Ten (10) years.

1.6 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 TOILET PARTITIONS AND SCREENS

- A. Products: Subject to compliance with requirements, provide the following:
 1. Special-Lite, Inc.; FRP/Aluminum Toilet Partitions and Screens.
- B. Door, Panel, and Pilaster Construction:
 1. Panel Thickness: 1-1/4 inches.
 2. Aluminum Perimeter Channel:
 - a. Aluminum extrusions made from 6063 aluminum alloys with a minimum temper of T5.
 - b. Minimum 1-3/4 inches deep, one-piece extrusion with integral reglet to accept face sheet on both interior and exterior sides of panel which secure face sheet into place and permit flush appearance. Use of adhesive to bond face sheet to core or extrusions is not acceptable.
 - c. Screw or snap in place applied caps are not acceptable.
- C. Corners: Mitered and mechanically-fastened.
- D. Core: Poured-in-place polyurethane foam. Laid-in foam cores are not acceptable.
- E. Face Sheet: 0.120-inch thick, pebble texture, through-color with SpecLite 3 integral surfaseal film FRP sheet, with Class A flame spread rating.
 1. Color: Black.
- F. Pilaster Shoes: 4 inches high clear anodized aluminum.
- G. No pilaster greater than 6 inches is acceptable.

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2.2 ACCESSORIES

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories, and as indicated in 2.3.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Torx type of stainless steel, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

2.3 FABRICATION

- A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions. Make provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.
- B. Doors: Unless otherwise indicated, provide 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be accessible to people with disabilities.
 - 1. Hinges: Full-height gravity-activated continuous type with cover.
 - 2. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities. Latches to be through-bolted to doors.
 - 3. All wall brackets shall be continuous stainless steel
 - 4. All fasteners shall be torx type, stainless steel.
 - 5. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories. Provide only on backs of doors in publicly-accessible toilet rooms.
 - 6. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
 - 7. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with accessibility requirements of authorities having jurisdiction. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
1. Maximum Clearances:
 - a. Pilasters and Panels: 1/2 inch (13 mm).
 - b. Panels and Walls: 1 inch (25 mm).
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Secure continuous head rail to each pilaster with not less than two fasteners. Hang doors to align tops of doors with tops of panels and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
1. Panels to be through-bolted to brackets.
- C. Wall-Hung Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb and to resist lateral impact.
1. Panels to be through-bolted to brackets.

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 102113

SECTION 102123 – CUBICLE CURTAINS AND TRACK

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. This Section includes the following:
 - 1. Cubicle curtain tracks and carriers.
 - 2. Cubicle curtains.
- B. Related Sections:
 - 1. Section 061053 "Miscellaneous Rough Carpentry" contains requirements for blocking for mounting tracks, curtain tiebacks, wall brackets, and other items requiring anchorage.

1.3 SUBMITTALS

- A. Submit each item in this Article according to the Conditions of the Contract and Division 01 Specification Sections.
- B. Product Data including durability, fade resistance, and fire-test-response characteristics for each type of curtain fabric specified.
- C. Shop Drawings showing layout and types of cubicles, size of curtains, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions taken from field measurements.
- D. Coordination Drawings for reflected ceiling plans drawn accurately to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Ceiling suspension assembly members.
 - 2. Method of attaching cubicle curtain track hangers to building structure.
 - 3. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
- E. Samples for initial selection in the form of manufacturer's color charts for each type of curtain fabric indicated.

- F. Samples for verification of the following products, showing the full range of color, texture, and pattern variations expected.
 - 1. Curtain Fabric: 12-inch- (300-mm-) square swatch from dye lot used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of material.
 - 2. Mesh Fabric: Manufacturer's standard-size unit, not less than 4 inches (100 mm) square.
- G. Product certificates signed by manufacturers of cubicle tracks and curtains certifying that their products comply with specified requirements.
- H. Maintenance data for cubicle tracks and curtains to include in the operation and maintenance manual specified in Division 01.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements. Verify that tracks and curtains may be installed to comply with the original design and referenced standard.
- B. Space Enclosure and Environmental Limitations: Do not install tracks and curtains until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, and work above ceilings is complete.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide cubicles by one of the following:
 - 1. ADC Hospital Equipment.
 - 2. Creative Healthcare Products, Inc. (Clickeze).
 - 3. General Cubicle Co.
 - 4. Imperial Fastener Co.
 - 5. Kirsch Co.
 - 6. Nelson: A.R. Nelson Co., Inc.
 - 7. Pryor Products.
 - 8. Salisbury Industries.

2.2 CUBICLE CURTAIN FABRIC

- A. Curtain Material: Provide the following:
 - 1. Manufacturer: Maharam

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- a. Pattern: Convene 511494/005 Wade.
- b. Fiber Content: 82% FR Polyester, 18% Post-Industrial Recycled Polyester.
- c. Width: 72 inches.
- d. Material Application: Up the bolt.
- e. Equivalent Manufacturers: No substitutions.

2.3 CUBICLE TRACK

- A. Track: Anodized, extruded aluminum.
 1. Curved Track: Factory fabricated, not less than 12-inch- (300-mm-) radius bends.
 2. Splicing Clamp: Of same material and finish as track.
- B. Track Mounting: Ceiling mounted; mechanically fastened to suspended ceiling grid.
 1. Exposed Fasteners: Stainless steel.
 2. Concealed Fasteners: Stainless steel.
- C. Track Accessories: Provide end caps, connectors, end stops, coupling sleeves, wall brackets, and other accessories as required for secure and operational installation. Provide a quantity of carriers for 6-inch (150-mm) spacing the full length of the curtain plus one additional carrier.
 1. Carriers: One-piece nylon glide with chrome-plated steel hook.

2.4 CUBICLE CURTAINS

- A. Fabric: Provide cubicle curtain fabrics with the following characteristics:
 1. Fabrics are launderable to a temperature of not less than 160 deg F (71 deg C).
 2. Fabrics are flame resistant and are identical to those that have passed NFPA 701 when tested by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify fabrics with appropriate markings of applicable testing and inspecting agency.
- B. Curtain Top: Not less than 20-inch- (510-mm-) wide nylon mesh with 1/2-inch- (13-mm-) holes. Overlap seams and double-lock stitch to body of curtain.
- C. Provide curtains fabricated to comply with the following requirements:
 1. Width: Equal to track length from which curtain is hung plus 10 percent, but not less than 12 inches (300 mm).
 2. Length: Equal to floor-to-ceiling height minus 18 inches (460 mm) from finished ceiling at top and 12 inches (300 mm) above finished floor.
 3. Top Hem: Not less than 1 inch (25 mm) and not more than 1-1/2 inches (40 mm) wide, triple thickness, reinforced with integral web, and double stitched.

- a. Grommets: Two-piece, rolled-edge, rustproof, nickel-plated brass and spaced not more than 6 inches (150 mm) on center
4. Bottom and Side Hems: Not less than 1 inch (25 mm) wide, reinforced, triple thickness, and single stitched.
5. Seams: Not less than 1/2 inch (13 mm) wide, double turned and double stitched.
- D. Curtain Drop: Beaded chain with aluminum hook.
- E. Curtain Tieback: At each termination.
- F. Operating Wand: Fiberglass baton, not less than 30 inches (762 mm) long.
- G. Cubicle Curtain Fabrics: Subject to compliance with requirements, provide one of the products specified in each cubicle curtain fabric Product Data sheet at end of this Section.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine ceilings for suitable conditions where cubicle track is to be installed.
- B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install cubicle curtain track level and plumb, according to manufacturer's written instructions and original design.
- B. Install ceiling-mounted tracks at intervals of not less than 24 inches (610 mm).
- C. Center fastener in track to insure unencumbered carrier operation.

3.3 PROTECTION

- A. Protect installed track opening with a nonresidue adhesive tape to prevent debris from the ceiling finishing operation from impeding carrier operation.

END OF SECTION 102123

SECTION 102239 - FOLDING PANEL PARTITIONS

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. Manually operated, acoustical panel partitions.

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for supports that attach supporting tracks to overhead structural system.
 - 2. Section 092900 "Gypsum Board" for fire-rated assemblies and sound barrier construction above the ceiling at track.

1.3 DEFINITIONS

- A. NIC: Noise Isolation Class.
- B. NRC: Noise Reduction Coefficient.
- C. STC: Sound Transmission Class.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For operable panel partitions.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
- C. Samples for Initial Selection: For each type of exposed material, finish, covering, or facing.
 - 1. Include Samples of accessories involving color selection.

- D. Samples for Verification: For each type of exposed material, finish, covering, or facing, prepared on Samples of size indicated below:
1. Textile Facing Material: Full width by not less than 36-inch-(914-mm-) long section of carpet from dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat.
 2. Panel Facing Material: Manufacturer's standard-size unit, not less than 3 inches (75 mm) square.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Partition track, track supports and bracing, switches, turning space, and storage layout.
 2. Suspended ceiling components.
 3. Structural members to which suspension systems are attached.
 4. Size and location of initial access modules for acoustical tile.
 5. Items penetrating finished ceiling, including the following:
 - a. Lighting fixtures.
 - b. HVAC ductwork, outlets, and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Smoke detectors.
 6. Plenum acoustical barriers.
- B. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.
- C. Qualification Data: For qualified Installer and testing agency.
- D. Product Certificates: For each type of operable panel partition.
1. Include approval letter signed by manufacturer acknowledging Owner-furnished panel facing material complies with requirements.
- E. Product Test Reports: For each operable panel partition, for tests performed by a qualified testing agency.
- F. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For operable panel partitions to include in maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
 - b. Seals, hardware, track, track switches, carriers, and other operating components.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Panel Finish-Facing Material: Furnish full width in quantity to cover both sides of two panels when installed.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Faulty operation of operable panel partitions.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal use.
 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:

1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E 90, determined by ASTM E 413, and rated for not less than the STC indicated.
2. Noise-Reduction Requirements: Operable panel partition assembly, identical to partition tested for STC, tested for sound-absorption performance according to ASTM C 423, and rated for not less than the NRC indicated.
3. Noise-Isolation Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E 336, determined by ASTM E 413, and rated for not more than 10 rating points less than STC value indicated.

2.2 OPERABLE ACOUSTICAL PANELS

- A. Operable Acoustical Panels: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Modernfold, Inc.; Acousti-Seal Series 631/632, or comparable product by one of the following:
 - a. Hufcor, Inc.
 - b. Panelfold Inc.
- B. Panel Operation: Manually operated, paired or individual panels, as indicated on the Drawings.
- C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
 1. Panel Width: Equal widths.
- E. STC: Not less than 51.
- F. Panel Weight: 10 lb/sq. ft. (50 kg/sq. m) maximum.
- G. Panel Thickness: Not less than 3 inches (75 mm).
- H. Panel Closure: Manufacturer's standard unless otherwise indicated.
- I. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.
 1. Hinges: Concealed (invisible).

2.3 SEALS

- A. General: Provide seals that produce operable panel partitions complying with performance requirements and the following:
1. Manufacturer's standard seals unless otherwise indicated.
 2. Seals made from materials and in profiles that minimize sound leakage.
 3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
- B. Horizontal Top Seals: Panels shall have manually-operable top and bottom seals operated by wrench inserted in edge of panel to extend seals.

2.4 PANEL FINISH FACINGS

- A. General: Provide finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
1. Apply one-piece, seamless facings free of air bubbles, wrinkles, blisters, and other defects, with invisible seams complying with Shop Drawings for location, and with no gaps or overlaps. Horizontal seams are not permitted. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
 2. Where facings with directional or repeating patterns or directional weave are indicated, mark facing top and attach facing in same direction.
 3. Match facing pattern 72 inches (1830 mm) above finished floor.
- B. Fabric Wall Covering:
1. Product: Subject to compliance with requirements, provide Carnegie Fabrics; Xorel; Flux 6557 Color: TBD.
- C. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.

2.5 SUSPENSION SYSTEMS

- A. Tracks: Steel or aluminum with adjustable steel hanger rods for overhead support, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch (2.54 mm) between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

1. Panel Guide: Aluminum guide on both sides of the track to facilitate straightening of the panels; finished with factory-applied, decorative, protective finish.
 2. Head Closure Trim: As required for acoustical performance; with factory-applied, decorative, protective finish.
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.
- D. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

2.6 ACCESSORIES

- A. Pass Doors: Swinging door built into and matching panel materials, finish and thickness, complete with frames and operating hardware. Hinges finished to match other exposed hardware.
1. Accessibility Standard: Fabricate doors to comply with applicable provisions in ICC A117.1 and the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities.
 2. Single Pass Door: 36 by 80 inches (914 by 2032 mm).
 3. Pass-Door Hardware: Equip pass door with the following:
 - a. Door Seals: Sweep floor seals.
 - b. Panic hardware.
 - c. Concealed door closer.
 - d. Exit Sign: Recessed, self-illuminated.
 - e. Latchset: Passage set.
 - f. Lock: Key-operated lock with cylinder, keyed to master key system, operable from both sides of door. Include two keys per lock.
 - g. Lock: Deadlock to receive cylinder, operable from both sides of door. See Section 087100 "Door Hardware" for lock cylinder and keying requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with ASTM E 557 except as otherwise required by operable panel partition manufacturer's written installation instructions.
- B. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.
- C. Install panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
- E. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

3.3 ADJUSTING

- A. Adjust operable panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust pass doors to operate smoothly and easily, without binding or warping. Pass doors must meet the noise reduction requirements of the operable wall.
- C. Verify that safety devices are properly functioning.

3.4 MAINTENANCE SERVICE

- A. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by manufacturer's authorized service representative. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operable-partition operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION 102239

SECTION 102600 - WALL AND DOOR PROTECTION

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. This Section includes the following:
 - 1. Corner guards.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, impact strength, fire-test-response characteristics, dimensions of individual components and profiles, and finishes for each impact-resistant wall-protection unit.
- B. Shop Drawings: For each impact-resistant wall-protection unit showing locations and extent. Include sections, details, and attachments to other work.
- C. Qualification Data: For Installer.
- D. Maintenance Data: For each impact-resistant wall-protection unit to include in maintenance manuals.
 - 1. Include recommended methods and frequency of maintenance for maintaining optimum condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.
- E. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain impact-resistant wall-protection units through one source from a single manufacturer.

- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of impact-resistant wall-protection units and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- D. Fire-Test-Response Characteristics: Provide impact-resistant, plastic wall-protection units with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store impact-resistant wall-protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 70 deg F (21 deg C) during the period plastic materials are stored.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install impact-resistant wall-protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F (21 deg C) for not less than 72 hours before beginning installation and for the remainder of the construction period.
- B. Field Measurements: Verify actual locations of walls, columns, and other construction contiguous with impact-resistant wall-protection units by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall-protection units that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of materials beyond normal use.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 MATERIALS

- A. Stainless-Steel Sheet: ASTM A 240/A 240M.
- B. Adhesive: Type recommended by manufacturer for use with material being adhered to substrate indicated.
1. Use adhesives and sealants that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Gypsum Board and Panel Adhesives: 50 g/L.
 - b. Multipurpose Construction Adhesives: 70 g/L.
 - c. Contact Adhesive: 250 g/L.

2.3 CORNER GUARDS

- A. Surface-Mounted, Metal Corner Guards (CG): Fabricated from one-piece, formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Floor Products Co., Inc.
 - b. Arden Architectural Specialties, Inc.
 - c. Balco, Inc.
 - d. Construction Specialties, Inc.
 - e. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 - f. Korogard Wall Protection Systems; a division of RJF International Corporation.
 - g. Pawling Corporation.
 2. Material: Stainless steel, Type 304.
 - a. Thickness: Minimum 0.0625 inch (1.6 mm).
 - b. Finish: Directional satin, No. 4.
 3. Wing Size: Nominal 2-1/2 by 2-1/2 inches (65 by 65 mm).

4. Corner Radius: 1/8 inch (3 mm).
5. Height: 48 inches. Install above 4" rubber base.
6. Mounting: Adhesive.

2.4 FABRICATION

- A. Fabricate impact-resistant wall-protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- B. Preform curved semirigid, impact-resistant sheet wall covering in factory for radius and sheet thickness as follows:
 1. Sheet Thickness of 0.040 Inch (1.0 mm): 24-inch (610-mm) radius.
 2. Sheet Thickness of 0.060 Inch (1.5 mm): 36-inch (914-mm) radius.
- C. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- D. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.5 METAL FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 1. Remove tool and die marks and stretch lines, or blend into finish.
 2. Grind and polish surfaces to produce uniform finish, free of cross scratches.
 3. Run grain of directional finishes with long dimension of each piece.
 4. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- B. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of work.

1. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
2. For impact-resistant wall-protection units attached with adhesive or foam tape, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing impact-resistant wall-protection system components.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. General: Install impact-resistant wall-protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

3.4 CLEANING

- A. Immediately after completion of installation, clean covers and accessories using a standard, ammonia-based, household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600

SECTION 102800 - TOILET, BATH, AND LAUNDRY 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. This Section includes the following:
 - 1. Public-use washroom accessories.
 - 2. Public-use shower room accessories.
 - 3. Childcare accessories.
 - 4. Custodial accessories.
- B. Owner-Furnished Material but Contractor-Installed:
 - 1. Towel dispensers.
 - 2. Toilet paper dispensers.
 - 3. Soap dispensers.
- C. Owner-Furnished Material and Owner-Installed:
 - 1. Waste receptacles.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.
- B. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.4 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.
- C. Reference drawings for mounting heights.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.
- B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359-inch (0.9-mm) minimum nominal thickness.
- C. 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.
- D. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Bobrick Washroom Equipment, Inc.
 - 2. Bradley Corporation.
- B. Basis-of-Design: Products listed are as manufactured by Bobrick or Bradley, unless noted otherwise. Equivalent product must meet function, quality and appearance of Bobrick/Bradley product, as judged solely by Architect.
- C. Grab Bar (GB-1, GB-2):
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - a. Bobrick; B-6806.
 - 2. Mounting: Flanges with concealed fasteners.
 - 3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.

- a. Finish: Smooth, No. 4, satin finish on ends and slip-resistant texture in grip area.
 4. Outside Diameter: 1-1/2 inches (38 mm).
 5. GB1 Lengths: Provide 36-inches on back wall.
 6. GB2 Lengths: Provide 42-inches on side wall.
- D. Sanitary-Napkin and Tampon Vendor (SNV):
1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - a. Bradley; 4017-10.
 2. Mounting: Semirecessed.
 3. Capacity: 30 napkins and 28 tampons.
 4. Operation: Single coin (25 cents).
 5. Exposed Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
 6. Lockset: Tumbler type with separate lock and key for coin box.
- E. Sanitary-Napkin Disposal Unit (SND):
1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - a. Bradley; 4781-11
 2. Mounting: Surface mounted
 3. Door or Cover: Self-closing disposal-opening cover.
 4. Receptacle: Removable.
 5. Material and Finish: Stainless steel, No. 4 finish (satin).
- F. Mirror Unit (MR):
1. Basis-of-Design Product: Subject to compliance with requirements, provide the following:
 - a. Bradley; 780
 2. Frame: Stainless-steel angle, 0.05 inch (1.3 mm) thick.
 - a. Corners: Welded and ground smooth.
 3. Mirror: Tempered glass.
 4. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
 - a. One-piece, galvanized steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.

5. Size: 18 inches wide by 36 inches high, unless otherwise indicated.

2.3 PUBLIC-USE SHOWER ROOM ACCESSORIES

- A. Basis-of-Design Product: The design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
1. Bobrick Washroom Equipment, Inc.
 2. Bradley Corporation.
- B. Shower Curtain Rod (SCR):
1. Basis-of-Design Product: Bobrick B-6047.
 2. Description: 1-1/4-inch (32-mm) OD; fabricated from nominal 0.05-inch- (1.3-mm-) thick stainless steel.
 3. Mounting Flanges: Stainless-steel flanges designed for exposed fasteners.
 4. Finish: No. 4 (satin).
- C. Shower Curtain (SC):
1. Basis-of-Design Product: Bobrick B-204
 2. Size: Minimum 6 inches (152 mm) wider than opening by 72 inches (1828 mm) high.
 3. Material: Vinyl, minimum 0.006-inch- (0.15-mm-) thick, opaque, matte.
 4. Color: As selected from manufacturer's full range.
 5. Grommets: Corrosion resistant at minimum 6 inches (152 mm) o.c. through top hem.
 6. Shower Curtain Hooks: Chrome-plated or stainless-steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one hook per curtain grommet.
- D. Folding Shower Seat (FSS):
1. Basis-of-Design Product: Bobrick B-5181
 2. Configuration: L-shaped seat, designed for wheelchair access.
 3. Seat: Phenolic or polymeric composite of slat-type or one-piece construction in color as selected by Architect.
 4. Mounting Mechanism: Stainless steel, No. 4 finish (satin).
- E. Grab Bar (GB-3 and GB-4):
1. Basis-of-Design Product: Bobrick B-6861 – modified.
 2. Mounting: Flanges with concealed fasteners.
 3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
 - a. Finish: Smooth, No. 4, satin finish on ends and slip-resistant texture in grip area.
 4. Outside Diameter: 1-1/2 inches (38 mm).
 5. Configuration and Length:

- a. GB-3: 33 inches from rear wall, 18 inches from control wall.
- b. GB-4: 33 inches from rear wall, 42 inches from control wall.

F. Robe Hook (RH):

1. Basis-of-Design Product: Bobrick B-6717
2. Material and Finish: Stainless steel, No. 4 finish (satin).
3. Projection: 2 inches.

2.4 CHILDCARE ACCESSORIES

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:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. American Specialties, Inc.
2. Brocar Products, Inc.
3. Diaper Deck & Company, Inc.
4. GAMCO Specialty Accessories; a division of Bobrick.
5. Koala Kare Products.
6. SafeStrap Company, Inc. (SSC, Inc.).
7. Tubular Specialties Manufacturing, Inc.

C. Diaper-Changing Station (BCS):

1. Basis-of-Design Product: American Specialties

- a. 9013

2. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.

- a. Engineered to support a minimum of 250-lb (113-kg) static load when opened.

3. Mounting: Semirecessed, with unit projecting not more than 1 inch (25 mm) from wall when closed.

4. Operation: By pneumatic shock-absorbing mechanism.

5. Material and Finish: Stainless steel, No. 4 finish (satin), exterior shell with rounded plastic corners; HDPE interior in manufacturer's standard color.

6. Liner Dispenser: Built in.

2.5 CUSTODIAL ACCESSORIES

A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.

B. Mop and Broom Holder (MBH):

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bobrick Washroom Equipment, Inc.
 - b. Bradley Corporation.
2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 36 inches (914 mm).
4. Hooks: Four.
5. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, No. 4 finish (satin).
 - a. Shelf: Not less than nominal 0.05-inch- (1.3-mm-) thick stainless steel.
 - b. Rod: Approximately 1/4-inch- (6-mm-) diameter stainless steel.
7. Location: All custodial closets and anywhere else as indicated on drawings.

2.6 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. 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 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 (1112 N), when tested according to method in ASTM F 446.

3.2 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 recommendations.

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END OF SECTION 102800

TOILET, BATH, AND LAUNDRY ACCESSORIES

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SECTION 104413 - FIRE PROTECTION CABINETS

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. Fire-protection cabinets for the following:
 - a. Portable fire extinguishers.
- B. Related Requirements:
 - 1. Section 104416 "Fire Extinguishers."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semi-recessed-, or surface-mounting method and relationships of box and trim to surrounding construction.
 - 1. Show location of knockouts for hose valves.
- B. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semi-recessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.4 CLOSEOUT SUBMITTALS

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

1.5 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.

1.6 SEQUENCING

- A. Apply decals vinyl lettering on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 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.

2.2 FIRE-PROTECTION CABINET (FEC)

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Fire-End & Croker Corporation.
 - b. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - c. Larsens Manufacturing Company.
 - d. Modern Metal Products, Division of Technico Inc.
 - e. Nystrom, Inc.
 - f. Potter Roemer LLC.
 - g. Strike First Corporation of America.
- B. Cabinet Construction: Nonrated.
- C. Cabinet Material: Cold-rolled steel sheet.
 - 1. Shelf: Same metal and finish as cabinet.
- D. Semi-recessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: 2-1/2-inch (64-mm) backbend depth.
- E. Cabinet Trim Material: Steel sheet.

- F. Door Material: Steel sheet.
- G. Door Style: Vertical duo panel with frame.
- H. Door Glazing: Acrylic or polycarbonate sheet.
- 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. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - 2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - a. Location: Applied to cabinet door.
 - b. Application Process: Silk-screened.
 - c. Lettering Color: Red.
 - d. Orientation: Vertical.
 - 3. Alarm: Manufacturer's standard alarm that actuates when fire-protection cabinet door is opened and that is powered by batteries.
- K. Materials:
 - 1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
 - a. Finish: Baked enamel or powder coat.
 - b. Color: As selected by Architect from full range of industry colors and color densities.
 - 2. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

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.

3. Prepare doors and frames to receive locks.
 4. Install door locks at factory.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
 2. Fabricate door frames of one-piece construction with edges flanged.
 3. 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 AMP 500, "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. 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 roughing-in for hose racks and cabinets to verify actual locations of piping connections before cabinet installation.
- B. Examine walls and partitions for suitable framing depth and blocking where semi-recessed cabinets will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

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.
 - 1. Fire-Protection Cabinets: 54 inches (1372 mm) above finished floor to top of cabinet.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Identification: Apply decals at locations indicated.

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. Verify that integral locking devices operate properly.
- 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 and mounting bracket manufacturers.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

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 portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.
- B. Related Requirements:
 - 1. Section 104413 "Fire Protection Cabinets."

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
- B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

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

1.7 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. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10.
 - b. Faulty operation of valves or release levers.
 - 2. 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.
 - 1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Amerex Corporation.
 - b. Ansul Incorporated.
 - c. Badger Fire Protection.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. Guardian Fire Equipment, Inc.
 - g. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - h. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
 - i. Larsens Manufacturing Company.
 - j. Moon American.
 - k. Nystrom Building Products.
 - l. Pem All Fire Extinguisher Corp.
 - m. Potter Roemer LLC.

- n. Pyro-Chem; Tyco Safety Products.
 - o. Strike First Corporation of America.
- 2. Valves: Manufacturer's standard.
 - 3. Handles and Levers: Manufacturer's standard.
 - 4. 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: UL-rated 4-A:60-B:C, 10-lb (4.5-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.
- C. Purple-K wet chemical type in aluminum container: Class K, 1.8 Gal (6 liter) nominal capacity, with potassium acetate solution in enameled steel container, with wall bracket for exposed installation.

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.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Amerex Corporation.
 - b. Ansul Incorporated.
 - c. Badger Fire Protection.
 - d. Buckeye Fire Equipment Company.
 - e. Fire End & Croker Corporation.
 - f. Guardian Fire Equipment, Inc.
 - g. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - h. Larsens Manufacturing Company.
 - i. Nystrom Building Products.
 - j. Potter Roemer LLC.
 - k. Strike First Corporation of America.
- 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.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
 - 1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416

SECTION 105113 - METAL LOCKERS

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. This Section includes the following:
 - 1. Athletic lockers.
 - 2. Student corridor wardrobe lockers.
- B. Related Sections include the following:
 - 1. Section 033000 "Cast-in-Place Concrete" for concrete bases and concrete locker room benches.
 - 2. Section 061053 "Miscellaneous Rough Carpentry" for wood furring and grounds.
 - 3. Section 096513 "Resilient Base and Accessories" for resilient base where indicated.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
 - 1. Show locker fillers, trim, base, sloping tops, and accessories. Include locker-numbering sequence.
- C. Samples for Verification: For the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used for the Work.
 - 1. Lockers.
- D. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain locker units and accessories through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for locker installation.
- B. Protect lockers from damage during delivery, handling, storage, and installation.
- C. Deliver master keys, control keys, and combination control charts to Owner.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
 - 1. DeBourgh Manufacturing Co.
 - 2. Hadrian Manufacturing, Inc.
 - 3. Lyon Metal Products, Inc.
 - 4. Republic Storage Systems Co., Inc.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 366/A 366M, matte finish, suitable for exposed applications, and stretcher leveled or roller leveled to stretcher-leveled flatness.
- B. Galvanized Steel Sheet: ASTM C 653/A 653M, commercial quality, G60 (Z180) coating designation; mill phosphatized; suitable for exposed applications, and stretcher leveled or roller leveled to stretcher leveled flatness.
- C. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

2.3 WARDROBE LOCKERS (KNOCK-DOWN CONSTRUCTION)

- A. Body: Form backs, tops, bottoms, sides, and intermediate partitions from steel sheet; flanged for double thickness at back vertical corners. Comply with the following:
1. Back-Material Sheet Thickness: 24 gage 0.0239 inch (0.60 mm).
 2. Side-Material Sheet Thickness: 24 gage 0.0239 inch (0.60 mm).
 3. Exposed Ends: Form exposed ends of nonrecessed lockers from minimum 16 gage 0.0598 inch (1.50 mm) thick steel sheet.
- B. Frames: Form channel frames from minimum 16 gage 0.0598-inch-thick steel sheet; lapped and welded at corners. Form continuous integral door strike on vertical frame members. Provide resilient bumpers to cushion door closing.
1. Latch Hooks: Form from minimum 12 gage 0.1046-inch- thick steel; welded or riveted to door frames.
 2. Cross Frames: Form intermediate channel cross frames between tiers from minimum 16 gage 0.0598-inch-thick steel sheet. Weld to vertical frame members.
- C. Doors: One-piece steel sheet, formed into channel shape at vertical edges and flanged at right angles at top and bottom edges. Fabricate to prevent springing when opening or closing, and to swing 180 degrees. Comply with the following:
1. Sheet Thickness: 16 gage 0.0598 inch.
 2. Reinforcement: Brace or reinforce inner face of doors more than 15 inches wide.
 3. Acoustical Treatment: Fabricate lockers for quiet operation with manufacturer's standard rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact.
 4. Louvered Vents: Stamped, louvered vents in door face, as follows:
 - a. Double-Tier Lockers: No fewer than three louver openings at top and bottom.
- D. Shelves: Provide hat shelf in single-tier units; fabricated from minimum 24 gage 0.0239 inch (0.60 mm) thick, formed steel sheet; flanged on all edges.
- E. Hinges: Steel, full loop, five or seven knuckle; tight pin; minimum 2 inches high. Weld to inside of door frame and to door.
1. Provide at least three hinges for each door more than 42 inches high and at least two hinges for each door 42 inches high or less.
- F. Recessed Handle and Latch: Manufacturer's standard housing, formed from 20 gage, 0.0359-inch-thick nickel-plated steel or stainless steel, with integral door pull, recessed for latch lifter and locking devices; nonprotruding latch lifter; and automatic, prelocking, pry-resistant latch, as follows:
1. Provide minimum three-point latching for each door more than 42 inches high; minimum two-point latching for each door 42 inches high or less.

2.4 ATHLETIC LOCKERS (WELDED CONSTRUCTION)

- A. Body: Form tops and bottoms from minimum 16 gage, 0.0598-inch-thick steel sheet.
 - 1. Perforated-Metal Backs: Form backs from minimum 16 gage, 0.0598-inch-thick steel sheet, with manufacturer's standard perforations; rectangular, round, square, diamond.
 - 2. Perforated-Metal Sides and Intermediate Partitions: Form backs from minimum 16 gage, 0.0598-inch-thick steel sheet, with manufacturer's standard perforations; rectangular, round, square, diamond.
- B. Frames: Form welded frames from minimum 16 gage (0.0598 inch) thick, steel sheet channels or minimum 12 gage (0.1046-inch-) thick steel angles.
 - 1. Hooks: Form from minimum 12 gage, 0.1046-inch- thick steel; welded or riveted to door frames.
 - 2. Cross Frames: Form intermediate channel cross frames between tiers from minimum 16 gage, 0.0598-inch-thick steel sheet. Weld to vertical frame members.
- C. Perforated Steel Doors: Form doors from one-piece perforated steel sheet with flanged edges, complying with the following:
 - 1. Sheet Thickness: 16 gage, 0.0598 inch minimum.
 - 2. Reinforcement: Brace or reinforce inner face of doors more than wide.
 - 3. Perforations: Provide manufacturer's standard perforations; rectangular, round, square, or diamond.
- D. Continuous Hinges for Athletic Lockers: Manufacturer's standard, steel continuous hinge, side or top mounted to door and frame.
- E. Recessed Handle and Latch: Manufacturer's standard housing, formed from 20 gage thick nickel-plated steel or stainless steel, with integral door pull, recessed for latch lifter and locking devices; nonprotruding latch lifter; and automatic, prelocking, pry-resistant latch, as follows:
 - 1. Provide minimum three-point latching for each door more than 42 inches (1067 mm) high; minimum two-point latching for each door 42 inches (1067 mm) high or less.

2.5 OPEN-FRONT ATHLETIC METAL LOCKERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide DeBourgh Manufacturing Co.; APEX Sport Lockers or comparable product by one of the manufacturers listed.
- B. Locker Arrangement at Area S Baseball/Softball athletics building:
 - 1. Type E: 24 inches wide by 18 inches deep by 72 inches open front lockers, with seat/footlocker and upper shelf with security box.
 - 2. Type F: 18 inches wide by 18 inches deep by 72 inches open front lockers, with seat/footlocker and upper shelf with security box.

- C. Material: Cold-rolled, steel sheet.
- D. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
 - 1. Tops and Bottoms: 0.060-inch (1.52-mm) nominal thickness, with single bend at edges.
 - 2. Backs: 0.048-inch (1.21-mm) nominal thickness.
 - 3. Shelves: 0.060-inch (1.52-mm) nominal thickness, with double bend at front and single bend at sides and back.
- E. Perforated Sides: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.
- F. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet or 0.105-inch (2.66-mm) nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames.
- G. Reinforced Bottoms: Structural channels, formed from 0.075-inch (1.90-mm) nominal-thickness steel sheet; welded to front and rear of side-panel frames.
- H. Seats/Footlockers: Enclosure full width of bottom of metal locker; fabricated from cold-rolled steel sheet.
 - 1. Seat/Lid: 0.075-inch (1.90-mm) nominal-thickness steel sheet; channel formed and reinforced with stiffeners; with manufacturer's standard, steel continuous hinge that is completely concealed and tamper resistant when seat/lid is closed; with padlock hasp.
 - 2. Front Panel: 0.075-inch (1.90-mm) nominal-thickness steel sheet; channel formed at top edge; with mini-louvers for ventilation; recessed for padlock loop.
 - 3. Sides: Integral part of unperforated sides.
- I. Security Boxes: Consisting of partition extending from upper shelf to top of metal locker, fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; with channel-formed, 0.060-inch (1.52-mm) nominal-thickness, steel sheet door frame, and door fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet with right-angle single bend at edges; with manufacturer's standard, steel continuous hinge that is completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.
 - 1. Single-Point Latching: Stainless-steel strike plate with integral pull; with steel, nonmoving latch hook with steel padlock loop that projects through door and is finished to match metal locker body.
- J. Locks: Recessed combination padlocks by Owner
- K. Equipment: Equip each metal locker with identification plate and the following unless otherwise indicated:
 - 1. Two single-prong wall hooks bolted to locker back.
 - 2. Coat rod and two rod holders.
- L. Accessories:

1. Continuous Sloping Tops: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet, with a pitch of approximately 20 degrees.
 - a. Closures: Vertical and hipped-end type.
2. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
3. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.

M. Finish: Baked enamel or powder coat.

1. Color: As selected by Architect from manufacturer's full range.

2.6 LOCKS

- A. Fabricate lockers to receive the following locking devices, installed on lockers using security-type fasteners:
1. Built-in Combination Locks for Student Corridor Wardrobe Lockers: Key-controlled, three-number dialing combination locks; capable of at least five combination changes made automatically with a control key. Comply with the following:
 - a. Bolt Operation: Automatically locking bolt.
 2. Provide 5% of all student corridor wardrobe lockers with an ADA compliant locking device.
 3. Combination Padlocks for Athletic Lockers, Officials, Kitchen Staff and Coaches Locker Rooms: Padlocks provided by others.

2.7 LOCKER ACCESSORIES

- A. Interior Equipment: Furnish each locker with the following items, unless otherwise indicated:
1. Hooks: Manufacturer's standard zinc-plated, ball-pointed steel. Provide one double-prong ceiling hook, and not fewer than two single-prong wall hooks for single-, double-, and triple-tier units. Attach hooks with at least two fasteners.
- B. Number Plates: Manufacturer's standard etched, embossed, or stamped, aluminum number plates with numerals at least 3/8 inch high. Number lockers in sequence indicated. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
- C. Concrete Base at Lockers: Refer to drawing detail.
- D. Continuously Sloping Tops: Manufacturer's standard, fabricated from minimum 16 gage steel sheet, for installation over lockers with separate flat tops. Fabricate tops in lengths as long as practicable, without visible fasteners at splice locations, finished to match lockers. Provide fasteners, filler plates, supports, and closures, as follows:

1. Closures: Vertical-end type.
2. Sloped top corner fillers, mitered.
3. Slope tops at 25-degree pitch.

E. Filler Panels: Fabricated from minimum 14 gage steel sheet in an unequal leg angle shape, and finished to match lockers.

2.8 LOCKER BENCHES

A. ADA(TAS)-Compliant Benches shall comply with TAS 903., and “PolyLife” HDPE as manufactured by PSISC/Columbia Lockers, or equal.

B. Provide bench units with overall assembly height of 17-1/2 inches.

C. Bench Tops: Manufacturer’s standard one-piece units with rounded corners and edges.

1. Size: Minimum 9-1/2 inches wide by 1-1/2 inches thick except provide minimum 20-inch-wide tops where accessible benches are indicated.
2. Materials: HDPE plastic, 30 percent recycled material with matte texture finish top.

D. Back support. ADA-compliant benches shall have back supports complying with TAS 903.4.

E. Fixed Pedestals: Manufacturer’s standard supports with pre-drilled fastener holes for attaching bench top and anchoring to floor complete with fasteners and anchors, and as follows:

1. Tubular Steel: 1-1/2-inch-diameter steel tubing threaded on both ends, with standard pipe flange at top and bell-shaped cast-iron base; with anodized finish; anchored with exposed fasteners.
 - a. Color: Black anodized.

F. Strength: Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds is applied at any point on the seat, fastener, mounting device, or supporting structure.

2.9 FABRICATION

A. Knocked-Down Construction (Student Corridor and Kitchen Staff Wardrobe): Fabricate lockers for nominal assembly at Project site.

B. All-Welded Construction (PE, Athletic Lockers, Officials and Coaches Locker Rooms): Preassemble lockers by welding all joints, seams, and connections, with no bolts, screws, or rivets used in assembly. Grind exposed welds flush.

C. Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch. Weld frame members together to form a rigid, one-piece assembly.

METAL LOCKERS

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1. Form locker-body panels, doors, shelves and accessories from one-piece steel sheet.

2.10 FINISHES, GENERAL

- A. Finish all steel surfaces and accessories, except prefinished stainless-steel and chrome-plated surfaces.
- B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.11 STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond. Use manufacturer's standard methods.
- B. Powder-Coated Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard baked-polymer finish consisting of a thermosetting powder topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.
 1. Color and Gloss: Custom colors for each Area A, B and C student lockers and Athletic lockers to match Architect's samples.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine concrete bases and concrete locker room benches for suitable conditions where metal lockers are to be installed.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install metal lockers and accessories level, plumb, rigid, and flush according to manufacturer's written instructions.
- B. Assemble knocked-down lockers with standard fasteners, with no exposed fasteners on door faces and face frames.
- C. Connect groups of all-welded lockers together with standard fasteners, with no exposed fasteners on face frames.
- D. Anchor lockers concrete bases, locker room benches or floors and walls at intervals recommended by manufacturer, but not more than 36 inches o.c. Install anchors through backup reinforcing plates where necessary to avoid metal distortion, using concealed fasteners.
- E. Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 - 1. Attach sloping top units to lockers, with closures at exposed ends.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.
- B. Clean interior and exposed exterior surfaces and polish stainless-steel and nonferrous-metal surfaces.
- C. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit locker use during construction.
- D. Touch up marred finishes, or replace locker units that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 107500 - FLAGPOLES

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 ground-mounted flagpoles made from aluminum.
- B. Owner-Furnished Material: Flags.
- C. Related Sections:
 - 1. Section 265600 "Exterior Lighting" for site lighting fixtures.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand the effects of gravity loads, and the following loads and stresses within limits and under conditions indicated according to the following design criteria:
 - 1. Seismic Loads: according to SEI/ASCE 7.
 - 2. Wind Loads: 90 mph according to NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles."
 - 3. Base flagpole design on two (2) polyester flags of maximum standard size (3-feet by 5-feet) suitable for use with each flagpole or flag size indicated, whichever is more stringent.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.
- B. Shop Drawings: For flagpoles. Include plans, elevations, details, and attachments to other work. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
 - 1. Include section, and details of foundation system for ground-mounted flagpoles.

- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Delegated-Design Submittal: For flagpole assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer in state of Kansas responsible for their preparation.
 - 1. Include loads and point reactions and design of concrete footings.
- E. Qualification Data: For qualified professional engineer.
- F. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain flagpole as complete unit, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. General: Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Flagpole; a Kearney-National Inc. company.
 - 2. Atlantic Fiberglass Products, Inc.
 - 3. Baartol Company.
 - 4. Concord Industries, Inc.
 - 5. Eder Flag Manufacturing Company, Inc.
 - 6. Ewing Flagpoles.
 - 7. Interstate Pole, Inc.
 - 8. Lingo Inc.; Acme Flagpole Company Division.
 - 9. Millerbernd Manufacturing Company.
 - 10. Morgan-Francis; Division of Original Tractor Cab Co., Inc.
 - 11. PLP Composite Technologies, Inc.
 - 12. Pole-Tech Company Inc.
 - 13. U.S. Flag & Flagpole Supply, LP.
 - 14. USS Manufacturing Inc.

FLAGPOLES

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2.2 FLAGPOLES

- A. Flagpole Construction, General: Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:
1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
 2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.
 3. Provide self-aligning, snug-fitting joints.
- B. Exposed Heights: 30-feet (9 m) and 25-feet (7.5 m).
- C. Aluminum Flagpoles: Provide cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch (4.8 mm).
- D. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, not less than 0.064-inch- (1.6-mm-) nominal wall thickness. Provide with 3/16-inch (4.8-mm) steel bottom plate and support plate; 3/4-inch- (19-mm-) diameter, steel ground spike; and steel centering wedges welded together. Galvanize steel after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole.
1. Provide flashing collar of same material and finish as flagpole.
 2. Provide steel ground protectors extending 12 inches (300 mm) aboveground and 6 inches (150 mm) belowground for steel flagpoles where flashing collars are not provided.
- E. Cast-Metal Shoe Base: For anchor-bolt mounting; provide with anchor bolts.
1. Provide units made from aluminum with same finish and color as flagpoles.
 2. Provide ground spike at grade-mounted flagpoles.
 3. Provide connector to building's lightning protection system conductor at roof-mounted flagpoles.

2.3 FITTINGS

- A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.
1. 0.063-inch (1.6-mm) spun aluminum, finished to match flagpole.
- B. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.
1. Halyard Flag Snaps: Provide two chromium-plated bronze swivel snap hooks per halyard.

2.4 MISCELLANEOUS MATERIALS

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- B. Sand: ASTM C 33, fine aggregate.
- C. Elastomeric Joint Sealant: Comply with requirements in Section 079200 "Joint Sealants" for Use NT (nontraffic) and for Use M, G, A, and, as applicable to joint substrates indicated, for Use O.

2.5 GENERAL FINISH REQUIREMENTS

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

2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, including foundation; accurate placement, pattern, orientation of anchor bolts, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.
- B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.
- C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

FLAGPOLES

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- D. Place concrete, as specified in Section 033000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use non-staining curing compound.
- E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.3 FLAGPOLE INSTALLATION

- A. General: Install flagpoles where shown and according to Shop Drawings and manufacturer's written instructions.
- B. Ground Set: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure. Install flagpole, plumb, in foundation tube.
 - 1. Foundation Tube: Place tube seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION 107500

SECTION 111300 - LOADING DOCK EQUIPMENT

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. Dock bumpers.

- B. Related Sections:

- 1. Section 055000 "Metal Fabrications" for curb angles at edges of loading dock.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for loading dock equipment. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

- B. Shop Drawings: For loading dock equipment. Include plans, elevations, sections, details, and attachments to other work.

- 1. Provide templates for anchors and bolts anchored to permanent construction.

- C. Qualification Data: For qualified Installer.

- D. Operation and Maintenance Data: For loading dock equipment to include in operation and maintenance manuals.

- E. Warranty: Sample of special warranty.

1.4 WARRANTY

- A. Warranty Period for Structural Assembly: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DOCK BUMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. American Floor Products Company, Inc.
 2. Beacon Industries, Inc.
 3. Chalfant Dock Equipment.
 4. Durable Corporation.
 5. Ellis Industries, Inc.
 6. Flexon, Inc.
 7. Hugger Dock Equipment Company; Division of Columbus Foam Products, Inc.
 8. Pawling Corporation; Architectural Products Division.
 9. Pentalift Equipment Corporation.
 10. Pioneer Loading Dock Equipment.
 11. Rite-Hite Corporation.
 12. Rol-Lift Corporation.
 13. SPX Dock Products - Kelley.
 14. SPX Dock Products - Serco.
 15. Super Seal Mfg. Ltd.
 16. Tennessee Mat Company, Inc.
 17. Vestil Manufacturing Company.
- B. Laminated-Tread Dock Bumper: Fabricated from multiple, uniformly thick plies cut from fabric-reinforced rubber tires. Laminate plies under pressure on not less than two 3/4-inch- (19-mm-) diameter, steel supporting rods that are welded at one end to 1/4-inch- (6-mm-) thick, structural-steel end angle and secured with a nut and angle at the other end. Fabricate angles with predrilled anchor holes and sized to provide not less than 1 inch (25 mm) of tread plies extending beyond the face of closure angles.
1. Thickness: 4-1/2 inches (114 mm).
 2. Horizontal Style: 10 inches (250 mm) high by 24 inches wide.
- C. Anchorage Devices: Hot-dip galvanized-steel anchor bolts, nuts, washers, bolts, sleeves, cast-in-place plates, and other anchorage devices as required to fasten bumpers securely in place and to suit installation type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of loading dock equipment.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate size and location of loading dock equipment indicated to be attached to or recessed into concrete or masonry, and furnish anchoring devices with templates, diagrams, and instructions for their installation.

3.3 INSTALLATION

- A. General: Install loading dock equipment as required for a complete installation.
- B. Dock Bumpers: Attach dock bumpers to face of loading dock in a manner that complies with requirements indicated for spacing, arrangement, and position relative to top of platform and anchorage.
 - 1. Bolted Attachment: Attach dock bumpers to preset anchor bolts embedded in concrete or to cast-in-place inserts or threaded studs welded to embedded-steel plates or angles. If preset anchor bolts, cast-in-place inserts, or threaded studs welded to embedded-steel plates or angles are not provided, attach dock bumpers by drilling and anchoring with expansion anchors and bolts.
 - 2. Screw Attachment: Attach dock bumpers to wood construction with lag bolts as indicated.

3.4 ADJUSTING

- A. After completing installation of exposed, factory-finished loading dock equipment, inspect exposed finishes and repair damaged finishes.

END OF SECTION 111300

SECTION 111900 – DETENTION SURFACE PADDING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specifications, apply to this Section.

1.2 SUMMARY

- A. Surface padding system for walls, doors and frames of sensory rooms.
- B. System shall consist of field-applied MF-SILTEC, covered with bullet resistant Kevlar by DuPont and a protective top coat of high-build liquid vinyl.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide detention surface padding system which isolates detainees from hard surfaces within the scheduled detention area.
 - 1. Padded surface system shall resist chipping and peeling.
 - 2. Padded surface system shall be easy to clean.
 - 3. Padded surface system shall be water-repellent, impervious to oil, urine and salt.

1.4 QUALITY ASSURANCE

- A. Comply with governing codes and regulations.
- B. Applicator Qualifications: Application shall be performed by an applicator with a minimum of 5 years experience in the successful fabrication and installation of detention surface padding system.
- C. Deliver, handle and store materials in accordance with manufacturer's instructions.
- D. Surface burning characteristics of detention surface system when tested in accordance with UL Standard 723 (ASTM E 84) must be equal to or less than:
 - 1. Flame Spread Index: 10.
 - 2. Fuel Contributed: 10.
 - 3. Smoke Developed: 160.
- E. Compression Deflection (ASTM D 1056): 4 psi at 25% deflection.

- F. Acute Oral Toxicity Test: Nontoxic.
- G. Fungus Resistance (ASTM G-21-90): 0 (Completely resistant).
- H. CSS 12-100-1: Corner Test – Pass.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions. Include methods of installation of surface padding system for each type of substrate to receive padding.
- B. Shop Drawings: Submit shop drawings showing typical method of padding application.
- C. Maintenance Information: Submit, for Owner's use, information regarding the proper care and maintenance of detention surface padding system.

1.6 WARRANTY

- A. Padded surface to be guaranteed impenetrable by organic human body parts for a period of three years from date of manufacturer's installation approval for use. Should penetration occur, the damage will be repaired or the surface replaced at the manufacturer's option.
- B. Conditions: This guarantee does not apply to damage caused by non-organic human body parts, nor damage resulting from use prior to completion of final curing. This product is not intended to replace established management practices, but to supplement those practices, while allowing for a greater degree of protection against client self-injury.

PART 2 - PRODUCTS

2.1 DETENTION SURFACE PADDING SYSTEM

- A. Manufacturer: Subject to compliance with requirements, provide system fabricated by the following; no substitutions.
 - 1. B & E; Padded Surfaces.

2.2 MATERIALS

- A. Foam Sheets: MFSiltec-500.
 - 1. Features:
 - a. Nonflammable, nontoxic, and inherently durable.
 - b. A nonconductive foam polymer with excellent cushioning, fire blocking, thermal insulating and acoustic/vibration dampening properties.

DETENTION SURFACE PADDING SYSTEM

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- c. Structurally resilient with low compression set and 100% memory.
 - d. Continuous Operating Temperature Range: -70 deg F to +500 degrees F.
 - e. Odorless, tasteless and non-corrosive.
2. Specifications:
- a. ASTM D 3674 and E 162: Pass.
 - b. UL-94: V-O.
 - c. California Technical Bulletin 117: Pass.
 - d. FMVSS 302: Pass.
 - e. ASTM E662 (Flaming Mode): Ds at 1.5 min. < 50.
 - f. ASTM E662 (Non Flaming Mode): Ds at 4 min. < 100.
 - g. Bombardier SMP 800-C: Pass.
 - h. ASTM D573: Pass.
3. Compression Set, % ASTM D-1056 22 hours at 100 C: 5%.
4. Compression Deflection, PSI at 25%: 4 psi.
5. Tensile Strength, PSI: 25 psi minimum.
6. Elongation, %: 60% minimum.
7. Water Absorption, %: 10% maximum.
8. Thermal Conductivity k Factor: 0.30 (BTU in/hr/ft./F).
- B. Reinforcing Mesh: Kevlar bullet resistant material.
1. Tensile Strength (Average): 25,000 psi.
 2. Elongation at break: 10%.
- C. Encapsulate: High-build liquid vinyl of consistency to permit spray or field application.
- D. Color: As selected by Architect from manufacturer's full range of standard colors.
- E. Adhesive: Type compatible with the materials to be adhered.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which detention surface padding system is to be applied. Verify that substrate is in proper condition for installation of system. Do not proceed with installation until satisfactory conditions have been corrected.

3.2 PREPARATION

- A. Verify that ambient temperatures will be within range required by manufacturer for successful installation and curing of system.

- B. Verify that work of other trades are complete and will not adversely affect curing and protection of detention surface padding system.

3.3 INSTALLATION ON WALLS

- A. Cover specified areas with Kev-Koat padded material system.
- B. Apply protective topcoat to encapsulate entire padded surface.
 - 1. Color: As selected by Architect from manufacturer's full range of standard colors.
- C. Temperature must be 60 deg F at time of installation and maintained for the duration of the construction period and 30-day cure time.
- D. At penetrations of padding system for plumbing fixtures, air diffusers, lighting fixtures and security devises, coordinate with requirements of the respective trades for correct mounting.
- E. A 30-day cure time is required before rooms with detention surface padding can be utilized. Use prior to the 30-day cure time will void the three-year warranty.

3.4 DOOR PADDING PANEL FABRICATION

- A. Fabricate components to comply with performance and design requirements specified and in accordance with approved shop drawings.
- B. Door padding panels shall be composed of Kev-Koat padded material system adhered to a 3/4-inch thick fire-resistant plywood backing board.

3.5 CLEANING AND PROTECTION

- A. Touch up damage.
- B. Clean work area of debris associated with installation.
- C. Surface can be cleaned with a mild, non-abrasive liquid detergent.

END OF SECTION 111900

SECTION 114000 - FOOD SERVICE EQUIPMENT

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 Foodservice Equipment as scheduled on the drawings
- B. Whenever the term "KEC" or "Kitchen Equipment Contractor" is used, it shall be the company that is the successful bidder and is awarded the contract for the erection and completion of the work that is outlined herein to the complete satisfaction of the Owner's Representative.
- C. Whenever the term "FSEC" is used, it shall refer to the Food Service Equipment Consultant.
- D. KEC must perform all work in a timely fashion which is aligned with the overall construction schedule for the project. KEC must communicate any delays or schedule conflicts that they foresee to architect and general contractor in a timely fashion. Failure to communicate delays will not be acceptable.

1.3 RELATED WORK

- A. Division 01 for General Requirements.
- B. Divisions 22 and 23 for plumbing and mechanical.
- C. Division 26 for electrical.

1.4 SUBMITTALS

- A. Within (5) calendar days after award of contract, the KEC must provide an itemized list of equipment included in bid to the Owner, Architect, & FSEC for review to confirm conformity to written specifications. Failure to follow specifications as detailed in this Division 11 4000 may result in disqualification.
- B. Within thirty (30)calendar days after award of contract, the KEC is to supply (1) electronic copy and (4) printed, ¼" equals 1'-0" scale dimensioned plan drawings indicating location of all food service equipment along with its associated mechanical, electrical, plumbing, special conditions requirements and shop drawings for any and all custom fabricated equipment requiring approval prior to production.

- C. Within thirty (30) calendar days after award of contract, the KEC shall submit in quadruplicate, specification sheets with full data on all items of brand name manufacturer, catalog cuts to be organized in a single electronic document and clearly identified with item number to correspond with itemized specifications, hereinafter indicated.
- D. Approval of detailed shop drawings and specification sheets shall not waive obligation of KEC to furnish materials and methods of construction called for in specifications, even though they may be shown incorrectly, or, not at all, in the drawings.
- E. KEC must provide in duplicate paper copy and electronic copy a complete Operation and Maintenance Manual document for the project. KEC is responsible for confirming that these requirements meet needs as called for in General Requirements section of this bid specification.
- F. KEC must furnish all registered warranty information as of date of substantial completion to GC and Owner's Representative as it pertains to the equipment and services called for in this section 11 4000 specification.
- G. All equipment of brand name manufacturer shall be of the latest model or succeeding model at the time of the delivery. Any price adjustment in connection with this shall be requested of the Owner's Representative in writing.

1.5 WARRANTY

- A. Submit KEC's guarantee for all workmanship, material and equipment, for a period of one (1) year from the time the equipment is put into operation and accepted by the Owner's Representative. This warranty period shall not supersede any requirements made in the architectural specifications and it will be the responsibility of the KEC to confirm warranty coverage.
- B. Guarantee and conditions of service on items of brand name manufacturer, as established by the manufacturers, shall apply where extending beyond the guarantee and service set forth in these specifications.
- C. Reach-In Refrigeration Systems: For any reach in refrigeration units there shall be provided a full three year system parts and labor warranty to cover installation and parts associated with the reach-in refrigeration units; five year warranty on compressor/condensing unit and coil to cover parts and materials.
- D. Remote-Refrigeration Systems: For any remote refrigeration systems there shall be provided a full one year parts and labor warranty for any labor performed to install said remote refrigeration system. Additionally, a 5 year parts warranty should be provided on all compressors on remote refrigeration systems.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to perform work of this Section, who has specialized in installation of Food Service Equipment for a minimum of (5) years. Installer must have a successful performance record.

- B. The following are basic specifications of items of custom fabricated equipment covering the type and quality of materials, the method of fabrication, assembly and design and will be referred to in the itemized specifications by the term "as specified".
- C. All items of custom fabrication shall be the product of the single manufacturer of such equipment so as to insure uniformity throughout.
- D. All metal gauges shall be United States Standard.
- E. All workmanship shall be of the finest and all materials shall be new, of best quality and without flaws.
- F. NSF Standards: Comply with Applicable NSF International standards and criteria. All equipment to have NSF mark on each equipment item, unless otherwise indicated.
- G. All equipment shall comply with National Sanitation Foundation standards and all Federal, State and Local Health Codes.
- H. All gas equipment to be U.L. and AGA approved.
- I. All electrical equipment shall wear Underwriter's seal of approval.
- J. KEC to take part in Pre-Installation Conference and prescribed construction meeting(s). Coordinate with all trades for access, connections, disconnects and code compliance.

1.7 SUBSTITUTIONS

- A. Submit a written request to the FSEC and Architect for approval not less than (10) ten business days prior to bid date. Include description, drawings, and equipment cut sheet, performance test data and any other pertinent information regarding the specified item. Approval is subject to FSEC and Owner review.
- B. Any substitute for materials specified, or changes in methods of construction from the way specified and shown on the approved detail drawings is to be requested, in writing, from the Owner's Representative and FSEC, before any such substitution is applicable.
- C. Should any substituted items necessitate changes in utility connections related to this item, it will be the obligation of the KEC to properly notify the GC, Owner's Representative, and FSEC of such impacts at time of submittal request to ensure complete budget for cost impact of substitution is captured. Failure to notify said parties of any changes to utility requirements which result in additional costs to the project will be covered at the expense of the KEC.

1.8 DELIVERY, STORAGE AND HANDLING

- A. KEC will be responsible for storing equipment in safe and secure location prior to delivery to final project location. All equipment stored by KEC shall be covered by adequate insurance in order to protect from damage and loss.

- B. Deliver food service equipment as complete units with protective covering and in original boxes or crating.
- C. Remove packaging into site construction dumpsters to be provided by others.
- D. KEC supplied equipment shall be uncrated, set in place, sealed to wall (where noted) and sealed with NSF Silver, Clear or White silicone to be reviewed with owner.
- E. KEC is responsible for ensuring equipment is level and made ready for final connections by necessary trades.

1.9 SITE CONDITIONS

- A. It is the responsibility of the KEC to verify dimensions of food service equipment installation areas by conducting field measurements before custom fabricated equipment is approved for production.
- B. Establish rough-ins for all electrical, plumbing and mechanical connections and verify placement by conducting field visits to the project site as necessary.
- C. Where field measurements cannot be made without delaying the work, KEC shall establish required dimensions with architect and GC and proceed with fabricating equipment upon written approval of requisite hold-to dimensions.
- D. Coordinate construction dimensions and installation with other work as indicated in section 1.2.
- E. Field verification and coordination with G.C. to ensure that units can be delivered to their final destination through existing building openings. If KEC cannot build and install equipment in a fashion that utilizes existing building openings they must notify the architect and general contractor in writing to coordinate alternative delivery methods prior to bid. Failure to notify design team of delivery issues may result in additional costs that will be the responsibility of the KEC.

PART 2 - PRODUCTS

2.1 QUALIFIED FABRICATORS

- A. Qualifications: Minimum (5) years' experience constructing similar equipment for food service applications.
- B. Authorized Equipment Fabricators: The companies which have been listed below are approved for fabrication of stainless steel equipment detailed for this project. Substitutions are permitted per Section 1.6.
 - 1. Eagle Group
 - 2. Advance Tabco
 - 3. Elkay

2.2 GENERAL REQUIREMENTS

- A. All items of custom fabrication shall be the product of the single manufacturer of such equipment so as to insure uniformity throughout.
- B. All stainless steel to be fabricated per written specification for each item provided in section 3.5 PRODUCT SPECIFICATIONS below.
- C. All piecing of stainless steel, whether on cabinet surfaces or cabinet bases, shall be continuous welded joints. All welded joints shall be smooth and polished to original finish.
- D. Where galvanized iron is specified, it shall be copper bearing sheets, used in largest sizes with as few joints as possible. All welded joints shall be sandblasted and finished with rustproof galvanized zinc compound. All galvanized iron is to be finished with a prime coat and two (2) finish coats of hammerloid enamel.
- E. When plywood is used for backing, supports, construction of casework, it shall be no less than exterior grade plywood, manufactured per U.S. Product Standard PS-1-83, 5 or 7 ply, with waterproof glue.
- F. Where marine grade plywood is specified it will be manufactured per U.S. Product Standard PS-1-83, complete with Douglas Fir 1 and Western Larch. Plywood shall be 5 or 7 ply with waterproof glue.
- G. KEC is responsible for delivery assembly of all equipment in locations as they are reflected in the architectural and food service plans.
- H. KEC is responsible for caulking along seams for all equipment. Silicone shall be gray or silver to match finish of equipment. All sealing of equipment must be done in a neat and workmanlike manner.

2.3 FABRICATION REQUIREMENTS

- A. Base Cabinets
 - 1. To be constructed per shop drawings included in food service plans for this project. Cabinets must be constructed using methods specified in shop drawings.
- B. Pipe Stands and Open Base Tables
 - 1. All open base tables shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS.
- C. Field Joints
 - 1. IF NECESSARY, all field joints in both tops and cabinet bases shall be completely welded or seamed on the job and ground smooth and polished to match original finish by KEC. Tack welding or bolting in the field will not be accepted.

D. Drain Boards

1. All drain boards shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS.

E. Drawers

1. All drawers shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS and food service plans.

F. Doors

1. All doors shall be constructed per description provided for each item in written specification listed below in section 3.5 PRODUCT SPECIFICATIONS and food service plans.

G. Closure and Trim Panels

1. Where applicable above exhaust hoods and walk-in refrigeration the KEC will be responsible to provide closure and trim panels that match the finish of the equipment that they are incorporated into.

H. Elevated Shelving

1. Shelving to be mounted at a height of 54" AFF unless specified otherwise in an items particular written specification or food service plans.

I. Wall Flashing

1. KEC will be responsible for furnishing wall flashing underneath all Type I exhaust hoods. Metal used must be 22 gauge stainless and include trim at all breaks in the flashing panels. Flashing must be provided from top of finished floor to top side of hood and run complete length of hood unless local codes mandates to extend flashing 18" beyond exhaust hood. KEC to confirm with local Authority having jurisdiction before installation. It is the responsibility of the KEC to confirm that wall construction behind the hood is non-combustible. Should any materials be deemed to be limited combustible or combustible it will be responsibility of KEC to provide adequate clearance from materials. No Penetrations other than utilities to serve equipment allowed. Construction grade adhesive, or acceptable alternate, to secure flashing to wall; no mechanical fasteners to be used

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The KEC is to deliver set in place, and make ready for final connections all equipment which they provided per this section at locations where shown on plan. Applicable trades, unless otherwise noted, will be responsible for interconnecting serving counters and final utility connections.

- B. Install food service equipment level and plumb, according to manufacturer's written instructions, original design and referenced standards.
- C. Install equipment with access and maintenance clearances according to manufacturer's written instructions and requirements of authorities having jurisdiction.
- D. Provide cutouts in equipment, neatly formed where required in order to run service lines through equipment to make final connections.
- E. Provide final protection and maintain conditions, in a manner acceptable to manufacturers and installer that ensure food service equipment is without damage or deterioration at the time of substantial completion.
- F. KEC responsible for procurement of kitchen exhaust hoods, exhaust fans, make up air, and stainless wall flashing. Mechanical contractor responsible for installation of hoods, curbs, fans, MUA, ducting and pulling necessary permits. Mechanical contractor responsible for supplying and installation of Make Up Air ducting.
- G. KEC will be responsible for delivery of any walk-in refrigeration panels and systems to the project site unless otherwise specified. KEC is responsible for erecting all walk-in panels including necessary caulking as required by manufacturer to allow for proper performance. KEC is responsible for confirming that the pad on which any walk-in box will sit is transit level to ensure proper construction of the box by installer.
- H. KEC will be responsible for hanging evaporator coils per drawings. KEC to coordinate the location of condensing units with GC and MC. The installation of the remote condensing unit is the responsibility of the KEC but the installation of the curb on which the condensing unit should rest as well as any penetrations needed to run refrigeration lines through will performed by the GC. Refrigeration line sets to be provided and installed by KEC.
- I. Walk-in lights to be hung and wired by EC. Exposed conduit inside walk in complex not acceptable to wire components.
- J. Heat tape and NEMA rated outlet to which it connects inside walk-in unit is to be provided and installed by EC. Exposed conduit acceptable; penetrations must be sealed inside and out as to not create transfer of temperatures.
- K. Walk-in condensate piping to be provided and installed by PC. PC shall use copper plumbing. PVC will not be permitted. PC shall insulate all condensate drain lines in walk-in freezers and coolers using Armaflex.
- L. All hand sinks are to be provided by KEC and installed by PC.

3.2 CLEANING AND PROTECTION

- A. KEC shall remove all debris accumulated during the delivery and installation of his equipment daily and immediately upon completion of said installation.

- B. KEC will provide a representative, when necessary, to correlate final hook-up by related contractors, so as not to impede job progress.
- C. After final hook-up, they shall lubricate, start up and check out all equipment requiring this service, and shall clean equipment and turn over to the Owner's Representative, for their final acceptance, in first class condition, all items in their contract.

3.3 COMMISSIONING

- A. The KEC shall provide a capable representative or representatives, to demonstrate the proper use of the equipment, at the time selected by the Owner's Representative.
- B. It will be the responsibility of the KEC to verify with the Owner's Representative a complete list of equipment which the Owner and their staff will need training on. This list shall be compiled and then signed off on by the Owner's Representative and returned to Architect and FSEC.
- C. KEC shall provide a sign in sheet for all training sessions provided and return to Owner's Representative, Architect, and FSEC for records.
- D. The Owner's Representative is to give the KEC a minimum of seven (7) calendar days prior to this demonstration date.

3.4 PRODUCT SPECIFICATIONS

****NOTICE TO ALL BIDDERS****

- A. Items included in this Section 11 4000 specification provide for construction of equipment by several different fabricators who have been deemed to be of similar quality. It is the responsibility of the bidder to provide a bid for the equipment called for which matches all specifications laid out in the attached shop drawings. It will be the responsibility of the Kitchen Equipment Contractor to notify the FSEC and Architect of any inconsistencies that may result in decreased performance for the end user prior to bidding. Any deviations from what is called for without notification to the FSEC and Architect may result in corrective action having to be taken by KEC at their expense.

ITEM #1 WASHER/DRYER

- 1. By Others - NIKEC

ITEM #2 WIRE SHELVING

Quantity: One (1)
Prime Spec: Metro
Alternates: Eagle
Model: A2424NK3

1. Four (4) Model A2424NK3 Super Adjustable Super Erecta® Shelf, wire, 24"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
2. Four (4) Model 74PK3 Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

ITEM #3 WIRE SHELVING

Quantity: One (1)
Prime Spec: Metro
Alternates: Eagle
Model: A2424NC

1. Four (4) Model A2424NC Super Adjustable Super Erecta® Shelf, wire, 24"W x 24"D, chrome plated finish, corner release system, NSF
2. Four (4) Model 74P Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", chrome finish

ITEM #4 MOP SINK, MOP HANGER

1. By PC - NIKEC

ITEM #5 OFFICE FURNITURE

1. By Others - NIKEC

ITEM #6 LOCKER

Quantity: Six (6)
Prime Spec: SPG International
Alternates: None
Model: 4K0034

1. Model 4K0034 Kelmax Locker, two tier, single wide, (2) 12"W x 15"D x 36"H doors, beige powder coated paint finish, double latch, 6" legs

ITEM #7 TRACK SHELVING SYSTEM

Quantity: One (1)
Prime Spec: Metro
Alternates: Eagle
Model: BTEC

1. One (1) Model BTEC qwikTRAK™ High Density Storage System, stationary end unit kit, chrome-plated finish, includes: (8) 74"H posts & hardware to connect stationary end units to track & anchor track to floor, NSF (shelves sold separately)
2. One (1) Model BTS16NA HD qwikTRAK™ Track Set, 16 ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units)
3. Six (6) Model BTMC HD qwikTRAK™ High Density Storage System, mobile unit kit, includes: posts, casters, donut bumpers & hardware, chrome, NSF
4. Thirty Two (32) Model A2454NC Super Adjustable Super Erecta® Shelf, wire, 54"W x 24"D, chrome plated finish, corner release system, NSF

ITEM #8 WIRE SHELVING

Quantity: One (1)
Prime Spec: Metro
Alternates: Eagle
Model: A2460NC

1. Four (4) Model A2460NC Super Adjustable Super Erecta® Shelf, wire, 60"W x 24"D, chrome plated finish, corner release system, NSF
2. Four (4) Model 74P Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", chrome finish

ITEM #9 CAN RACK

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: OCR-10-9A

1. Model OCR-10-9A Panco® Can Rack, full size, mobile design, self feeding gravity fed shelves, designed for (162) #10 or (216) #5 cans, all welded extruded aluminum construction, 4" swivel plate casters, NSF

ITEM #10 SPARE NO.

ITEM #11 SPARE NO.

ITEM #12 SPARE NO.

ITEM #13 HAND SINK

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: HSA-10

1. Model HSA-10 Hand Sink, wall mount, 13-1/2" wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF
2. Model E44 Punching extra faucet holes or changing location of faucet holes from standard
3. T&S Brass Model EC-3105 ChekPoint™ Electronic Faucet, wall mount, 4" centers, rigid gooseneck spout, 2.2 GPM vandal resistant aerator, AC/DC control module with internal flow control, temperature control mixing valve with integral check valves, chrome-plated brass, flexible stainless steel supply hoses, ADA Compliant

ITEM #13A HAND SINK

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: HSA-10

1. Model HSA-10 Hand Sink, wall mount, 13-1/2" wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF
2. Model E44 Punching extra faucet holes or changing location of faucet holes from standard
3. Model -RS Right side splashes for handsink
4. T&S Brass Model EC-3105 ChekPoint™ Electronic Faucet, wall mount, 4" centers, rigid gooseneck spout, 2.2 GPM vandal resistant aerator, AC/DC control module with internal flow control, temperature control mixing valve with integral check valves, chrome-plated brass, flexible stainless steel supply hoses, ADA Compliant

ITEM #13B HAND SINK

Quantity: Two (2)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: HSA-10

1. Model HSA-10 Hand Sink, wall mount, 13-1/2" wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF
2. Model E44 Punching extra faucet holes or changing location of faucet holes from standard
3. Model -LS Left side splashes for handsink
4. T&S Brass Model EC-3105 ChekPoint™ Electronic Faucet, wall mount, 4" centers, rigid gooseneck spout, 2.2 GPM vandal resistant aerator, AC/DC control module with internal flow control, temperature control mixing valve with integral check valves, chrome-plated brass, flexible stainless steel supply hoses, ADA Compliant

ITEM #13C HAND SINK

Quantity: Two (2)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: HSA-10

1. Model HSA-10 Hand Sink, wall mount, 13-1/2" wide x 9-3/4" front-to-back x 6-3/4" deep bowl, 304 stainless steel construction, requires splash mounted faucet, deep-drawn seamless design-positive drain, inverted "V" edge, NSF
2. Model E44 Punching extra faucet holes or changing location of faucet holes from standard
3. Model -LRS Left & right side splashes
4. T&S Brass Model EC-3105 ChekPoint™ Electronic Faucet, wall mount, 4" centers, rigid gooseneck spout, 2.2 GPM vandal resistant aerator, AC/DC control module with internal flow control, temperature control mixing valve with integral check valves, chrome-plated brass, flexible stainless steel supply hoses, ADA Compliant

ITEM #14 HEATED HOLDING PROOFING CABINET, MOBILE

Quantity: One (1)
Prime Spec: Metro
Alternates: Hatco, FWE
Model: C599-NDC-U

1. Model C599-NDC-U C5™ 9 Series Controlled Humidity Heated Holding & Proofing Cabinet, mobile, full height, clear double panel tempered glass Dutch doors, universal wire slides, capacity (17) 18" x 26" or (34) 12" x 20" x 2-1/2" pans, 3" OC (adjustable on 1-1/2" increments), aluminum, 5" casters, polymer bumper & drip trough combination, 120v/60/1-PH, 2000 watts, 16 amps, NEMA 5-20P, cULus, NSF
2. 1 year warranty against manufacturing defects

ITEM #15 CONDENSATE HOOD

Quantity: One (1)
Prime Spec: Captive-Aire
Alternates: None
Model: 6030VHB-G-ACPSP-F

1. Model 6030VHB-G-ACPSP-F 15ft 0" Long Condensate Hood, w/ Full Perimeter Gutter, With Perforated Supply Plenum - 12" Wide Front, 430 SS, Utility cabinet on left side, Complete ACPSP w/ LED Lights, top closure panels and stainless backsplash, DCV-2011 electrical package installed at factory, right and left vertical panels.
2. Model DU85HFHA High Speed Direct Drive Centrifugal Upblast Exhaust Fan with speed control; includes curb and hinged base
3. Model A2-D.250-20D-MPU Gas fired heated make up air unit with 5 ton cooling; rail and curb included.
4. Model SDV Service Design Verification for CASLink, DCV Controls, Fans, MUA and hood. Includes training and travel to jobsite

ITEM #16 COMBI OVEN, ELECTRIC

Quantity: Six (6)
Prime Spec: Vulcan
Alternates: None
Model: ABC7E-240

1. Model ABC7E-240 Combi Oven/Steamer, electric, boilerless, (7) 18" x 26" full size sheet or (14) 12" x 20" full size hotel pan capacity, (3) knobs with LED displays for temperature, timer & humidity, auto-adjustment of humidity with temperature selection, auto-reversing fan with electronic braking system, cool to touch glass door, flashing door light and audible alert, (4) Grab n Go wire racks, stainless steel interior & exterior, engineered & assembled in USA, UL EPH Classified, cULus
2. 1 year limited parts & labor warranty, standard
3. K-12 School Nutrition extended warranty extends the warranty for 12 months beyond the 12 month Original Equipment Warranty, not to exceed 24 months from date of installation
4. 240v/60/3-ph, 57.8 amps, 24kW (field convertible to 1-ph), standard
5. Three (3) Model CB30K-SYSTEM Single Hollow Carbon Filter System, with 30,000 gallon capacity, for chlorine and chloramine reduction, sediment, bad tastes & odors, total organic compounds, tannins & trihalomethanes, ANSI/NSF 42 & 53
6. Three (3) Model STACK-ABC/E Stacking Kit, electric, for (2) ABC7E Combi, includes: vent kit, spray hose, drip tray & casters
7. Three (3) Model SPRAY-ABC Spray Hose Kit, Provided with ABC Stand or ABC Stacking Kits - includes spray handle, 8 ft. stainless steel braided hose and mounting hardware
8. Six (6) Model ADDRACK-ABC3 Additional Grab n Go Rack wire rack shelf, (3) with cutout design, stainless steel

ITEM #17 SPARE NO.

ITEM #18 SPARE NO.

ITEM #19 SPARE NO.

ITEM #20 WORK COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Custom Work Counter, 168"W x 54"D, 14/3 stainless steel top, 7"H back-to-back splash @ sink bowl locations, (2) 8" o.c. splash mount faucet hole provisions, square turndown edges, (2) 16" x 19-1/2" x 12" deep sink bowls, (2) stainless steel twist brackets, 18/3 stainless steel cabinet body, hinged doors @ sink bowl locations, (2) 3- tier drawer assemblies, (4) open base provisions, partial stainless steel intermediate shelves where applicable, stainless steel removable panels, stainless steel fixed bottom shelf where applicable, integral utility chase, partial stainless steel curb base @ water stub up location, stainless steel legs and adjustable bullet feet. (1) overself @ microwave location, (1) double over shelf, 90" O.A.L., 20"D top shelf, 10"D bottom shelf, stainless steel tubular supports and flag brackets, Custom counter includes (4) duplex receptacles prewired to a load center, final connections to be made in the field by Others.
2. Two (2) T&S Brass Model B-2342 Faucet, wall mount, 8" centers, 10" swing nozzle, lever handles
3. Two (2) T&S Brass Model B-3972 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet

ITEM #21 MICROWAVE OVEN

Quantity: One (1)
Prime Spec: ACP
Alternates: Panasonic, Sharp
Model: RMS10DSA

1. Model RMS10DSA Amana® Commercial Microwave Oven, 0.8 cu. ft. capacity, 1000 watts, low volume, single stage cooking, (1) power level, lighted control dial, 6-minute max cooking time, interlock safety switch, audible end of cycle signal, side hinged door with tempered glass, LED lighted interior, stainless steel interior & exterior, 120v/60/1-ph, 13.0 amps, 15 MCA, 1500 watts (total), cord, NEMA 5-15P, cETLus, ETL-Sanitation
2. 3-year limited warranty (1 year full)

ITEM #22 HOT WATER DISPENSER

Quantity: One (1)
Prime Spec: Hatco
Alternates: None
Model: AWD-12

1. Model AWD-12 Atmospheric Hot Water Dispenser, countertop design, 12-gallon capacity, automatic fill, pushbutton portion control, low water cut-off, electronic temp. control with digital display, red & white granite powder coated body, stainless steel tank, shelf & base, 4" legs, cULus, UL EPH Classified, Made in USA
2. NOTE: Sale of this product must comply with Hatco's Minimum Resale Price Policy; consult order acknowledgement for details
3. NOTE: Includes 24/7 parts & service assistance, call 800-558-0607
4. 208v/60/1-ph, 5.0 kW
5. Standard plug NEMA 6-30P

ITEM #23 BUSSING UTILITY TRANSPORT CART, METAL

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: UUC-422

1. Model UUC-422 Utility Cart, 3-tier, 19"W x 31"D x 32"H, 1" upturn on all sides of all shelves, 12-1/2" shelf clearance, (1) push handle, angle legs include bumpers, 500 lbs. capacity, 430 stainless steel all welded construction, 4" swivel plate casters, NSF

ITEM #24 WIRE SHELVING

Quantity: Six (6)
Prime Spec: Metro
Alternates: Eagle
Model: A2448NK3

1. Twenty (20) Model A2448NK3 Super Adjustable Super Erecta® Shelf, wire, 48"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
2. Eight (8) Model A2436NK3 Super Adjustable Super Erecta® Shelf, wire, 36"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
3. Twenty Eight (28) Model 70UPK3 Super Erecta® SiteSelect™ Post, 69-3/4"H, for use with stem casters, Metroseal 3 epoxy coated corrosion-resistant finish with Microban® antimicrobial protection
4. Fourteen (14) Model 5MP Super Erecta® Stem Caster, swivel, 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper
5. Fourteen (14) Model 5MPB Super Erecta® Stem Caster, swivel (with foot operated brake), 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper

ITEM #25 WALK IN COOLER/FREEZER COMPLEX

Quantity: One (1)
Prime Spec: Kolpak
Alternates: Bally, Thermalrite
Model: WALK IN

1. Model WALK IN - LS Walk In Cooler/Freezer complex, dimensioned per plan, 8'-6" exterior height with floor, recessed in 4" pit - refer to walk in detail in FS Drawings. LED Lighting, White interior, Stainless Steel exterior where visible, view port in cooler/freezer door, closure panels and trim strips provided by KEC to match finishes of walk in.

ITEM #26 REFRIGERATION SYSTEM, REMOTE

Quantity: One (1)
Prime Spec: Kolpak
Alternates: Bally, Thermalrite
Model: FREEZER REFRIGERATION

1. Model FREEZER REFRIGERATION Low Temperature Air Cooled walk in refrigeration including pre-charged condenser and evaporator coil. 5 year extended warranty to be included

ITEM #27 REFRIGERATION SYSTEM, REMOTE

Quantity: One (1)
Prime Spec: Kolpak
Alternates: Bally, Thermalrite
Model: COOLER REFRIGERATION

1. Model COOLER REFRIGERATION Medium Temperature Air Cooled walk in refrigeration including pre-charged condenser and evaporator coil. 5 year extended warranty to be included

ITEM #28 SPARE NO.

ITEM #29 SPARE NO.

ITEM #30 WIRE SHELVING

Quantity: Ten (10)
Prime Spec: Metro
Alternates: Eagle
Model: A2448NK3

1. Twenty (20) Model A2448NK3 Super Adjustable Super Erecta® Shelf, wire, 48"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
2. Twelve (12) Model A2442NK3 Super Adjustable Super Erecta® Shelf, wire, 42"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
3. Eight (8) Model A2436NK3 Super Adjustable Super Erecta® Shelf, wire, 36"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
4. Forty (40) Model 74PK3 Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 epoxy coated corrosion-resistant finish with Microban® antimicrobial protection
5. One (1) Model HP2236PD Metro Bow-Tie™ Dunnage Rack, 22" x 36" x 12"H, slotted, with separate polymer tie for joining racks, corrosion proof polymer construction, NSF

ITEM #31 WIRE SHELVING

Quantity: Ten (10)
Prime Spec: Metro
Alternates: Eagle
Model: A2448NK3

1. Forty (40) Model A2448NK3 Super Adjustable Super Erecta® Shelf, wire, 48"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
2. Twelve (12) Model A2442NK3 Super Adjustable Super Erecta® Shelf, wire, 42"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
3. Eight (8) Model A2436NK3 Super Adjustable Super Erecta® Shelf, wire, 36"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
4. Forty (40) Model 74PK3 Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 epoxy coated corrosion-resistant finish with Microban® antimicrobial protection
5. One (1) Model HP2236PD Metro Bow-Tie™ Dunnage Rack, 22" x 36" x 12"H, slotted, with separate polymer tie for joining racks, corrosion proof polymer construction, NSF

ITEM #32 SPARE NO.

ITEM #33 NESTING PAN RACK

Quantity: Thirteen (13)
Prime Spec: Channel Manufacturing
Alternates: Advance Tabco, Elkay
Model: 401AN

1. Model 401AN Bun Pan Rack, Nesting, mobile, 20-1/2"W x 26"D x 70-1/4"H, front load, open sides, 3" spacing, capacity (20) 18" x 26" bun pans, welded aluminum construction, 5" swivel casters, NSF, Made in USA (published shipping weight does not reflect 50lb. pallet)
2. 5-year warranty on parts and 90 days labor, standard
3. Lifetime warranty against rust and corrosion
4. Model /011 Caster Brakes (set of 2)

ITEM #34 WORK COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Custom Work Counter, 150"W x 54"D, 14/3 stainless steel top, 7"H back-to-back splash @ sink bowl locations, (2) 8" o.c. splash mount faucet hole provisions, square turndown edges, (2) 16" x 19-1/2" x 12" deep sink bowls, (2) stainless steel twist brackets, 18/3 stainless steel cabinet body, hinged doors @ sink bowl locations, (2) 3- tier drawer assemblies, (4) open base provisions, partial stainless steel intermediate shelves where applicable, stainless steel removable panels, stainless steel fixed bottom shelf where applicable, integral utility chase, partial stainless steel curb base @ water stub up location, stainless steel legs and adjustable bullet feet. Custom counter includes (4) duplex receptacles prewired to a load center, final connections to be made in the field by Others.
2. Two (2) T&S Brass Model B-2342 Faucet, wall mount, 8" centers, 10" swing nozzle, lever handles
3. Two (2) T&S Brass Model B-3972 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet

ITEM #35 PLANETARY MIXER

Quantity: One (1)
Prime Spec: Hobart
Alternates: None
Model: HL400-1STD

1. Model HL400-1STD 200-240/50/60/3 Mixer; with bowl, beater, whip, & spiral dough arm; US/EXP configuration - Legacy Planetary Mixer, 1.5 hp, 40 quart capacity, (3) fixed speeds, gear-driven transmission, 20 minute timer, #12 taper attachment hub, manual bowl lift, bowl guard, stainless steel bowl, "B" beater, "D" whip, "ED" dough hook
2. Standard warranty: 1-Year parts, labor & travel time during normal working hours within the USA
3. K-12 School Nutrition extended warranty extends the warranty for 12 months beyond the 12 month Original Equipment Warranty, not to exceed 24 months from date of installation

ITEM #36 WORK TABLE, STAINLESS STEEL TOP

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, 96"W x 30"D, 14/300 series stainless steel top, 6"H backsplash w/ rear turndown and Z-clips, (1) 8" o.c. splash mount faucet hole provisions, square turndown edges, Uni-Lok® gusset system, (1) 18" x 20" x 14" deep sink bowls, stainless steel apron @ sink bowl location, (1) stainless steel twist bracket, partial adjustable 18/300 series stainless steel undershelf with marine edge, stainless steel legs & adjustable bullet feet, NSF
2. T&S Brass Model B-0133-12-CRB8P EasyInstall DuraPull Pre-Rinse Unit, 8" adjustable wall mount, add-on faucet, 12" swing nozzle with Series 1 stream regulator outlet, quarter-turn Cerama cartridges with check valves, lever handles with color coded indexes, 12" riser, 6" wall bracket, stainless steel pull-down activated valve unit with 1.07 GPM insulated grip handle blue sprayer, 30" flexible stainless steel hose, 1/2" NPT female inlets, cCSAus, low lead
3. T&S Brass Model B-3972 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet

ITEM #37 SPARE NO.

ITEM #38 SPARE NO.

ITEM #39 SPARE NO.

ITEM #40 WIRE SHELVING

Quantity: Four (4)
Prime Spec: Metro
Alternates: Eagle
Model: A2448NK3

1. Sixteen (16) Model A2448NK3 Super Adjustable Super Erecta® Shelf, wire, 48"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
2. Sixteen (16) Model 70UPK3 Super Erecta® SiteSelect™ Post, 69-3/4"H, for use with stem casters, Metroseal 3 epoxy coated corrosion-resistant finish with Microban® antimicrobial protection
3. Eight (8) Model 5MP Super Erecta® Stem Caster, swivel, 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper
4. Eight (8) Model 5MPB Super Erecta® Stem Caster, swivel (with foot operated brake), 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper

ITEM #41 FOUR (4) COMPARTMENT SINK

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Four Compartment Sink, 174"W x 31"D, 14/304 stainless steel top, 10"H backsplash w/ rear turndown and Z-clips, (3) 8" o.c. splash mount faucet hole provisions, 30" left-hand and 36" right-hand drainboards, rolled edges on front & sides, (4) 24" x 24" x 14" deep compartments, includes 3-1/2" basket drains, stainless steel crossbracing on all sides, stainless steel legs & adjustable bullet feet, NSF
2. Model E41 Disposal provision package, includes weldment only for collar which are furnished by others, control panel bracket weldment, & holes for pre-rinse & anti-siphon vacuum breaker
3. Two (2) T&S Brass Model B-0291 Kettle & Pot Sink Faucet, Big-Flo, wall mounted 8" centers, 3/4" IPS model LL street EL inlets with locknuts, 18" swing nozzle, 175°F four arm handles, 1-1/4" dia. holes required in backsplash
4. One (1) T&S Brass Model B-0133-12-CRB8P EasyInstall DuraPull Pre-Rinse Unit, 8" adjustable wall mount, add-on faucet faucet, 12" swing nozzle with Series 1 stream regulator outlet, quarter-turn Cerama cartridges with check valves, lever handles with color coded indexes, 12" riser, 6" wall bracket, stainless steel pull-down activated valve unit with 1.07 GPM insulated grip handle blue sprayer, 30" flexible stainless steel hose, 1/2" NPT female inlets, cCSAus, low lead
5. Three (3) T&S Brass Model B-3972 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet

ITEM #42 DISPOSER

Quantity: One (1)
Prime Spec: Salvajor
Alternates: None
Model: 200-SA-6-MRSS

1. Model 200-SA-6-MRSS Disposer, Sink Assembly, 6-1/2" sink collar, 2 Hp motor, start/stop push button manual reversing MRSS control, includes fixed nozzle, chrome plated vacuum breaker, solenoid valve, sink stopper & flow control, heat treated aluminum alloy housing, UL, CSA, CE (**Effective 6-1-17 all MRSS control panel dimensions will be 9-1/4" x 10-1/4" x 5-7/16"**)
2. 208v/60/3-ph, 6.6 amps

ITEM #43 EYE WASH STATION

Quantity: One (1)
Prime Spec: T&S Brass
Alternates: Fisher
Model: EW-7656WC

1. Model EW-7656WC Eyewash Unit, recessed, wall mounted, 32"H x 14"W x 5"D, single valve with strainer, 4.2 gpm flow control, polished chrome-plated brass valve, stainless steel housing, 1/2" NPT inlet, 2" NPT waste outlet, cCSAus
2. Model EC-TMV Thermostatic Mixing Valve, 1/2" NPS male fittings

ITEM #44 REEL KLEEN CONTROL CABINET

Quantity: One (1)
Prime Spec: T&S Brass
Alternates: Fisher
Model: B-2339-LR

1. Model B-2339-LR Hose Reel Control Cabinet, with control valve & temperature gauge & dual check valves
2. Model B-7133-06 Hose Reel System, open, 1/2" x 35' hose with stainless steel front trigger spray valve (with a 7/16" orifice), with ratcheting system & adjustable hose bumper, stainless steel
3. 1 year limited warranty for hose, standard
4. 2 year limited warranty for hose reel, standard

ITEM #45 SOILED DISHTABLE

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Soiled Dishtable, straight design, 210"W x 30"D, right-to-left operation, 14/304 stainless steel top, 10"H backsplash w/ rear turndown and Z-clips, raised rolled edges on front & side, 48" pass-thru, 108" scrapping trough, (2) gusher heads, stainless steel legs & side bracing, adjustable feet, NSF
2. Model E41B Provision for scrap collector & trough veyor
3. Model E108 Field joint, bolted or ready for field welding by others, 14/304 stainless steel

ITEM #46 DISPOSAL SYSTEM

Quantity: One (1)
Prime Spec: Salvajor
Alternates: None
Model: 300-TVR

1. Model 300-TVR TroughVeyor, food waste conveying & disposing system with water recirculation, right-hand operation, 3 HP disposer, with trough diffuser, salvage basin & silverware trap, stainless steel construction, with start/stop push button auto reversing control & safety line disconnect
2. 208v/60/3-ph, 12.7 amps
3. Two (2) Model 988001 Gusher head assembly for TVL, TVR & S419
4. Model RSS Remote start/stop switch for all controls (HydroLogic control with operator sensor comes standard mounted to SM/PSM models. ONLY add if additional on/off control is required)

ITEM #47 DISHWASHER, CONVEYOR TYPE

Quantity: One (1)
Prime Spec: Hobart
Alternates: None
Model: CL64EN-BAS+BUILDUP

1. Model CL64EN-BAS+BUILDUP Conveyor Dishwasher, (2) tank, (342) racks/hour, insulated hinged doors, .39 gallon/rack, stainless steel enclosure panels, controls with low temperature & dirty water indicators, NSF Pot & Pan mode, programable de-lime notification, ENERGY STAR®, Free factory startup for installations within a 100 mile radius of a Hobart service office; installation beyond 100 miles will be charged at the quoted rate by the local Hobart service office
2. Standard warranty - 1-Year parts, labor & travel time during normal working hours within the USA
3. Model CL64EN-BASELE0AX 208v/60/3-ph, electric heat only
4. Model CL64EN-BASHT15K Electric tank heat 15kW wash/10kW rinse
5. Model CL64EN-BASERH30K 30kW electric booster
6. Model CL64EN-BASDIR0RL Right to left operation
7. Model BDERLAX-STDDOM Standard height, domestic, Blower Dryer Electric, 208/60/3 R-L
8. NOTE: When blower dryer is selected, only (1) E Series vent hood (below) needed for load/soiled side vent connection; Blower Dryer assembly includes vent stack for unload/clean side vent connection. CLeN Blower Dryer
9. Installation by local Hobart Service Office if within 100 mile radius & done during normal business hours. 72 Hour Assembly Notice Recommended. Must be ordered with Hobart Dishmachine. Price includes assembly of blower dryer to Hobart dishmachine ONLY. Installation of dishmachine can be by others. Does not include drain connection.
10. Model CL64EN-BASHGTSTD Standard height
11. Model CL64EN-BASFETSTD Standard feet
12. NOTE: For water over 3-grains of hardness, Hobart suggests adding a water softener.
13. Model VNTHD/E-ADJ E-series vent hood domestic (adjustable)
14. Model DISHRAK-P1400 Rack, peg type with one side open (tray/sheet pan rack)
15. Model CLE/TBL-SWITCH Table limit switch CLE-Series

ITEM #48 CLEAN DISHTABLE

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Spec-Master® Clean Dishtable, straight design, 144"W x 30"D, right-to-left operation, 14/304 stainless steel top, 10"H backsplash w/ rear downturn and Z-clips, raised rolled edges on front & side, stainless steel legs & crossbracing, adjustable metal feet, NSF
2. Model E120 Table limit switch provision (switch by others)

ITEM #49 FLOOR TROUGH

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: FT-1260-SG

1. Model FT-1260-SG Floor Trough, 60"W x 12"D, stainless steel subway-style grating, 4" deep trough pan with built-in pitch toward drain, accommodates up to 4" drain pipe, stainless steel removable perforated basket, 1" outer flange for mounting, all-welded 14/304 stainless steel construction, NSF

ITEM #50 RACK DOLLY

Quantity: Three (3)
Prime Spec: Cambro
Alternates: Vollrath
Model: CDR2020H151

1. Model CDR2020H151 Camdolly® for Camracks, 23-3/8"L x 21-3/8"W x 37"H (exterior dimensions), with handle, platform design, (4) swivel 3-1/2" casters, no brakes, lightweight, durable, soft gray polypropylene

ITEM #51 SPARE NO.

ITEM #52 SPARE NO.

ITEM #53 SPARE NO.

ITEM #54 ROLL-THRU HEATED CABINET

Quantity: One (1)
Prime Spec: Delfield
Alternates: True, Victory
Model: GAHRT2-S

1. Model GAHRT2-S Specification Line® Heated Cabinet, Roll-Thru, two-section, 80.5 cubic feet capacity, (4) full-height hinged solid doors (locking), 4.3" easyTouch® screen temperature display/control with remote monitoring, incandescent interior lighting, 1" tall stainless steel ramp, stainless steel exterior front, sides & interior, 208-240v/60/1-ph, 10.5 amps, NEMA 6-20P, NSF, cULus, ENERGY STAR®
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460003CN 3 year parts & labor warranty, standard
4. Left door hinged on left, right door hinged on right, standard (Thermometer side)
5. Left door hinged on left, right door hinged on right, standard (Rear)
6. (Front) Full height solid door, standard
7. (Front) Full height solid door, standard
8. (Rear) Full height solid door, standard
9. (Rear) Full height solid door, standard
10. Model AS269-AFJ-0043 Raised Ramp, for roll in/roll thru, standard
11. KEC to supply stainless steel wall flashing as noted in drawings

ITEM #55 WORK TABLE, CABINET BASE HINGED DOORS

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with hinged doors, 65"W x 30"D, 14/304 stainless steel top, 6"H backsplash w/ rear turndown and Z-clips, 8" o.c. splash mount faucet hole provisions, square turndown front edge, Uni-Lok® gusset system, 10" x 14" x 9-1/2" deep sink bowl, stainless steel cabinet body, hinged doors, stainless steel intermediate shelves, stainless steel legs, & adjustable bullet feet, NSF
2. T&S Brass Model B-2342 Faucet, wall mount, 8" centers, 10" swing nozzle, lever handles, quarter-turn Eterna cartridges, low lead, ADA Compliant
3. T&S Brass Model B-3972 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet (replaces B-3923, B-3927)

ITEM #56 ROLL-THRU REFRIGERATOR

Quantity: One (1)
Prime Spec: Delfield
Alternates: True, Victory
Model: GARRT2P-S

1. Model GARRT2P-S Specification Line® Refrigerator, Roll-Thru, two-section, 80.5 cubic feet capacity, top-mounted self-contained refrigeration system, (4) full-height hinged solid doors (locking), 4.3" easyTouch® screen temperature display/control with remote monitoring, LED interior lighting, 1" tall stainless steel ramp, stainless steel exterior front, sides & interior, GreenGenius™ R290 Hydrocarbon refrigerant, 0.38 HP, 115v/60/1-ph, 6.5 amps, NEMA 5-15P, NSF, cULus, ENERGY STAR®
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460003CN 3 year parts & labor warranty, standard
4. Model W00003ACN 5 year compressor warranty, standard
5. Left door hinged on left, right door hinged on right, standard (Thermometer side)
6. Left door hinged on left, right door hinged on right, standard (Rear)
7. Model AS000-CTA-006P Flat stainless steel door liner left - (roll in/roll thru)
8. Model AS000-CTA-006Q Flat stainless steel door liner right- (roll in/roll thru)
9. Model AS000-CTA-006P Flat stainless steel door liner left - (roll in/roll thru)
10. Model AS000-CTA-006Q Flat stainless steel door liner right- (roll in/roll thru)
11. (Front) Full height solid door, standard
12. (Front) Full height solid door, standard
13. (Rear) Full height solid door, standard
14. (Rear) Full height solid door, standard
15. KEC to supply stainless steel wall flashing as noted in drawings

ITEM #57 ROLL-IN HEATED CABINET

Quantity: One (1)
Prime Spec: Delfield
Alternates: True, Victory
Model: GAHRI1-S

1. Model GAHRI1-S Specification Line® Heated Cabinet, Roll-In, one-section, 37.0 cubic feet capacity, (1) full-height hinged solid door (locking), 4.3" easyTouch® screen temperature display/control with remote monitoring, incandescent interior lighting, 1" tall stainless steel ramp, stainless steel exterior front, sides & interior, 208-240v/60/1-ph, 6.0 amps, NEMA 6-20P, NSF, cULus, ENERGY STAR®
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460003CN 3 year parts & labor warranty, standard
4. Door hinged on left
5. Model AS000-CTA-006P Flat stainless steel door liner left - (roll in/roll thru)
6. Full height solid door, standard
7. Model AS269-AFJ-0043 Raised Ramp, for roll in/roll thru, standard

ITEM #58 ROLL-IN REFRIGERATOR

Quantity: One (1)
Prime Spec: Delfield
Alternates: True, Victory
Model: GARRI1P-S

1. Model GARRI1P-S Specification Line® Refrigerator, Roll-In, one-section, 37.0 cubic feet capacity, top-mounted self-contained refrigeration system, (1) full-height hinged solid door (locking), 4.3" easyTouch® screen temperature display/control with remote monitoring, LED interior lighting, 1" tall stainless steel ramp, stainless steel exterior front, sides & interior, GreenGenius™ R290 Hydrocarbon refrigerant, 0.35 HP, 115v/60/1-ph, 6.0 amps, NEMA 5-15P, NSF, cULus, ENERGY STAR®
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460003CN 3 year parts & labor warranty, standard
4. Model W00003ACN 5 year compressor warranty, standard
5. Door hinged on left
6. Model AS000-CTA-006P Flat stainless steel door liner left - (roll in/roll thru)
7. Full height solid door, standard

ITEM #59 WORK TABLE, CABINET BASE HINGED DOORS

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with hinged doors, 65"W x 30"D, 14/304 stainless steel top, 6"H backsplash w/ rear turndown and Z-clips, 8" o.c. splash mount faucet hole provisions, square turndown front edge, Uni-Lok® gusset system, 10" x 14" x 9-1/2" deep sink bowl, stainless steel cabinet body, hinged doors, stainless steel intermediate shelves, stainless steel legs, & adjustable bullet feet, NSF
2. T&S Brass Model B-2342 Faucet, wall mount, 8" centers, 10" swing nozzle, lever handles, quarter-turn Eterna cartridges, low lead, ADA Compliant
3. T&S Brass Model B-3972 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet (replaces B-3923, B-3927)

ITEM #60 RAPID COOK OVEN

Quantity: One (1)
Prime Spec: Merrychef USA
Alternates: None
Model: E4S

1. Model E4S eikon™ Convection, Air Impingement and Microwave Speed Oven, ventless cooking capability, quiet operation, EasyToUCH™ controls, USB memory, built-in diagnostic testing, bottom-hinged door, includes: (1) wire rack "DV0908", (1) paddle "PSR310", (2) mesh bottom baskets "32Z4031", (1) cool down pan "32Z4028", (1) USB menu key & (1) cleaner kit "32Z148", stainless steel construction, 6.2kW, 208/240v/60/1-ph, 30 amp, NEMA 6-30P, CE, cULus, NSF, ETL
2. 1 year parts & labor warranty, standard

ITEM #61 UNDERCOUNTER REFRIGERATOR

Quantity: One (1)
Prime Spec: Delfield
Alternates: True, Victory
Model: 406-CAP

1. Model 406-CAP Undercounter Refrigerator, single-section, 27" W, 5.7 cubic feet, (1) solid door, (1) epoxy coated wire shelf, stainless steel front & sides, aluminum sub-top, black recessed handle, ABS interior, 3" casters, rear-mounted refrigeration system, R290 Hydrocarbon refrigerant, 1/5 HP, NSF, cUL, UL
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460003CN 3 year parts & labor warranty, standard
4. Model W00003ACN 5 year compressor warranty, standard
5. 115v/60/1-ph, 4.0 amps, NEMA 5-15P, standard
6. Self-contained refrigeration, standard
7. Door hinged on left

ITEM #62 ROLL-THRU HEATED CABINET

Quantity: One (1)
Prime Spec: Delfield
Alternates: True, Victory
Model: GAHRT1-S

1. Model GAHRT1-S Specification Line® Heated Cabinet, Roll-Thru, one-section, 39.0 cubic feet capacity, (2) full-height hinged solid doors (locking), 4.3" easyTouch® screen temperature display/control with remote monitoring, incandescent interior lighting, 1" tall stainless steel ramp, stainless steel exterior front, sides & interior, 208-240v/60/1-ph, 6.0 amps, NEMA 6-20P, NSF, cULus, ENERGY STAR®
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460003CN 3 year parts & labor warranty, standard
4. Door hinged on left (Thermometer side)
5. Door hinged on left (Rear)
6. Model AS269-AFJ-0043 Raised Ramp, for roll in/roll thru, standard
7. Model AF000CTA006F Full height glass door in lieu of stainless
8. KEC to supply stainless steel wall flashing as noted in drawings

ITEM #63 REFRIGERATED MERCHANDISER

Quantity: One (1)
Prime Spec: True Manufacturing Co., Inc.
Alternates: Delfield, Victory
Model: GDM-69-HC-LD

1. Model GDM-69-HC-LD Refrigerated Merchandiser, three-section, (12) shelves, (3) Low-E thermal glass sliding doors, LED interior lights, powder coated steel exterior, white interior with stainless steel floor, leg levelers, R290 Hydrocarbon refrigerant, 1/2 HP, 115v/60/1-ph, NEMA 5-15P, 9.3 amps, cULus, UL EPH Classified, Made in USA
2. NOTE: Commonly stocked model in black exterior, and white exterior; verify availability with factory
3. Self-contained refrigeration standard
4. Warranty - 7 year compressor (self-contained only), please visit www.Truemfg.com for specifics (updated warranty sheet pending from True)
5. Warranty - 3 year parts and labor, please visit www.Truemfg.com for specifics
6. Exterior: Stainless steel
7. Interior: White aluminum, standard
8. Model S-PW Sign, Plain White in lieu of standard
9. Castors, 4" set of 6

ITEM #64 WIRE SHELVING

Quantity: One (1)
Prime Spec: Metro
Alternates: Eagle
Model: A1460NC

1. Four (4) Model A1460NC Super Adjustable Super Erecta® Shelf, wire, 60"W x 14"D, chrome plated finish, plastic split sleeves are included in each carton, corner release system, NSF
2. Four (4) Model 74UP Super Erecta® Post, 73-7/8"H, for use with stem casters, chrome plated finish
3. Two (2) Model 5MP Super Erecta® Stem Caster, swivel, 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper
4. Two (2) Model 5MPB Super Erecta® Stem Caster, swivel (with foot operated brake), 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper

ITEM #65 WORK TABLE, STAINLESS STEEL TOP

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, 113"W x 24"D, 14/300 series stainless steel top, 6"H backsplash w/ rear turndown, left & right end splashes, square turndown edges, Uni-Lok® gusset system, integral 94"W stainless steel pass-thru w/ square turndown front edge, (2) adjustable 18/300 series stainless steel undershelf with marine edge, (6) stainless steel legs & adjustable bullet feet, NSF

ITEM #66 POS SYSTEM

1. By Owner - NIKEC

ITEM #67 ESPRESSO CAPPUCCINO MACHINE

Quantity: One (1)
Prime Spec: Franke
Model: A400 FM

By Owner - NIKEC

ITEM #68 SPARE NO.

ITEM #69 SPARE NO.

ITEM #70 SPARE NO.

ITEM #71 FLATWARE & TRAY CART

Quantity: Seven (7)
Prime Spec: Lakeside Manufacturing
Alternates: Advance Tabco, Elkay
Model: 403

1. Model 403 Tray & Silver Cart, accepts (10) flatware cylinders (not included), for (120) 16" x 22" trays, stainless steel construction, stainless steel angle frame with push handle, 500 lb. load capacity, 5" swivel casters, Made in USA
2. Casters, 5", cushion tread, all swivel, standard
3. Wall-Saver strip bumpers

ITEM #72 HOT/COLD COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with open front, 14'W x 36"D, 14/304 stainless steel top, square turndown edges, Uni-Lok® gusset system, 14'W x 12"D solid ribbed tray slide w/ drop-down brackets, sneeze guard provisions, top cutouts w/ reinforcement fro drop-in equipment by others, stainless steel apron for mounting hot well controls, Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Drop-In Cold Well. Receptacle and Sneeze Guard Lights Pre-Wired To Junction Box for Final Connections in the Field by Others.

ITEM #73 SNEEZE GUARD, STATIONARY

Quantity: One (1)
Prime Spec: Premier Metal & Glass
Alternates: BSI
Model: TM2N-A

1. Model TM2N-A CHOICE™ Adjustable Dual-Service Sneeze Guard, single sided guard with top shelf, 3/8" tempered glass with polished edges, adjustable end panels where required, table mount, 1" OD round stainless support posts, NSF & cULus Listed
2. Sized per plan
3. GRNM Hatco, narrow max watt heat lamp over hot well & Ultra-Slim LED lights
4. Model CRATING Breath Guard crating as required per MFG.

ITEM #74 HOT FOOD WELL UNIT, DROP-IN, ELECTRIC

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: N8759-D

1. Model N8759-D Drop-In Hot Food Well Unit, Electric, individual pans, wet/dry type with drain & manifold, 4-pan size for 12" x 20" pans, individual infinite temperature controls, stainless steel top & wells, galvanized outer liner, (58-1/2" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. 208-230v/60/1-ph, 20.0-22.0 amps, standard
5. Model 000-504-0031 Autofill assembly kit (shipped loose), for N8700 series

ITEM #75 COLD FOOD WELL UNIT, DROP-IN, REFRIGERATED

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: 8145-EFP

1. Model 8145-EFP LiquiTec® Drop-In Cool Food Unit, 3-pan size, 4" or 6" deep pans flush with counter top, insulated pan, stainless steel inner liner & top, galvanized outer liner, self-contained Eutectic fluid refrigerated system, R290 Hydrocarbon refrigerant, 1/4 hp, (44-1/4" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. Model W00003A 5 year compressor warranty (NET)
5. 115v/60/1-ph, 3.7 amps, NEMA 5-15P, standard

ITEM #76 HOT/COLD COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with open front, 14'-6"W x 36"D, 14/304 stainless steel top, square turndown edges, mitered corner, Uni-Lok® gusset system, 14'-6"W x 12"D solid ribbed tray slide w/ drop-down brackets, sneeze guard provisions, top cutouts w/ reinforcement fro drop-in equipment by others, stainless steel apron for mounting hot well controls, Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Drop-In Cold Well. Receptacle and Sneeze Guard Lights Pre-Wired To Junction Box for Final Connections in the Field by Others.

ITEM #77 SNEEZE GUARD, STATIONARY

Quantity: One (1)
Prime Spec: Premier Metal & Glass
Alternates: BSI
Model: TM2N-A

1. Model TM2N-A CHOICE™ Adjustable Dual-Service Sneeze Guard, single sided guard with top shelf, 3/8" tempered glass with polished edges, adjustable end panels where required, table mount, 1" OD round stainless support posts, NSF & cULus Listed
2. Sized per plan
3. GRNM Hatco, narrow max watt heat lamp over hot well & Ultra-Slim LED lights

ITEM #78 HOT FOOD WELL UNIT, DROP-IN, ELECTRIC

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: N8759-D

1. Model N8759-D Drop-In Hot Food Well Unit, Electric, individual pans, wet/dry type with drain & manifold, 4-pan size for 12" x 20" pans, individual infinite temperature controls, stainless steel top & wells, galvanized outer liner, (58-1/2" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. 208-230v/60/1-ph, 20.0-22.0 amps, standard
5. Model 000-504-0031 Autofill assembly kit (shipped loose), for N8700 series

ITEM #79 COLD FOOD WELL UNIT, DROP-IN, REFRIGERATED

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: 8145-EFP

1. Model 8145-EFP LiquiTec® Drop-In Cool Food Unit, 3-pan size, 4" or 6" deep pans flush with counter top, insulated pan, stainless steel inner liner & top, galvanized outer liner, self-contained Eutectic fluid refrigerated system, R290 Hydrocarbon refrigerant, 1/4 hp, (44-1/4" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. Model W00003A 5 year compressor warranty (NET)
5. 115v/60/1-ph, 3.7 amps, NEMA 5-15P, standard

ITEM #80 HOT/COLD COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with open front, 13'-6"O.A.W. x 36"D, mitered design, 14/304 stainless steel top, square turndown edges Uni-Lok® gusset system, 13'-6"W x 12"D solid ribbed tray slide w/ drop-down brackets (mitered), sneeze guard provisions, top cutouts w/ reinforcement fro drop-in equipment by others, stainless steel apron for mounting hot well controls, Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Drop-In Cold Well. Receptacle and Sneeze Guard Lights Pre-Wired To Junction Box for Final Connections in the Field by Others.

ITEM #81 SNEEZE GUARD, STATIONARY

Quantity: One (1)
Prime Spec: Premier Metal & Glass
Alternates: BSI
Model: TM2N-A

1. Model TM2N-A CHOICE™ Adjustable Dual-Service Sneeze Guard, single sided guard with top shelf, 3/8" tempered glass with polished edges, adjustable end panels where required, table mount, 1" OD round stainless support posts, NSF & cULus Listed
2. Sized per plan, 2 units
3. GRNM Hatco, narrow max watt heat lamp over hot well & Ultra-Slim LED lights

ITEM #82 HOT FOOD WELL UNIT, DROP-IN, ELECTRIC

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: N8759-D

1. Model N8759-D Drop-In Hot Food Well Unit, Electric, individual pans, wet/dry type with drain & manifold, 4-pan size for 12" x 20" pans, individual infinite temperature controls, stainless steel top & wells, galvanized outer liner, (58-1/2" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. 208-230v/60/1-ph, 20.0-22.0 amps, standard
5. Model 000-504-0031 Autofill assembly kit (shipped loose), for N8700 series

ITEM #83 COLD FOOD WELL UNIT, DROP-IN, REFRIGERATED

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: 8145-EFP

1. Model 8145-EFP LiquiTec® Drop-In Cool Food Unit, 3-pan size, 4" or 6" deep pans flush with counter top, insulated pan, stainless steel inner liner & top, galvanized outer liner, self-contained Eutectic fluid refrigerated system, R290 Hydrocarbon refrigerant, 1/4 hp, (44-1/4" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. Model W00003A 5 year compressor warranty (NET)
5. 115v/60/1-ph, 3.7 amps, NEMA 5-15P, standard

ITEM #84 COLD COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base, 4'-6"O.A.W. x 36"D, 14/304 stainless steel top, square turndown edges Uni-Lok® gusset system, (2) 4'-6"W x 12"D solid ribbed tray slide w/ drop-down brackets, sneeze guard provisions, top cutout w/ reinforcement fro drop-in equipment by others, Premium laminated stainless steel cabinet body (Laminated Front, Rear & Ends), removable lift-off panels, stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Drop-In Cold Well. Receptacle and Sneeze Guard Lights Pre-Wired To Junction Box for Final Connections in the Field by Others.

ITEM #85 SNEEZE GUARD, STATIONARY

Quantity: One (1)
Prime Spec: Premier Metal & Glass
Alternates: BSI
Model: TM2N-A

1. Model TM2N-A CHOICE™ Adjustable Dual-Service Sneeze Guard, single sided guard with top shelf, 3/8" tempered glass with polished edges, adjustable end panels where required, table mount, 1" OD round stainless support posts, NSF & cULus Listed
2. Sized per plan
3. Ultra-Slim LED lights

ITEM #86 COLD FOOD WELL UNIT, DROP-IN, REFRIGERATED

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: 8145-EFP

1. Model 8145-EFP LiquiTec® Drop-In Cool Food Unit, 3-pan size, 4" or 6" deep pans flush with counter top, insulated pan, stainless steel inner liner & top, galvanized outer liner, self-contained Eutectic fluid refrigerated system, R290 Hydrocarbon refrigerant, 1/4 hp, (44-1/4" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. Model W00003A 5 year compressor warranty (NET)
5. 115v/60/1-ph, 3.7 amps, NEMA 5-15P, standard

ITEM #87 HOT/COLD COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base, 4'-6"O.A.W. x 36"D, 14/304 stainless steel top, square turndown edges Uni-Lok® gusset system, (2) 4'-6"W x 12"D solid ribbed tray slide w/ drop-down brackets, sneeze guard provisions, top cutout w/ reinforcement fro drop-in equipment by others, Premium laminated stainless steel cabinet body (Laminated Front, Rear & Ends), removable lift-off panels, stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Drop-In Hot/Cold Well. Receptacle and Sneeze Guard Lights Pre-Wired To Junction Box for Final Connections in the Field by Others.

ITEM #88 SNEEZE GUARD, STATIONARY

Quantity: One (1)
Prime Spec: Premier Metal & Glass
Alternates: BSI
Model: TM2N-A

1. Model TM2N-A CHOICE™ Adjustable Dual-Service Sneeze Guard, single sided guard with top shelf, 3/8" tempered glass with polished edges, adjustable end panels where required, table mount, 1" OD round stainless support posts, NSF & cULus Listed
2. Sized per plan, 2 units
3. GRNM Hatco, narrow max watt heat lamp over hot well & Ultra-Slim LED lights

ITEM #89 HOT / COLD FOOD WELL UNIT, DROP-IN, ELECTRIC

Quantity: Two (2)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: 1042G

1. Model 1042G Drop-In Hot/Cold Food Well, 3-pan size for 12" x 20" pans, 8" deep single tank with drain, remote control panel, individually controlled combo hot/cold, stainless steel top & well, galvanized steel exterior housing, self-contained refrigeration, cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 046000N 1 year parts & labor warranty, standard
4. Model W00003A 5 year compressor warranty (NET)
5. 120v/60/1-ph, 25.0 amps, standard
6. Model 000-504-0030 Autofill assembly kit (shipped loose), for N8600 and N8800 series

ITEM #90 COLD COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with sliding doors, 10'W x 30"D, 14/304 stainless steel top, square turndown edges, 6"H backsplash, Uni-Lok® gusset system, 10'W x 12"D solid ribbed tray slide w/ drop-down brackets, sneeze guard provisions, top cutout w/ reinforcement for drop-in equipment by others, Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel intermediate shelf where applicable, stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Drop-In Cold Well. Receptacle and Sneeze Guard Lights Pre-Wired To Junction Box for Final Connections in the Field by Others.

ITEM #91 SNEEZE GUARD, STATIONARY

Quantity: One (1)
Prime Spec: Premier Metal & Glass
Alternates: BSI
Model: TM2N-A

1. Model TM2N-A CHOICE™ Adjustable Dual-Service Sneeze Guard, single sided guard with top shelf, 3/8" tempered glass with polished edges, adjustable end panels where required, table mount, 1" OD round stainless support posts, NSF & cULus Listed
2. Sized per plan, 2 units
3. Ultra-Slim LED lights

ITEM #92 COLD FOOD WELL UNIT, DROP-IN, REFRIGERATED

Quantity: One (1)
Prime Spec: Delfield
Alternates: LTI, Atlas
Model: 8132-EFP

1. Model 8132-EFP LiquiTec® Drop-In Cool Food Unit, 2-pan size, 4" or 6" deep pans flush with counter top, insulated pan, stainless steel inner liner & top, galvanized outer liner, self-contained Eutectic fluid refrigerated system, R290 Hydrocarbon refrigerant, 1/5 hp, (30-3/4" x 25" cutout required), cUL, UL, NSF
2. NOTE: Freight quotes are only valid from Delfield
3. Model 0460000N 1 year parts & labor warranty, standard
4. Model W00003A 5 year compressor warranty (NET)
5. 115v/60/1-ph, 2.4 amps, NEMA 5-15P, standard

ITEM #93 DISPLAY MERCHANDISER, HEATED, FOR MULTI-PRODUCT

Quantity: One (1)
Prime Spec: Hatco
Alternates: None
Model: GR2SDS-42D

1. Model GR2SDS-42D Glo-Ray® Designer Slant Display Warmer, countertop, (2) shelves with (16) rods, adjustable thermostat, pre-focused infrared top heat, incandescent light, hardcoat aluminum base, tempered glass end panels, designer panels & corner caps, 4" legs, cULus, UL EPH Classified, Made in USA
2. NOTE: Sale of this product must comply with Hatco's Minimum Resale Price Policy; consult order acknowledgement for details
3. NOTE: Includes 24/7 parts & service assistance, call 800-558-0607
4. One year on-site parts & labor warranty, plus one additional year parts only warranty on all Glo-Ray metal sheathed elements
5. 120/208v/60/1-ph, 2980 watts, 12.4 amps, NEMA L14-20P (domestic voltage), standard
6. Model BLACK Black, designer color (housing) (Available at time of purchase only)
7. The color selected is considered custom & is NOT returnable
8. Model STANDARD Black designer color, standard (Available at time of purchase only)
9. Model BLACK Black, designer corner cap color (Available at time of purchase only)
10. Model 2SD-DIV Additional stainless steel divider rods
11. KEC To relocate controls to front of unit

ITEM #94 SPARE NO.

ITEM #95 SPARE NO.

ITEM #96 REFRIGERATED SELF-SERVICE CASE

Quantity: Two (2)
Prime Spec: Structural Concepts
Alternates: None
Model: CO37R

1. Model CO37R Oasis® Self-Service Refrigerated Case, 36-1/4"W, 79-3/4"H, Breeze-E (Type II) with EnergyWise self-contained refrigeration system, Blue Fin coated coil, (4) non-lit adjustable metal shelves, top light, one piece formed ABS plastic tub, black interior, (2) full end panels, 4"D removable wall spacer brackets, casters, cETLus, ETL-Sanitation
2. NOTE: If GFCI is required, a GFCI breaker MUST be used in lieu of a GFCI receptacle
3. NOTE: 34" Minimum entry door clearance required (without shipping skid & with rear spacer bracket removed)
4. 1 yr. parts & labor warranty, 5 yr. compressor warranty, standard
5. Breeze-E (Type II) with EnergyWise refrigeration - NSF Type II compliant, standard
6. 110-120v/60/1ph, 15.62 amps, standard
7. 6 ft straight blade power cord NEMA 5-20P (base exit), standard
8. NOTE: Compressor air intake from front & out rear, unit MUST remain 4" from wall & front panel cannot be blocked (Not applicable with remote refrigeration option)
9. Base Support: Casters, with levelers, standard
10. Exterior: Wilsonart® or Formica® PREMIUM laminates (as noted in laminate chart on SCC website in Resources library)
11. Lower front panel: Black, standard
12. Left end panel: Full with mirrored interior, vinyl edging, standard
13. Right end panel: Full with mirrored interior, vinyl edging, standard
14. Back Panel: Solid back panel, black, painted, standard
15. Digital fahrenheit thermometer, standard
16. Add Lights (LED) to standard shelves (4)
17. Night curtain: Retractable, non-locking

ITEM #97 REFRIGERATED SELF-SERVICE CASE

Quantity: One (1)
Prime Spec: Structural Concepts
Alternates: None
Model: HMO5136R

1. Model HMO5136R Harmony® Self-Service Refrigerated Low Profile Case, 50-3/4"W, open reach-in front, Breeze™ with EnergyWise self-contained refrigeration system with evaporator pan, (1) lighted glass shelf, top light, solid back panel, black interior, black trim, (2) full end panels with mirror, laminated exterior, levelers, cETLus, ETL-Sanitation
2. NOTE: If GFCI is required, a GFCI breaker MUST be used in lieu of a GFCI receptacle
3. NOTE: 35" minimum entry door clearance required (without shipping skid)
4. 1 yr. parts & labor warranty, 5 yr. compressor warranty, standard
5. Self-contained refrigeration system, standard
6. 110-120v/60/1ph, 16.0 amps, standard
7. 6 ft straight blade power cord with NEMA 5-20P (self-contained), standard
8. NOTE: Compressor air intake from rear & out front panel, front panel cannot be blocked (Not applicable with remote refrigeration option)
9. Base Support: Units are supplied with levelers extended 1-1/4" & MUST be adjusted during installation to ensure unit is level for operation
10. Exterior: Wilsonart® or Formica® PREMIUM laminates (as noted in laminate chart on SCC website in Resources library)
11. Rear Exterior: Black, painted
12. Trim: Black standard
13. Upper Rear: Solid back panel, standard
14. Night cover, retractable, non-locking
15. Digital fahrenheit thermometer, standard

ITEM #98 MILK COOLER

1. By Owner's Vendor - NIKEC

ITEM #99 WIRE SHELVING

Quantity: Two (2)
Prime Spec: Metro
Alternates: Eagle
Model: A2424NC

1. Eight (8) Model A2424NC Super Adjustable Super Erecta® Shelf, wire, 24"W x 24"D, chrome plated finish, corner release system, NSF
2. Eight (8) Model 54UP Super Erecta® Post, 53-13/16"H, for use with stem casters, chrome plated finish
3. Four (4) Model 5MP Super Erecta® Stem Caster, swivel, 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper
4. Four (4) Model 5MPB Super Erecta® Stem Caster, swivel (with foot operated brake), 5" dia., 1-1/4" face, 300 lb. capacity, polyurethane flat wheel tread, includes bumper

ITEM #100 CASHIER STATION

Quantity: Two (2)
Prime Spec: Eagle Group
Alternates: Eagle
Model: SPECFAB

1. Model SPECFAB Cashier Station, open cabinet base, 30"W x 30"D, 14/3 stainless steel top, square turndown edges, (1) top grommets (1) 30"W x 12"D solid ribbed tray slide w/ drop-down brackets, (1) cash drawer w/ lock, Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel bottom shelf, stainless steel toe kicks, NSF. (1) GFI Duplex Receptacle for Cash Register. Receptacle Pre-Wired To Junction Box(s) for Final Connections in the Field by Others.

ITEM #101 CASHIER STATION

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Eagle
Model: SPECFAB

1. Model SPECFAB Cashier Station, open cabinet base, 78"W x 30"D, 14/3 stainless steel top, square turndown edges, (2) top grommets, (2) cash drawer(s) w/ lock(s), Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel bottom shelf, stainless steel toe kicks, NSF. (2) GFI Duplex Receptacles for Cash Registers. Receptacles Pre-Wired To Junction Box(s) for Final Connections in the Field by Others.

ITEM #102 POS

1. By Owner's Vendor - NIKEC

ITEM #103 SPARE NO.

ITEM #104 SPARE NO.

ITEM #105 CONDIMENT COUNTER

Quantity: Two (2)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with hinged doors, 6'W x 30"D, 14/304 stainless steel top, 6"H backsplash, square turndown edges, Uni-Lok® gusset system, Premium laminated stainless steel cabinet body w/ hinged doors (Laminated Front & Ends), stainless steel intermediate shelf, stainless steel bottom shelf, stainless steel toe kicks, NSF.
2. Four (4) Server Products Model 07210 SE-4DI SERVER EXPRESS™, quadruple, drop-in, (4) Express™ pumps dispense ambient condiments & dressings from (4) 1-1/2 gallon pouches with a 16 mm fitment, a full portion yields 1 oz., which can be reduced in 1/4 oz. increments, stainless steel base, ADA Compliant, BPA free, NSF

ITEM #106 TRASH COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with hinged doors, 5'W x 30"D, 14/304 stainless steel top, 6"H backsplash, square turndown edges, Uni-Lok® gusset system, (2) top cutouts w/ removable trash chutes, Premium laminated stainless steel cabinet body w/ hinged doors (Laminated Front & Ends), open base provisions for trash cans, stainless steel toe kicks where applicable, NSF.

ITEM #107 TRASH COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, cabinet base with hinged doors, 8-1/2'W x 30"D, 14/304 stainless steel top, 6"H backsplash, square turndown edges, mitered end, Uni-Lok® gusset system, (3) top cutouts w/ removable trash chutes, Premium laminated stainless steel cabinet body w/ hinged doors (Laminated Front & Ends), open base provisions for trash cans, stainless steel toe kicks where applicable, NSF.

ITEM #108 MICROWAVE COUNTER

Quantity: One (1)
Prime Spec: Eagle Group
Alternates: Advance Tabco, Elkay
Model: SPECFAB

1. Model SPECFAB Work Table, open cabinet base, 30"W x 30"D, 14/304 stainless steel top, 6"H backsplash, square turndown edges, Uni-Lok® gusset system, Premium laminated stainless steel cabinet body (Laminated Front & Ends), stainless steel intermediate shelf, stainless steel toe kicks, NSF.
2. ACP Model RMS10DSA Amana® Commercial Microwave Oven, 0.8 cu. ft. capacity, 1000 watts, low volume, single stage cooking, (1) power level, lighted control dial, 6-minute max cooking time, interlock safety switch, audible end of cycle signal, side hinged door with tempered glass, LED lighted interior, stainless steel interior & exterior, 120v/60/1-ph, 13.0 amps, 15 MCA, 1500 watts (total), cord, NEMA 5-15P, cETLus, ETL-Sanitation
3. ACP 3-year limited warranty (1 year full)

END OF SECTION 114000

SECTION 115213 - PROJECTION SCREENS

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. Electrically operated, front-projection screens and controls.

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for metal support framing for front-projection screens.
 - 2. Section 061053 "Miscellaneous Rough Carpentry" for wood backing for screen installation.

1.3 DEFINITIONS

- A. Gain: Ratio of light reflected from screen material to that reflected perpendicularly from a magnesium carbonate surface as determined per SMPTE RP 94.
- B. Half-Gain Angle: The angle, measured from the axis of the screen surface to the most central position on a perpendicular plane through the horizontal centerline of the screen where the gain is half of the peak gain.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show layouts and types of front-projection screens. Include the following:
 - 1. Drop lengths.
 - 2. Location of seams in viewing surfaces.
 - 3. Location of screen centerline relative to ends of screen case.
 - 4. Anchorage details, including connection to supporting structure for suspended units.
 - 5. Details of juncture of exposed surfaces with adjacent finishes.
 - 6. Location of wiring connections for electrically operated units.

7. Wiring diagrams for electrically operated units.
8. Accessories.

C. Samples for Initial Selection: For finishes of surface-mounted screen cases.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For front-projection screens to include in maintenance manuals.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Environmental Limitations: Do not deliver or install front-projection screens until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 COORDINATION

A. Coordinate layout and installation of front-projection screens with adjacent construction, including ceiling suspension systems, light fixtures, HVAC equipment, fire-suppression system, and partitions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Projection Screens: Obtain front-projection screens from single manufacturer. Obtain accessories, including necessary mounting hardware, from screen manufacturer.

2.2 ELECTRICALLY OPERATED, FRONT-PROJECTION SCREENS

A. General: Manufacturer's standard units consisting of case, screen, motor, controls, mounting accessories, and other components necessary for a complete installation. Provide units that are listed and labeled as an assembly by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. 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. Controls: Remote, key-operated, three-position control switch installed in recessed device box with flush cover plate matching other electrical device cover plates in room where switch is installed.

- a. Provide power supply for low-voltage systems if required.
 - b. Provide locking cover plates for switches.
 - c. Provide key-operated, power-supply switch.
3. Motor in Roller: Instant-reversing motor of size and capacity recommended by screen manufacturer; with permanently lubricated ball bearings, automatic thermal-overload protection, preset limit switches to automatically stop screen in up and down positions, and positive-stop action to prevent coasting. Mount motor inside roller with vibration isolators to reduce noise transmission.
 4. Motor Electrical Characteristics:
 - a. Voltage: 120 V.
 - b. Horsepower: 1 hp.
 - c. Phase: Single.
 5. Screen Mounting: Top edge securely anchored to rigid metal roller and bottom edge formed into a pocket holding a 3/8-inch- (9.5-mm-) diameter metal rod with ends of rod protected by plastic caps.
 - a. Roller for motor in roller is supported by vibration- and noise-absorbing supports.
 6. Tab Tensioning: Provide units that have a durable low-stretch cord, such as braided polyester, on each side of screen that is connected to edge of screen by tabs to pull screen flat horizontally.
- B. Suspended, Electrically Operated Screens with Automatic Ceiling Closure, with Motor-in Roller, and with Tab Tensioning: Units designed and fabricated for suspended mounting; with bottom of case composed of two panels, fully enclosing screen, motor, and wiring; one panel hinged and designed to open and close automatically when screen is lowered and fully raised, the other removable or openable for access to interior of case.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Da-Lite Screen Company; Tensioned Advantage Deluxe Electrol.
 - b. Draper Inc; Signature/Series V.
 - c. Stewart Filmscreen Corporation; ABT Trap Door ElectriScreen.
 2. Provide metal or metal-lined wiring compartment.
 3. Screen Case: Made from metal, wood, wood products, and fire-retardant materials.
 4. Provide screen case constructed to be installed with ceiling finish applied to underside.
 5. Finish on Exposed Surfaces: Prime painted.

2.3 FRONT-PROJECTION SCREEN MATERIAL

- A. Matte-White Viewing Surface: Peak gain of not less than 0.9, and gain of not less than 0.8 at an angle of 50 degrees from the axis of the screen surface.
1. Products: Subject to compliance with requirements, provide one of the following:

- a. BEI Audio-Visual Products; Matte White.
 - b. Bretford, Inc; Matte White.
 - c. Da-Lite Screen Company; Matte White.
 - d. Draper Inc; Flexible Matte White.
 - e. Stewart Filmscreen Corporation; Snomatte 100.
- B. Material: Vinyl-coated, glass-fiber fabric or vinyl sheet.
- C. Mildew-Resistance Rating: Zero or 1 when tested according to ASTM G 21.
- D. Flame Resistance: Passes NFPA 701.
- E. Flame-Spread Index: Not greater than 75 when tested according to ASTM E 84.
- F. Seams: Where length of screen indicated exceeds maximum length produced without seams in material specified, provide screen with horizontal seam placed as follows:
1. At top of screen at juncture between extra drop length and viewing surface.
 2. In location indicated.
- G. Seamless Construction: Provide screens, in sizes indicated, without seams.
- H. Edge Treatment: Black masking borders.
- I. Quantities and Sizes of Viewing Surfaces:
1. Gym: Two (2) each, nominal 144 by 252 inches, 60 inches above floor to bottom.
 2. Media Center: Two (2) each, nominal 68 by 120 inches, 40 inches above floor to bottom.
- J. Provide extra drop length of dimensions and at locations indicated.
1. Color: Black.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install front-projection screens at locations indicated to comply with screen manufacturer's written instructions.
- B. Install front-projection screens with screen cases in position and in relation to adjoining construction indicated. Securely anchor to supporting substrate in a manner that produces a smoothly operating screen with vertical edges plumb and viewing surface flat when screen is lowered.
 1. Install low-voltage controls according to NFPA 70 and complying with manufacturer's written instructions.

- a. Wiring Method: Install wiring in raceway except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use UL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
2. Test electrically operated units to verify that screen controls, limit switches, closures, and other operating components are in optimum functioning condition.
3. Test manually operated units to verify that screen-operating components are in optimum functioning condition.

END OF SECTION 115213

SECTION 115313 - LABORATORY FUME HOODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Counter-mounted laboratory fume hoods.
2. Piping and wiring within fume hoods for service fittings, light fixtures, fan switches, and other electrical devices included with fume hoods.
3. Laboratory sinks and cup sinks in fume hoods.
4. Water, laboratory gas, and electrical service fittings in fume hoods.

B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring fume hoods.
2. Section 096513 "Resilient Base and Accessories" for resilient base applied to fume hood base cabinets.
3. Section 123553 "Laboratory Casework" for base cabinets and other requirements which govern this Section.

1.2 COORDINATION

- A. Coordinate layout and installation of framing and reinforcements for lateral support of fume hoods.
- B. Coordinate installation of fume hoods with laboratory casework and other laboratory equipment.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For laboratory fume hoods.

1. Include plans, elevations, sections, and attachment details.
2. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports.
3. Indicate locations and types of service fittings together with associated service supply connection required.
4. Indicate duct connections, electrical connections, and locations of access panels.
5. Include roughing-in information for mechanical, plumbing, and electrical connections.

6. Show adjacent walls, doors, windows, other building components, laboratory casework, and other laboratory equipment. Indicate clearances from the above items.
 7. Include layout of fume hoods in relation to lighting fixtures and air-conditioning registers and grilles.
 8. Include coordinated dimensions for laboratory equipment specified in other Sections.
- C. Product Test Reports: Showing compliance with specified performance requirements for as-manufactured containment and static pressure loss, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Source quality-control reports.
- E. Field quality-control reports.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish complete touchup kit for each type and color of fume hood finish provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged fume hood finish.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install fume hoods until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Locate concealed framing, blocking, and reinforcements that support fume hoods by field measurements before being enclosed, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS/PRODUCTS

- A. Bypass Fume Hoods with Steel Exterior:
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Hamilton; 60-inch wide, Safeaire II, or comparable product by one of the following:

- a. Air Master Systems Corporation.
- b. Fisher Hamilton, LLC.
- c. Labconco Corporation.
- d. NuAire Corporation.

- B. Source Limitations: Obtain laboratory fume hoods from single manufacturer.
- C. Product Designations: Drawings indicate sizes, types, and configurations of fume hoods by referencing designated manufacturer's catalog numbers. Other manufacturers' fume hoods of similar sizes, types, and configurations, and complying with the Specifications, may be considered. See Section 016000 "Product Requirements."

2.2 PERFORMANCE REQUIREMENTS

- A. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110:
1. As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm).
 2. Average Face Velocity: 100 fpm plus or minus 10 percent with sashes fully open.
 3. Face-Velocity Variation: Not more than 15 percent of average face velocity across the face opening with sashes fully open.
 4. Sash Position: Fully open.
 - a. Test hoods with horizontal sashes with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.
 - b. Test hoods with combination sashes fully raised, with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.
 5. Release Rate: 4.0 L/min.
- B. Static-Pressure Loss: Not more than 1/2-inch wg at 100-fpm face velocity with sash fully open when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.
- C. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design fume hoods for seismic performance.

2.3 FUME HOODS

- A. Product Standards: Comply with SEFA 1, "Laboratory Fume Hoods - Recommended Practices." Provide fume hoods UL listed and labeled for compliance with UL 1805.
- B. Bypass Fume Hoods: Provide bypass fume hoods. Compensating bypass above the sash opens as sash is closed. Provide sufficient bypass capacity so that face velocity with sash opening of 6 inches does not exceed 3 times the face velocity with sash fully open.

2.4 MATERIALS

- A. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.
- B. Glass: Clear, laminated tempered glass complying with ASTM C 1172, Kind LT, Condition A, Type I, Class I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.
 - 1. Ultraclear Glass: Glass plies each have visible light transmission not less than 91 percent.
 - 2. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201 for Category II materials.
 - 3. Permanently mark safety glass with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. 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.
- D. Fasteners: Provide stainless-steel fasteners where exposed to fumes.

2.5 FABRICATION

- A. General: Assemble fume hoods in factory to greatest extent possible. Disassemble fume hoods only as necessary for shipping and handling limitations. Fume hoods shall be capable of being partly disassembled as necessary to permit movement through a 35-by-79-inch door opening.
- B. Steel Exterior: Fabricate from steel sheet, 0.048 inch thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings. Apply chemical-resistant finish to interior and exterior surfaces of component parts before assembly.
- C. Ends: Fabricate with double-wall end panels without projecting corner posts or other obstructions to interfere with smooth, even airflow. Close area between double walls at front of fume hood and as needed to house sash counterbalance weights, utility lines, and remote-control valves.
- D. Splay top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.
- E. Interior Lining: Provide the following unless otherwise indicated:
 - 1. Epoxy, not less than 1/4 inch thick.
- F. Lining Assembly: Unless otherwise indicated, assemble with stainless-steel fasteners or epoxy adhesive, concealed where possible. Seal joints by filling with chemical-resistant sealant during assembly.

1. Fasten lining components together with stainless-steel cleats or angles to form a rigid assembly to which exterior panels are attached.
 2. Fasten lining components to a rigid frame assembly fabricated from stainless steel and to which exterior panels are attached.
 3. Punch fume hood lining side panels to receive service fittings and remote controls. Provide removable plug buttons for holes not used for indicated fittings.
- G. Rear Baffle: Unless otherwise indicated, provide baffle, of same material as fume hood lining, at rear of hood with openings at top and bottom. Secure baffle to cleats at rear of hood with stainless-steel screws. Fabricate baffle for easy removal for cleaning behind baffle.
1. Provide adjustable baffles with control adjustment strips at top and bottom with plastic or stainless-steel knobs.
 2. Provide adjustable baffles with remote-control adjustment from outside front of fume hood.
 3. Provide epoxy-coated, stainless-steel screen at bottom baffle opening to prevent paper from being drawn into the exhaust plenum behind baffles.
- H. Exhaust Plenum: Full width of fume hood and with adequate volume to provide uniform airflow from hood, of same material as hood lining, and with duct stub for exhaust connection.
1. Duct-Stub Material: stainless steel.
- I. Bypass Grilles: Provide grilles at bypass openings of fume hoods.
- J. Sashes: Provide operable sashes of type indicated.
1. Fabricate from 0.048-inch- thick steel sheet, with chemical-resistant finish. Form into four-sided frame with bottom corners welded and finished smooth. Make top member removable for glazing replacement. Set glazing in chemical-resistant, U-shaped gaskets.
 2. Glaze with laminated safety glass.
 3. Counterbalance vertical-sliding sash with sash weight and stainless-steel cable system to hold sash in place regardless of position. Provide ball-bearing sheaves, plastic glides in stainless-steel guides, and stainless-steel lift handles. Provide rubber bumpers at top and bottom of each sash unit.
- K. Airfoil: Unless otherwise indicated, provide airfoil at bottom of fume hood face opening with 1-inch space between airfoil and work top. Sash closes on top of airfoil, leaving 1-inch opening for air intake. Airfoil directs airflow across work top to remove heavier-than-air gases and to prevent reverse airflow.
1. Fabricate airfoil from stainless steel coated with polytetrafluoroethylene or polyvinylidene fluoride.
- L. Light Fixtures: Provide vaporproof, two-tube, rapid-start, fluorescent light fixtures, of longest practicable length; complete with tubes at each fume hood. Shield tubes from hood interior with 1/4-inch-thick laminated glass or 3-mm-thick tempered glass, sealed into hood with chemical-resistant rubber gaskets. Provide units with fluorescent tubes easily replaceable from outside of fume hood.

1. Provide fluorescent tubes with color temperature of 3500 K and minimum color-rendering index of 85.
- M. Filler Strips: Provide as needed to close spaces between fume hoods and adjacent building construction. Fabricate from same material and with same finish as fume hoods.
- N. Ceiling Extensions: Provide filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling.
- O. Comply with requirements in other Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring. Install according to Shop Drawings. Securely anchor fittings, piping, and conduit to fume hoods unless otherwise indicated.

2.6 FUME HOOD, SINKS AND SERVICE FITTINGS

- A. Comply with Section 123553 "Laboratory Casework."

2.7 CHEMICAL-RESISTANT FINISH

- A. General: Prepare, treat, and finish welded assemblies after welding. Prepare, treat, and finish components that are to be assembled with mechanical fasteners before assembling. Prepare, treat, and finish concealed surfaces same as exposed surfaces.
- B. Preparation: Clean steel surfaces, other than stainless steel, of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
- C. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply fume hood manufacturer's standard two-coat, chemical-resistant, 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.
 1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8M. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.
 2. Colors for Fume Hood Finish: As selected by Architect from manufacturer's full range.

2.8 ACCESSORIES

- A. Airflow Indicator and Alarm: Provide each fume hood with manufacturer's standard airflow indicator with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

- B. Sash Alarm: Provide fume hoods with audible and visual alarm that activates when sash is opened beyond preset position.
 - 1. Provide with silence and test switches.
- C. Sash Stops: Provide fume hoods with sash stops to limit hood opening to 50 percent of sash height. Sash stops can be manually released to open sash fully for cleaning fume hood and for placing large apparatus within fume hood.
- D. Bypass Grille Blank-off Panel: Provide fume hoods with blank-off panel on bypass grille designed for use with sash stops to reduce exhaust air volume and provide design face velocity with sash at 50 percent open position.

2.9 SOURCE QUALITY CONTROL

- A. Demonstrate fume hood performance before shipment by testing fume hoods according to ASHRAE 110. Provide testing facility, instruments, equipment, and materials needed for tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fume hoods.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fume hoods according to manufacturer's written instructions. Install level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework. Securely attach access panels but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Comply with requirements for installing water and laboratory gas service fittings and electrical devices.
 - 1. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink and work top-mounted fittings in sealant recommended by manufacturer of sink or work-top material. Securely anchor fittings to fume hoods unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

- A. Field test installed fume hoods according to "Flow Visualization and Velocity Procedure" requirements in ASHRAE 110.
 - 1. Test one installed fume hood, selected by Architect, for each type of hood installed, according to ASHRAE 110. If tested hood fails to meet performance requirements, field test additional hoods as directed by Architect.
- B. Field test installed fume hoods according to ASHRAE 110 to verify compliance with performance requirements.
 - 1. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.
 - 2. After making corrections, retest fume hoods that failed to perform as specified.

3.4 ADJUSTING AND CLEANING

- A. Adjust moving parts for smooth, near silent, accurate sash operation with one hand. Adjust sashes for uniform contact of rubber bumpers. Verify that counterbalances operate without interference.
- B. Clean finished surfaces, including both sides of glass; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 115313

SECTION 116143 - STAGE CURTAINS

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. Stage curtains and tracks.

- B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for steel framing and supports for stage-curtain systems.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product and the following:

- 1. Tracks: Capability of each track to support the weight and operation of curtains that it supports.

- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

- 1. Include plans, elevations, sections, and attachment details of curtains.
- 2. Include fabric assembly and hanging details.
- 3. Dimension operating clearances.

- C. Samples for Initial Selection: For each type of stage curtain indicated. Include color charts showing full range of colors, textures, and patterns available, together with 12-inch- (300-mm-) square Sample (any color) of each fabric type and seam.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Structural members to which tracks, battens, and other stage-curtain equipment will be attached.
2. Locations of lighting fixtures and cabling, ductwork, piping, and sprinklers.

B. Qualification Data: For Installer.

C. Product Certificates: For the following, from manufacturer:

1. Fabric: Provide name of flame-retardant chemical used, identification of applicator, treatment method, application date, allowable life span for treatment, and details of any restrictions and limitations.

D. Sample Warranty: For manufacturer's special warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer of stage curtains.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not install stage curtains until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Verify locations of supporting structural elements and construction contiguous with stage curtains and rigging by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of stage-curtain systems that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, faulty operation of rigging.
 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. A to Z Theatrical Supply and Service; Kansas City, MO (816) 523-1655.

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2. Beck Studios Inc, Milford, OH (800)426-6790
3. H&H Specialities; El Monte, CA.
4. J.R. Clancy, Inc.; Syracuse, NY.
5. Peter Albrecht Corp.; Greendale, WI (414) 421-6630.
6. SECOA, Inc.; Minneapolis, MN (763) 506-8800.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Stage-curtain systems and attachments to structure shall withstand the effects of gravity and operational loads and the following loads and stresses:
 1. Design Loads: Weight of curtains.
- B. Fire-Test-Response Characteristics: Provide stage curtains meeting the following requirements as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Flame-Propagation Resistance: Passes NFPA 701.
 - a. Permanently attach label to each fabric of curtain assembly indicating whether fabric is inherently and permanently flame resistant or is treated with flame-retardant chemicals and whether it requires retreatment after cleaning or after a designated time period of use.
 - b. Permanently attach 12-inch- (300 mm-) square swatch of same fabric and dye lot for each fabric of a curtain assembly to the back of assembly for use as fire-resistance test strip.

2.3 CURTAIN FABRICS

- A. General: Provide fabrics inherently and permanently flame resistant or chemically flame resistant by immersion treatment according to performance requirements indicated. Provide fabrics of each type and color from same dye lot.
- B. Heavyweight Woven Cotton Velour: Napped fabric of 100 percent cotton weighing not less than 25 oz./linear yd. (775 g/linear m), with pile height not less than 79 mils (2 mm); 54-inch (1372-mm) minimum width.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dazian LLC; Symphony.
 - b. Frankel Associates/Fabric One; 950.
 - c. JB Martin Company; #2703 Overture.
 - d. KM Fabrics, Inc.; Memorable.
 - e. Valley Forge Fabrics, Inc.; 2525 Velour.
 2. Color/Texture/Pattern: TBD.

3. Drapery installed on endless line rigging in 100% fullness in addition to finished dimension.
- C. Fabrication of all curtains shall be of single piece panels for the entire height of the curtain. All thread shall be cotton mercerized, and shall be the color of the fabric on which it is used, both in the needle and in the bobbin. No thread lighter than #16 shall be used.
 1. Height of Curtains:
 - a. Stage: _'-_'' tall.
- D. Puckered seams and bad stitching shall not be acceptable all seams are to be straight and even lines.

2.4 CURTAIN FABRICATION

- A. General: Affix permanent label, stating compliance with requirements of authorities having jurisdiction, in accessible location on fabric not visible to audience. Provide vertical seams unless otherwise indicated. Arrange vertical seams so they do not fall on faces of pleats. Do not use fabric cuts less than one-half width. Orient velour fabric with the fabric nap down.
- B. Vertical and Top Hems: Machine sew hems as follows unless otherwise indicated:
 1. Vertical Hems: Minimum 2 inches (50 mm) wide, with not less than a 1-inch (25-mm) tuck and with no selvage material visible from front of curtain. Sew open ends of hems closed.
 2. Top Hems: Reinforced by double-stitching 3-1/2-inch- (89-mm-) wide, heavy, jute or laminated synthetic webbing to top edge on back side of curtain with not less than 2 inches (50 mm) of face fabric turned under.
- C. Fullness:
 1. 100 Percent Fullness: Provide fullness, exclusive of turnbacks and hems, by sewing additional material into 6-inch (150-mm) double-stitched, flat, box pleats spaced at 12 inches (300 mm) o.c. along top hem reinforcement.
- D. Bottom Hems: Machine sew hems as follows unless otherwise indicated:
 1. For Curtains with Fullness:
 - a. Floor-Length Curtains: Hems not less than 6 inches (150 mm) deep, with 1-inch (25-mm) weight tape sewn to top seam of the bottom hem, clear of the finished bottom edge, and with open ends of hems sewn closed.
- E. Grommets: Brass, No. 3, or No. 4.
 1. Black Curtains: Provide brass or aluminum grommets with black finish.

2.5 CURTAIN ACCESSORIES

- A. S-Hooks: Manufacturer's standard heavy-duty plated-wire hooks, not less than 2 inches (50 mm) long.

2.6 STEEL CURTAIN TRACK

- A. Steel Track: Roll-formed, galvanized, commercial-quality, zinc-coated steel sheet, ASTM A 653/A 653M; G60 (Z180) coating designation; with continuous bottom slot and with each half of track in one continuous piece; black paint finish; complete with necessary accessories for support and operation.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Automatic Devices Company; 280 series, Silent Steel.
 - b. H & H Specialties Inc.; 400 series.
 - c. Tru-Roll, Inc., a division of Advanced Entertainment Technology; No. 1000 Heavy Duty Straight Track.
 - 2. Steel Thickness: As recommended by manufacturer for loads and operation.
 - a. Heavy Duty: Minimum 0.079 inch (2.01 mm).
- B. Clamp and Bracket Hangers: Steel clamps and brackets of sufficient strength required to support loads for attaching track to overhead support.
- C. Track-Lap Clamp: Metal to match track channel for attaching two tracks at center overlap.
- D. Heavy-Duty Track System: Equip track with heavy-duty components as recommended by manufacturer for loads and operation. Provide end stops for track.
 - 1. Curtain Carriers: Standard carriers of plated steel with a pair of nylon-tired ball-bearing wheels riveted parallel to body. Equip carriers with rubber or neoprene bumpers to reduce noise, and heavy-duty, plated-steel swivel eye and trim chain for attaching curtain snap or S-hook. Provide quantity of curtain carriers sufficient for track length, to suit curtain fabrication.
 - a. Master Curtain Carriers: One master carrier, for each leading curtain edge, of plated steel with two pairs of nylon-tired ball-bearing wheels and with two line guides per carrier.
 - 2. Pulleys: One dead-end, single-wheel pulley; one live-end, double-wheel pulley; and one adjustable pulley to maintain proper tension on operating line; each with not less than 5-inch (125-mm) molded-nylon- or glass-filled-nylon-tired ball-bearing sheaves enclosed in steel housings. Provide pulleys with steel housing finished to match track and with bracket for securing off-stage curtain end.

2.7 DRAPERY SCHEDULE - TBD

2.8 STAGE RIGGING LAYOUT

- A. Distance from Proscenium:
1. Front Curtain:
 2. Rear Curtain:
 3. Side Arms: Stage Right:

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for supporting members, blocking, installation tolerances, clearances, and other conditions affecting performance of stage-curtain work.
- B. Examine inserts, clips, blocking, or other supports required to be installed by others to support tracks and battens.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install stage-curtain system according to curtain and track manufacturer's written instructions.

3.3 TRACK INSTALLATION

- A. Ceiling-Mounted Track: Drill track at intervals not greater than manufacturer's written instructions for spacing, and fasten directly to structure.
- B. Track-Support Spacing: According to manufacturer's recommendations for applied loads, but not exceeding the following dimensions between supports:
1. Heavy-Duty Track: 72 inches (1829 mm).
- C. Install track for center-parting curtains with not less than 24-inch (600-mm) overlap of track sections at center, supported by track lap clamps.

3.4 CURTAIN INSTALLATION

- A. Track Hung: Secure curtains to track carriers with S-hooks.

LEE'S SUMMIT MIDDLE SCHOOL #4
PACKAGE 3 – BUILDING
LEE'S SUMMIT, MISSOURI

13-20102-00
22 SEPTEMBER 2020
100% REVIEW SET

END OF SECTION 116143

STAGE CURTAINS

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SECTION 116623 - GYMNASIUM EQUIPMENT

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. This Section includes the following gymnasium equipment:
 - 1. Basketball equipment.
 - 2. Volleyball equipment.
 - 3. Roll-up divider system.
 - 4. Exercise equipment.
 - 5. Safety pads.
 - 6. Gym control center.
 - 7. Scoreboards.
- B. Related Sections include the following:
 - 1. Section 033000 "Cast-in-Place Concrete" for installation of floor insert sleeves to be cast in concrete slabs and footings.
 - 2. Division 26 Sections for electrical service for motor operators, controls, and other powered devices for motorized gymnasium equipment.

1.3 DEFINITIONS

- A. NFHS: The National Federation of State High School Associations.
- B. USAV: USA Volleyball.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. If applicable, include assembly, disassembly, and storage instructions for removable equipment.
 - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.

- B. Shop Drawings: For gymnasium equipment. Include plans, elevations, sections, details, attachments to other work, and the following:
 - 1. Method of field assembly for removable equipment, connections, installation details, mountings, floor inserts, attachments to other work, and operational clearances.
 - 2. Transport and storage accessories for removable equipment.
- C. Structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation including loads, point reactions, and locations for attachment of gymnasium equipment to structure.
- D. Samples for Initial Selection: For each type of gymnasium equipment indicated.
- E. Product Certificates: For each type of gymnasium equipment, signed by product manufacturer.
- F. Qualification Data: For Installer and professional engineer.
- G. Operation and Maintenance Data: For gymnasium equipment to include in emergency, operation, and maintenance manuals.
- H. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment.

1.7 COORDINATION

- A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Basketball backboard failures including glass breakage.
 - b. Faulty operation of winches and motors.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - 1. Extruded Bars, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 - 2. Cast Aluminum: ASTM B 179.
 - 3. Flat Sheet: ASTM B 209 (ASTM B 209M).
- B. Steel: Comply with the following:
 - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 2. Steel Tubing: ASTM A 500 or ASTM A 513, cold formed.
 - 3. Steel Sheet: ASTM A 1011/A 1011M.
- C. Support Cable: Manufacturer's standard galvanized steel aircraft cable with a breaking strength of 7000 lb (3175 kg). Provide fittings complying with cable manufacturer's written instructions for size, number, and method of installation.
- D. Support Chain and Fittings: Grade 80 hardened alloy steel chain rated for overhead lifting, ASTM A 391/A 391M, with commercial-quality, hot-dip galvanized steel connectors and hangars.
- E. Castings and Hangers: Malleable iron, ASTM A 47/A 47M, grade required for structural loading.
- F. Softwood Plywood: DOC PS 1, exterior.
- G. Particleboard: ANSI A208.1.

- H. Equipment Wall-Mounting Board: Wood, transparent or neutral-color painted finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written instructions.
- I. Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed.
- J. Grout: Nonshrink, nonmetallic, premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 with minimum strength recommended in writing by gymnasium equipment manufacturer.

2.2 BASKETBALL EQUIPMENT

- A. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated on the Drawings, or comparable products by one of the following:
 - 1. AALCO Manufacturing.
 - 2. Arizona Courtlines, Inc.
 - 3. ADP Lemco Inc.
 - 4. Basketball Products International; a division of American Athletic, Inc.
 - 5. Bison Inc.
 - 6. Douglas Industries, Inc.
 - 7. Draper Inc.
 - 8. Institutional Products Inc.
 - 9. Jaypro Sports, LLC.
 - 10. L.A. Steelcraft.
 - 11. Performance Sports Systems.
 - 12. Porter Athletic Equipment Company.
 - 13. P.W. Athletic Mfg. Co.
- B. General: Provide equipment complying with requirements in NFHS's "NFHS Basketball Rule Book."
- C. Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.
- D. Overhead-Supported Backboard:
 - 1. Folding Type: Provide manufacturer's standard assembly for forward-folding, rear-braced backboard, with hardware and fittings to permit folding.
 - 2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
 - a. Center-Mast Frame: Welded with side sway bracing.
 - b. Finish: Manufacturer's standard powder-coat finish, white.
- E. Backstop Safety Device: Designed to limit free fall if support cable, chains, pulleys, fittings, winch, or related components fail; with mechanical automatic reset; 6000-lb (2700-kg) load capacity; one per folding backstops over bleachers.

1. Retractor Device: Manufacturer's standard device designed to retract both support and safety cables, chains, and straps away from play of the basketball when backstop is in playing position; one per folding backstops over bleachers.
- F. Winch: For wall-mounted backboards provide hoist, consisting of heavy-duty, fully enclosed worm-gear, brake, cable drum, cable, and fittings, for mounting on wall with equipment mounting board; designed to move and hold backboard in any raised or lowered position.
1. Operation: Manual winch with detachable hand crank.
- G. Backboard Electric Operator: For overhead-supported backboards, provide operating machine of size and capacity recommended by manufacturer for equipment specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, and remote controls. Coordinate wiring requirements and electrical characteristics with building electrical system.
1. Operator Type: Cable drum with grooved drum and cable tension device to automatically take up cable slack and retain cable in grooves.
 2. Operator Mounting: Manufacturer's standard.
 3. Motor Characteristics: Sufficient to start, accelerate, reverse, and operate connected loads at designated speeds within installed environment and with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1, and the following:
 4. Voltage: 120 V.
 5. Horsepower: 3/4 hp.
 6. Enclosure: Manufacturer's standard.
 7. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.
 8. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
 9. Phase: One.
 10. Remote-Control Station(s): Provide in Gym Control Center.
 11. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop basketball equipment at fully retracted and fully lowered positions.
- H. Basketball Backboard:
1. Shape and Size:
 - a. Rectangular, 72 by 42 inches (1800 by 1050 mm) width by height.
 2. Backboard Material: With predrilled holes or preset inserts for mounting goals, and as follows:
 - a. Glass: Not less than 1/2-inch- (13-mm-) thick, transparent tempered glass. Provide glass with impact-absorbing resilient rubber or PVC gasket around perimeter in a fully welded, painted steel frame, with steel subframe, reinforcement, and bracing, including center-strut frame reinforcement, and with mounting slots for mounting backboard frame to backboard support framing.

- 1) Standard Mount: Provide steel corner reinforcement with mounting slots for mounting backboard frame to backboard support framing at standard mounting centers.
 - 2) Rim-Restraining Device: Complying with NCAA and NFHS rules and designed to ensure that basket remains attached if glass backboard breaks.
3. Target Area and Border Markings: Permanently etched in white color, marked in pattern and stripe width according to referenced rules.
- I. Goal Mounting Assembly: Compatible with goal, backboard, and support framing; with hole pattern that is manufacturer's standard for goal attachment.
1. Glass Backboard Goal Mounting Assembly: Goal support framing and reinforcement designed to transmit load from goal to backboard frame and to minimize stresses on glass backboard.
 2. Direct Mount: Designed for mounting goal directly and independently to center strut height adjuster of backboard support framing so no force, transmitted by ring, is directly applied to backboard and rigidity and stability of goal are maximized.
- J. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.
1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication complying with referenced rules.
 2. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism including positive-lock, preset pressure release, set to release at 180- and 230-lb (82- and 105-kg) load, and automatic reset. Provide movable ring with rebound characteristics identical to those of fixed, nonmovable ring.
 3. Net Attachment: No-tie loops for attaching net to rim without tying.
 4. Finish: Powder-coat finish.
- K. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches (400 to 450 mm) long, sized to fit rim diameter, and as follows:
1. Competition Cord: Antiwhip, made from white nylon cord not less than 120- or more than 144-gm thread.
- L. Backboard Safety Pads: Designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports as required by referenced rules.
1. Attachment: Adhesive.
 2. Color: To be selected by Architect from manufacturer's full range.

2.3 VOLLEYBALL EQUIPMENT

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

GYMNASIUM EQUIPMENT

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1. AALCO Manufacturing.
 2. ADP Lemco Inc.
 3. American Athletic, Inc.
 4. Arizona Courtlines, Inc.
 5. Bison Inc.
 6. Douglas Industries, Inc.
 7. Draper Inc.
 8. Jaypro Sports, LLC.
 9. L. A. Steelcraft.
 10. Performance Sports Systems.
 11. Porter Athletic Equipment Company.
 12. P. W. Athletic Mfg. Co.
 13. Schelde North America.
 14. Sports Imports.
- B. General: Provide equipment complying with requirements in NFHS's "NFHS Volleyball Rule Book."
- C. Floor Insert: Solid-brass floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, sized with ID to fit post standards, not less than length required to securely anchor pipe sleeve below finished floor in concrete footing; with anchors designed for securing floor insert to floor substrate indicated; one per post standard.
1. Floor Plate: Lockable swivel access cover, designed for use with floating wood floors and to be flush with adjacent flooring. Provide two tool(s) for unlocking access covers.
- D. Post Standards: Removable, paired volleyball post standards as indicated. Adjustable, telescoping height. Designed for easy removal from permanently placed floor insert supports. Fabricated from extruded-aluminum pipe or tubing, with nonmarking plastic or rubber end cap or floor bumper to protect permanent flooring. Finished with manufacturer's standard factory-applied, clear anodized or baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness or plated metal finish.
1. Nominal Pipe or Tubing Diameter: 3-1/2-inch (89-mm) OD at base.
 2. Telescopic and Net Height Adjuster System: Provide manufacturer's standard telescoping system with locking device, telescopic post, and fittings for holding net at selected height; designed for height adjustment of post standard to position net at heights indicated.
 - a. Net Heights: Between 73 inches and 95-58 inches.
 3. Height Markers: Clearly marked at regulation play heights for elementary school girls and boys.
- E. Net: 32 feet (9.75 m) long and as follows; 1 per pair of paired post standards:
1. Width and Mesh: Competition volleyball net, 39 inches (990 mm) with 4-inch- (102-mm-) square mesh made of black nylon string.

- a. Hem Band Edges: White, not less than 2-inch- (50-mm-) wide top, bottom, and side bindings; not less than 1-inch- (25-mm-) wide tension straps at top, bottom and midpoint of each side end of net; end sleeves for dowels; and lines with linkage fittings threaded through top and bottom hems of binding. Provide lengths of lines and linkage fittings as required to properly connect to and set up net for post standard spacing indicated on Drawings.
 - 1) Top Line: Not less than 1/8-inch- (3-mm-) diameter, galvanized or coated steel cable.
 2. Dowels: Not less than 1/2-inch- (13-mm-) diameter fiberglass or 1-inch- (25-mm-) diameter wood. Provide two dowels per net threaded through each side hem sleeve for straightening net side edges.
 3. Net Antennas: 3/8-inch- (9.5-mm-) diameter, high-tensile-strength, extruded fiberglass or plastic rods, 72 inches (1800 mm) long, extending above top hem band of net, with alternating white and red bands according to competition rules. Provide two antennas per net.
 - a. Clamps: Designed to secure antenna to top and bottom of net.
 4. Boundary Tape Markers: 2-inch- (50-mm-) wide white strip, secured to net top and bottom with hook-and-loop attachment. Provide two tape markers per net for marking court boundaries.
- F. Net Tensioning System: Designed to adjust and hold tension of net. Fully enclosed, nonslip manufacturer's standard-type winch with cable length and fittings for connecting to net lines, positive-release mechanism, and removable handle. Mount net tensioner on post standard at side away from court. Provide end post with post top pulley. Provide opposing post with welded steel loops, hooks, pins, or other devices for net attachment and post top grooved line guide.
- G. Safety Pads: Comply with NFHS requirements. Provide pads consisting of not less than 1-1/2 inch thick, multiple-impact-resistant manufacturer's standard foam filler covered by puncture- and tear-resistant, manufacturer's standard fabric cover; with fire-test-response characteristics indicated. Provide pads with hook-and-loop closure or attachments for the following components:
1. Post Standards: Wraparound style, designed to totally enclose each standard to a height of not less than 66 inches (1680 mm); 1 per post.
 2. Net Lines: Four per net.
 3. Fabric Cover Flame-Resistance Ratings: Passes NFPA 701.
 4. Fabric Color: As selected by Architect from manufacturer's full range.
- H. Post Standard Transporter: Manufacturer's standard wheeled unit designed for transporting a single post.
- I. Wall Storage Rack: Manufacturer's standard unit designed for mounting on walls and for storing post standards in vertical position with retaining arms, fittings for padlock, and mounting hardware; number of units as required to provide storage for specified equipment.

2.4 ROLL-UP DIVIDER SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AALCO Manufacturing.
 2. ADP Lemco.
 3. Draper Inc.
 4. Jaypro Sports, LLC.
 5. Performance Sports Systems.
 6. Porter Athletic Equipment Company.
- B. Divider Curtain System: Electrically operated with roll-up drive pipe, and as follows:
1. Top Hem: Double-thickness mesh or solid vinyl for continuous pipe batten.
 2. Outer Edge Hems: Double turned and welded.
 3. Belts: Manufacturer's standard width polyester or polyurethane webbing or fabric belts, attached to top batten, passing under bottom batten, and terminating at drive pipe, with friction surface on one side of belt or other means of drawing up curtain by rolling at bottom batten.
 4. Support Chain and Fittings: Hardened alloy steel chain rated for lifting loads indicated, with commercial-quality, corrosion-resistant steel connectors and hangers.
 5. Curtain Battens and Drive Pipe: Fabricate from steel pipe or tubing with a minimum number of joints, as necessary for required lengths. Provide galvanized battens, or shop prime and shop finish with black paint.
 - a. Drive Pipe: 2-3/8-inch- (60-mm-) nominal diameter steel pipe.
 - b. Top Batten: 1-1/2-inch- (38-mm-) nominal diameter steel pipe.
 - c. Bottom Batten: 3-1/2-inch- (89-mm-) nominal diameter steel pipe.
- C. Upper Curtain, Mesh: Woven mesh of polyester yarn coated with vinyl, weighing not less than 13 oz./sq. yd. (440 g/sq. m).
1. Mesh Color: As selected by Architect from full range of industry colors and color densities.
- D. Lower Curtain, Solid: Woven polyester fabric coated with vinyl, 22 oz./sq. yd. (745 g/sq. m), 10-foot (3.0-m) height above floor.
1. Fabric Color: One color, as selected by Architect from full range of industry colors and color densities.
- E. Hems: Folded and electronically welded.
- F. Seams: Electronically welded.
- G. Overall Curtain Height: Floor to ceiling, within installation clearances required.
- H. Bottom of Curtain: Approximately 2 inches (50 mm) above finished floor.

- I. Divider Curtain Flame-Resistance Ratings: Passes NFPA 701, Test 2.

2.5 EXERCISE EQUIPMENT

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Arizona Courtlines, Inc
 2. Draper Inc.
 3. Jaypro Sports, LLC.
 4. Performance Sports Systems.
 5. Porter Athletic Equipment Company.
- B. Pull-up Bar and Flex Hang Bar: Wall mounted.
1. Fixed height.
 2. Adjustable Height: In 6-inch (152-mm) increments within a range of 30 inches (760 mm).
 3. Bar Length: Not less than 36 inches (910 mm).
 4. Bar: Not less than 1-1/16-inch- (27-mm-) diameter, round, plated solid-steel bar.
 5. Support Frame: Steel-angle end brackets attached to wood stringers, steel channels, or bars.
 6. Bar Installation Height and Wall Clearance: 66 inches (1676 mm) minimum above the floor and at not less than 12 inches (305 mm) from wall.
- C. Pegged Board Vertical Climber: Manufacturer's standard wall-mounted board; size as indicated; with two peg handholds per board.
1. Size: 15 inches by 60 inches (381mm by 1524mm).
- D. Climbing Rope: 1-1/2-inch- (38-mm-) diameter rope; with top end securely clamped in fitting designed for attaching to supporting structure indicated.
1. Description: Manufacturer's standard material.
 2. Length: Length as required to allow 42 inches (1067 mm) of rope to lie on floor.
 3. Rope Bottom End: Manufacturer's standard.
 4. Rubber Balls: Securely fastened every 12 inches (300 mm) along length of rope.
 5. Safety Guard: 3/16-inch (5-mm-) support chain or 1/8-inch- (3-mm-) diameter cable, clamp, and fittings designed for attaching guard to supporting structure indicated.
 6. Pipe Beam: Ceiling mounted; not less than 3-1/2-inch- (89-mm-) OD steel pipe or tubing beam with not less than 2-3/8-inch- (60-mm-) OD drop pipes, bracing, and connectors designed for transferring load and securely attaching to supporting structure indicated.
- E. Rope Hoist: Wall attached; consisting of #10 bell cord or 1/4-inch- (6-mm-) diameter, synthetic polyfiber rope, snap swivel fitting, rope adjuster, rope weight, weight bag, pulley, rope cleat, clear-finished wood wall equipment pads for pulley and cleat attachment, clamps, and fasteners.

2.6 SAFETY PADS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AALCO Manufacturing.
 2. ADP Lemco Inc.
 3. American Athletic, Inc.
 4. Arizona Courtlines, Inc
 5. Draper Inc.
 6. Institutional Products Inc.
 7. Jaypro Sports, LLC.
 8. Performance Sports Systems.
 9. Porter Athletic Equipment Company.
- B. Safety Pad Surface-Burning Characteristics: ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.
- C. Pad Coverings: Provide safety pad fabric covering fabricated from puncture- and tear-resistant, not less than 14-oz./sq. yd (475-g/sq. m) PVC-coated polyester or nylon-reinforced PVC fabric treated with fungicide for mildew resistance; with surface-burning characteristics indicated, and lined with fire-retardant liner.
- D. Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board.
1. Backer Board: Not less than 3/8-inch- (9.5-mm-) thick fire-retardant-treated plywood per AWWA C27, Interior Type A.
 2. Fire-Resistive Fill: Multiple-impact-resistant foam not less than 2-inch- (50-mm-) thick fire-resistive neoprene, 6.0-lb/cu. ft. (96-kg/cu. m) density.
 3. Size: Each panel section, 24 inches (600 mm) wide by not less than 72 inches (1800 mm) long.
 4. Number of Panel Sections: As indicated modular panel sections.
 5. Installation Method: Concealed mounting Z-clips 1-inch (25-mm) bottom fabric attachment flange with exposed fasteners.
 6. Fabric Covering Color(s): As selected by Architect from manufacturer's full range for two color(s).

2.7 GYM CONTROL CENTER

- A. Provide Porter Control Panel System 02550-000 or approved equal including, but not limited to, the following components for complete control of all motorized gymnasium equipment and scoreboards.

1. Control Panels: Control panels specifically manufactured to operate winches/motors associated with basketball backstops, divider curtains and volleyball nets as well as auxiliary gymnasium equipment such as scoreboards. Each control panel shall contain up to six momentary relays for “up-down” operation as well as two auxiliary relays for providing “on-off” continuous power to a load. Control panels shall be Porter Model No. 12550-200 or approved equal. Furnish one control panel for installation under Division 26 electrical.
2. Control Keypad: Semi-flush mounted heavy duty keypad specifically manufactured to operate in conjunction with the control panels noted above. Control keypad shall be Porter Model No. 12550-100 or approved equal. Furnish one control keypad for installation under Division 26 electrical.
3. Gymnasium Legend: Custom wall-mounted graphical representation of gymnasium indicating locations of items throughout the gymnasium with numerical indicator which relate to numbers on the control keypad. Provide one legend per keypad.

2.8 SCOREBOARDS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Daktronics; Model BB-2105 or comparable product by the following:
 1. Fairplay.
 2. Nevco.
 3. Translux.
- B. Characteristics:
 1. Size: Nominal 4 feet tall by 10 feet wide.
 2. Scoring for basketball, volleyball and wrestling.
 3. LED lighting.
 4. Horn.
 5. Time clock to be bi-directional with ability to directly set any number of minutes and seconds.
 6. Border striping.
 7. Wireless control operation.
 8. Wireless Control Consoles:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Daktronics All-Sport 5000 control consoles with carrying case or comparable products by one of the following:
 - 1) Fairplay.
 - 2) Nevco.
 - 3) Translux.
 - b. Quantity: One per scoreboard.
 - c. Provide one per scoreboard, 2.4 ghz radio transmitter capable of operating on different frequencies to allow for independent or combined use of the scoreboards.

- d. Provide 5-year warranty on parts coverage for scoreboards and wireless components.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.
 1. Verify critical dimensions.
 2. Examine supporting structure and subgrades, subfloors and footings below finished floor.
 3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked. Locate reinforcements and mark locations.
 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly, where required.
- B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.
- C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.
 1. Floor Insert Location: Coordinate location with application of game lines and markers, and core drill floor for inserts after game lines have been applied.
 2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and type of floor plate.
 3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.
- D. Floor Insert Setting: Position sleeve in oversized, recessed voids in concrete slabs and footings. Clean voids of debris. Fill void around sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions. Protect portion of sleeve above subfloor and footing from splatter. Verify that sleeves are set plumb, aligned, and at correct height and spacing; hold in position during placement and finishing operations until grout is sufficiently cured. Set insert so top surface of completed unit is flush with finished flooring surface.

- E. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.
- F. Connections: Connect automatic operators to building electrical system.
- G. Removable Gymnasium Equipment and Components: Assemble in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Disassemble removable gymnasium equipment after assembled configuration has been approved by Owner, and store units in location indicated on Drawings.

3.3 ADJUSTING

- A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING

- A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment.

END OF SECTION 116623

SECTION 116803 - ATHLETIC EQUIPMENT

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. This Section includes the following athletic equipment:

1. Track and field equipment.
2. Football and soccer goals.
3. Football scoreboard and play clocks.
4. Baseball/Softball scoreboard.
5. Batting tunnels.
6. Foul poles.
7. Ballfield equipment
8. Ballfield top rail padding for fences.
9. Dugout equipment

- B. Related Sections include the following:

1. Section 033000 "Cast-in-Place Concrete" for all poured in place concrete.
2. Section 322000 "Resilient Track Surfacing."
3. Division 26 electrical sections for scoreboards and power requirements for batting cages.
4. Section 323113 "Chain Link Fences and Gates" for ballfield top rail padding.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design and install all equipment to meet or exceed all applicable governing codes and criteria as noted on the structural drawings. Provide professionally sealed engineering drawings for footings and support systems for football goal posts, scoreboards, play clocks, and discus net support systems.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.

- B. Product Certificates: For each type of athletic equipment, signed by product manufacturer.
- C. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements. Include evidence of manufacturing experience.
- D. Qualification Data: For installer and professional engineer.
- E. Maintenance Data: For athletic equipment include applicable data in maintenance manuals.
- F. Delegated Design Submittals:
 - 1. For football goal, soccer goal, and discus cage concrete footings per manufacturer and complying with all specified structural loads and applicable codes.
 - 2. Provide engineered design details for scoreboard and play clocks, steel tube support posts, concrete footings and all connections as required for a complete outdoor scoreboard installation, including comprehensive engineering analysis by a qualified professional engineer registered in the State of Missouri. Use performance requirements and design criteria as indicated on the Structural Drawings and Sheet S0.1.
 - 3. For batting tunnel system; provide and submit delegated design for posts and footings, and tensioned net system.
 - 4. For foul pole and concrete footing based on ASCE 7-10 – 105 MPH wind, exposure B at a minimum.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer employing workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each type of athletic equipment through one source from a single manufacturer.
- C. Standards: Provide athletic equipment complying with or exceeding requirements of authorities having jurisdiction.
- D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 FOOTBALL AND SOCCER GOAL

A. Football and Soccer Combination Goal Set with Net for natural grass installation: Provide products meeting all latest NFHS soccer and football rules and requirements:

1. Product: Subject to compliance with requirements, provide Sportsfield Specialties; Model GPKS20 HS2.0 Original Goal Pak, or pre-approved equal product by one of the following:

- a. Aalco Manufacturing Co.
- b. Draper.
- c. Jaypro.
- d. Porter Athletic, Inc.

2. Description:

- a. Set of two.
- b. Football goal with 8 feet offset and adjustable 20-foot uprights with baseplate type mounting system on concrete footing.
- c. Soccer goal with integrated mobility wheel kit and square posts.

1) Product: Subject to compliance with requirements, provide the following or approved equal:

- a) SSI; Model SG824S.

d. Goal Post Pads: Set of two with 6-foot height round, fully encased vinyl pad and custom printed name of school mascot provided by Owner.

1) Product: Subject to compliance with requirements, provide the following or approved equal:

- a) Sportsfield Specialties; Model GP4590R Full-WDIGITAL.

e. Access frame kit for football base sleeve with manufacturer installed synthetic turf on cover.

f. Integral soccer goal safety tie-down system.

g. Football Goal Color: Standard Yellow with wind directional flags.

3. Provide Delegated Design for concrete footing per manufacturer and complying with all specified structural loads and applicable codes.

B. Soccer Goal Set with Net:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sportsfield Specialties; Model SG2S with mobility wheel kit and safety tie-down system at football

goal post, with optional staggered 8'-4" soccer end-line position, or pre-approved equal product by one of the following:

- a. Aalco Manufacturing Co.
- b. Draper.
- c. Jaypro.

2. Description:

- a. Regulation soccer goal with square posts (8 feet high by 24 feet long).
- b. Standard Post Color: White.
- c. Netting: White 4mm braided 4-inch square mesh nylon net with welded net clips.

2.2 DISCUS CAGE

A. Basis-of-Design Product: Subject to compliance with requirements, provide SportsField Specialties; Model DCHS, or pre-approved equal product by one of the following:

1. Aalco Manufacturing Co.
2. Aluminum Athletic Equipment Company.

B. Description: Provide high school discus cage with ground sleeves and netting system.

1. 2-7/8-inch O.D., 0.203 wall, 6063 T6 aluminum tube with rolled offset and powder-coat finish per manufacturer.
2. Post Height: 14 feet.
3. Net Height: 13.6 feet.
4. Six posts per cage with optional ground sleeves for 34.92-degree sector with front entry.
5. Provide Optional Safety Net: 7' H. x 63' L. #36 (1-3/4-inch square mesh) nylon black twine on outside of net posts.
 - a. Product: Subject to compliance with requirements, provide SSI; Model DCHSBNS or approved equal.
6. Main Nets: heavy-duty nylon 6 material with 180 lb. break strength, UV stabilized.
7. Schedule 40 PVC ground sleeves.
8. Provide Delegated Design for concrete footing per manufacturer and complying with all specified structural loads and applicable codes.

2.3 POLE VAULT BOX AND COVER

A. Pole Vault Box:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sportsfield Specialties; Model PVBSSW, 13-gauge #304 stainless steel construction with integral drainage system, powder-coated, or pre-approved equal product by one of the following:

- a. Aalco Manufacturing Co.
 - b. Aluminum Athletic Equipment Co.
2. Color: White.
- B. Provide stainless steel pole vault box cover with matching finish.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Aalco Manufacturing Co.
 - b. Aluminum Athletic Equipment Co.
 - c. Sportsfield Specialties.

2.4 LONG/TRIPLE JUMP SAND PITS

- A. Long Jump/Triple Jump Sand Pits:
1. Basis-of-Design Product: Subject to compliance with requirements, provide aluminum sand pit form system (3-meters by 7-meters) with cover ledges by SportsField Specialties; Model SPCLHS High School Jump Pit System with cover ledges assembly for future aluminum cover system or pre-approved equal product by one of the following:
 - a. Aalco Manufacturing Co.
 - b. Aluminum Athletic Equipment Co.
 2. Sand Pit Mesh Cover: Provide weighted double layer vinyl-coated mesh long/triple jump pit covers designed to completely cover the sand pit. Provide optional custom school logo printed by manufacturer on each cover.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide SSI; Model SPCVRMD or pre-approved equal.

2.5 SHOT PUT RING THROW FORM AND TOE BOARD SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sportsfield Specialties; Model TFSP Throw Form System with 84-inch diameter ring and toe board with depressed pad or pre-approved equal product by one of the following:
1. Aalco Manufacturing Co.
 2. Aluminum Athletic Equipment Co.

2.6 DISCUS RING AND THROW FORM SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sportsfield Specialties; Model TFD, modular aluminum form with integral discus ring and drainage tubes

for surface drainage into #57 aggregate layer below slab, or pre-approved equal product by one of the following:

1. Aalco Manufacturing Co.
2. Aluminum Athletic Equipment Co.

2.7 SHOT PUT SECTOR EDGE

A. Description: Provide shot put sector edging, connectors and stakes:

1. 6-inch by 6-inch solid core recycled plastic timbers with pre-drilled holes for galvanized steel ground anchors.
2. Environmentally safe, non-toxic, arsenic-free recycled solid plastic timber with 20% glass reinforcing agent and 25-year warranty for outdoor use with earth contact.
3. Ground Anchors: 1/2-inch diameter galvanized steel anchor with integral steel cap set flush with top of timber.
4. Color: Manufacturer's standard beige color that closely matches specified brown limestone screenings within shot put sector.
5. Product: Subject to compliance with requirements, provide products by one of the following:
 - a. Aalco Manufacturing Co.
 - b. American Composite Timbers, Inc.
 - c. Plasti-Tek Sales, Inc.
 - d. SelecTech Timbers.

2.8 FOOTBALL/SOCCER SCOREBOARD SYSTEM

A. Product: Subject to compliance with requirements, provide the following:

1. Daktronics; Scoreboard Model FB-2019; size 8 feet H by 18 feet W by 8 inches D.; with LED display and optional border edge striping in white.
 - a. Provide the following:
 - 1) All-Sport #5000 portable controller with carrying case and two rechargeable batteries.
 - 2) Provide wireless control system for scoreboard.
2. Scoreboard construction to be aluminum alloy 5052 with cabinet color to be selected by the Owner from manufacturer's 150 standard colors to closely match school color.

B. Delegated Design: Provide engineered design details for scoreboard and play clocks, steel tube support posts, concrete footings and all connections as required for a complete outdoor scoreboard installation, including comprehensive engineering analysis by a qualified professional engineer registered in the State of Missouri. Use performance requirements and design criteria as indicated on the Structural Drawings and Sheet S0.1.

- C. Provide and install manufacturer-recommended structural steel I-beam support columns and concrete footings. Steel supports to be hot-dipped galvanized with high-performance paint finish.
 - 1. Scoreboard and Play Clock Support System: Manufacturer's standard high-performance semi-gloss acrylic polyurethane finish. Structural posts to be galvanized with high performance paint finish to match Scoreboard.
 - a. Color: Black.
- D. Football Play Clocks:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Daktronics; Model TI-2015 aluminum two-digit play clock that counts up or down from any number up to 99, or pre-approved equal product by one of the following:
 - a. Fairplay.
 - b. Nevco.
 - c. Translux.
 - 2. Requirements:
 - a. Install per manufacturer's recommendations on high-performance painted galvanized structural steel I-beam support in concrete footing similar to scoreboard supports.
 - b. Dimensions:
 - 1) Height: 2'-4".
 - 2) Width: 3'-4".
 - 3) Depth: 0'-6".
 - 4) Digit Size: 24 inches.
 - c. Accommodate wireless control system compatible with scoreboard.

2.9 BASEBALL/SOFTBALL SCOREBOARD SYSTEM

- A. Product: Subject to compliance with requirements, provide Daktronics; Scoreboard Model BA-2030 (Size: 20-foot width by 6'-6" height by 8-inch depth) with LED display and optional border edge striping in white. Digit height is 18-inch and 15-inch. Provide All-Sport #5000 portable controller with carrying case and two rechargeable batteries. Provide wireless control system for scoreboard. Scoreboard construction to be aluminum alloy 5052 with cabinet color to be selected by the District from manufacturer's 150 standard colors to closely match school color.
- B. Delegated Design: Provide engineered design details for scoreboard and play clocks, steel tube support posts, concrete footings and all connections as required for a complete outdoor scoreboard installation, including comprehensive engineering analysis by a qualified

professional engineer registered in the State of Missouri. Use performance requirements and design criteria as indicated on the Structural Drawings and Sheet S0.1.

- C. Provide and install manufacturer-recommended structural steel I-beam support columns and concrete footings. Steel supports to be hot-dipped galvanized with high-performance paint finish.
 - 1. Scoreboard Support System: Manufacturer's standard high-performance semi-gloss acrylic polyurethane finish. Structural posts to be galvanized with high performance paint finish to match Scoreboard.
 - a. Color: Black.

2.10 BATTING TUNNELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide SportsField Specialties; Model "BTTBQ" custom designed for four (4) tunnels as shown on Drawings. Provide delegated designed tensioned batting tunnel system for baseball and softball, no equal.
- B. Description:
 - 1. Tunnel Size: 14'-9" height by 15'-6" width by 75-foot length.
 - 2. Provide adjustable center net to divide the tunnel in half and adjust location to adapt for softball tunnel.
 - 3. Tension Cable: 1/4-inch black powder coated galvanized aircraft cable with 1/2-inch by 6-inch jaw and jaw turnbuckles as required for custom system.
 - 4. Netting: #36 black nylon, 1-3/4-inch square mesh net with black vinyl enclosed weighted 1/4-inch galvanized chain in vinyl hem at bottom of nets.
 - 5. Provide fixed net extension arms with 3/8-inch steel plate at each post.
 - 6. Provide access door opening in net (2) per tunnel at each end.
 - 7. Posts: 8-inch schedule 40 steel pole, 10 per system, with optional 48-inch steel ground sleeve.
 - 8. Finish: Provide manufacturer's standard powder coated steel finish for all steel components.
 - 9. Color: Black.
 - 10. Black #36 heavy-duty nylon by 1-3/4-inch square mesh net with entrance/exit.
 - 11. Block pulley system for raising and lowering net.
- C. Ground sleeves for posts, post caps and net extension arms to ensure net remains taut and secured to the ground.
- D. Provide and submit delegated design for posts and footings, and tensioned net system.

2.11 FOUL POLES

- A. Foul Poles: Provide set of two each for all baseball and softball fields.

1. Product: Subject to compliance with requirements, provide the following, or pre-approved equal:
 - a. Sportsfield Specialties; Model FPW630 foul poles for baseball and softball.
2. Description: 6-inch O.D. diameter by 30-foot height foul pole with 22-foot height wing.
3. Wing: 4-piece double reinforced bends with 1/8-inch stamped aluminum.
4. Finish: Standard powder coat finish.
5. Color: Yellow for baseball and orange or white for softball, as selected by the Owner from manufacturer's full range of colors.
6. Provide Delegated Engineering for foul pole and concrete footing based on ASCE 7-10 – 105 MPH wind, exposure B at a minimum.

2.12 BASEBALL PITCHING MOUND

- A. Product: Subject to compliance with requirements provide the following or approved equal:
 1. Sportsfield Specialties; Model Porta Pitch PPRC aluminum baseball pitcher's mound for synthetic turf fields.
- B. Description:
 1. Mounds shall meet official MLB, NCAA, and NFHS size.
 2. Mound to be covered in turf matching the turf infield color with insert for polymer enhanced reddish/brown calcined clay product equal to "Hilltopper" by the manufacturer.
 3. Constructed of structural aluminum with aluminum sheathing and covered with 6mm rubber sport surfacing and synthetic turf matching the infield turf color.
 4. 18-foot diameter with 10-inch slope.
 5. Six-piece construction with interlocking flanges.
 6. Integral pitching rubber.
 7. Mound will be surfaced with red clay colored synthetic turf matching the infield turf.
 8. Mound to have insert for Hilltopper calcined clay for center section.
 9. Mound to be semi-permanent and movable with manufacturer provided wheel set for all sections.
 10. Provide manufacturer's standard 10-year warranty.

2.13 BASEBALL BULLPEN PITCHING MOUNDS

- A. Product: Subject to compliance with requirements provide the following or approved equal:
 1. Beacon Athletics; Proper Pitch Portable Game Mound; provide 10-inch height senior mounds in each bullpen per Drawings.
- B. Mound Construction: Polyurethane foam core and completely covered with synthetic nylon AstroTurf per manufacturer. A durable 6 mm rubber pad is inlaid in the landing area below the turf.

- C. Mound Size: 10-inch height by 8'-3" width by 11'-6" length.

2.14 BASES, HOME PLATES, AND PITCHING RUBBER

A. Bases:

1. Product: Subject to compliance with requirements, provide the following or approved equal:
 - a. Sportsfield Specialties; LGHIBD Hollywood Impact.
2. Description:
 - a. Two bases and one double first base (softball only) with ground anchors and anchor plugs for each field.
 - b. Provide 30-inch by 15-inch by 2-1/2-inch with 4-inch stanchions and bases of official base size
3. Home Plates: Official base size for baseball and softball:
 - a. Product: Subject to compliance with requirements, provide the following or approved equal:
 - 1) Schutt; Pro Home Plate.
 - b. Description:
 - 1) Rugged molded construction with stanchion mounted steel plate.
 - 2) Include ground anchor.
4. Pitching Rubbers: Size for baseball and softball:
 - a. Product: Subject to compliance with requirements, provide the following or approved equal:
 - 1) Sportsfield Specialties; Model LGLBMPR224 Dual Stanchion Removable Pitching Rubber.
 - b. Description: Dual stanchion ground anchor and regulation 6-inch by 24-inch pitching rubber size for baseball and softball.

2.15 BALLFIELD TOP RAIL PADDING FOR CHAIN LINK FENCES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide SportsField Specialties Chain Link Post and Top Rail Padding (CLTR) as manufactured from EcoGUARD or approved equal as shown on the Drawings.

1. 18-oz. UV resistant, extruded vinyl, fully encasing a 3-inch thick high-impact polyurethane foam.
2. Two 1.5-inch wide vinyl flaps with #2 stainless steel grommets factory inserted at 12-inches on center.
3. Provide with manufacturer's standard attachment system for secure tight connection.
4. Color: Yellow or as selected by the Architect from manufacturer's full range of colors.

2.16 DUGOUT EQUIPMENT AND ACCESSORIES

- A. Products: Subject to compliance with requirements, provide the following dugout equipment and furnishings or approved equal:
- B. Dugout Benches: Provide and install Two-Tier Polyboard team benches; Sportsfield Specialties model PTBTT12; 12-foot length team bench with standard powder coated aluminum support system, surface mounted to concrete substrate. Each dugout to have a minimum of 34-feet of bench length as a custom design or 3-twelve feet benches end-to-end for 36-feet of bench length.
1. Provide mounting brackets and concrete wedge anchors.
 2. 2-inch square aluminum tube frame system with end panels with holes for bolting multiple units together.
 3. Powder coat Frame Color: "Azure Blue" or as selected by Architect from standard colors.
 4. Polyboard Seat and Back Color: "Weather Wood" or as selected by Architect from full range of standard colors.
- C. Helmet Cubby System: Provide and install Helmet Cubby and Coat Rack wall mounted unit; Sportsfield Specialties model SUWHCCRWM; 8-foot length with cubby storage for six units at 24-inch height.
1. Material: 3/4-inch exterior grade plywood with hardwood ash edges and support brackets assembled with stainless steel screws.
 2. Finish: Marine grade water-based polyurethane.
 3. Wall Fasteners: Mount to masonry wall with concrete wedge anchors per manufacturer's recommendations. Ensure mounting of units above player's head height based on sitting on top tier of bench.
 4. Helmet storage: 16.5" by 15.13 x 18" depth minimum.
 5. Hooks: Provide hardwood dowel for coat hook.
 6. Quantity: Provide multiple of four 6-compartment units in each dugout for a total of 24-cubbies per dugout.
 7. Finish Color: Closely match the Polyboard seat color or as selected by Architect from full range of standard colors.
- D. Bat Racks: Provide and install floor mounted Bat Rack for 15 bats in each dugout; Sportsfield Specialties model SUABRPL15; 4" diameter aluminum bat storage tubes (Typ. 15x); Heavy-duty aluminum construction; powder coat finish.
1. Powder Coat Color: "Azure Blue" or as selected by Architect/Owner from standard colors.

2. Fasten with 1/2-inch stainless steel wedge anchors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions with Installer and Owner present. Layout all components with installation tolerances, operational clearances, and other conditions affecting performance in field prior to actual installation.
 1. Verify critical dimensions.
 2. Inspect all surfaces and materials in which athletic equipment is to be installed for unsatisfactory conditions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions. Complete equipment field assembly, where required.
- B. Unless otherwise indicated, install athletic equipment after other finishing operations, including painting, have been completed.
- C. Permanently Placed Athletic Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with field layout.
 1. Finish Grade Elevation: Coordinate installed heights of equipment with specified finish grades.
- D. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed athletic equipment to structural support and for properly transferring load to in-place construction.

3.3 CLEANING AND PROTECTION

- A. After completing athletic equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure athletic equipment is without damage or deterioration at time of Substantial Completion.

- C. Replace athletic equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 116803

SECTION 122413 - ROLLER WINDOW SHADES

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. Manually operated roller shades with single rollers.
- 2. Manually operated roller shades with double rollers.
- 3. Motor-operated roller shades with single rollers.

- B. Related Requirements:

- 1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
- 2. Section 079200 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.3 ACTION SUBMITTALS

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

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

- B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

- 1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

- C. Samples: For each exposed product and for each color and texture specified.

- D. Samples for Initial Selection: For each type and color of shadeband material.

- 1. Include Samples of accessories involving color selection.

- E. Product Schedule: For roller shades. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain roller shades from single source from single manufacturer.
- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 - 1. Bead Chains: Nickel-plated metal.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Chain tensioner, jamb mounted.

ROLLER WINDOW SHADES

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- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 - 1. Roller Drive-End Location: Right side of interior face of shade
 - 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller
 - 3. Shadeband-to-Roller Attachment: Manufacturer's standard method
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- F. Shadebands:
 - 1. Shadeband Material: Light-filtering fabric
 - 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material
 - b. Color and Finish: As selected by Architect from manufacturer's full range
- G. Installation Accessories:
 - 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 3 inches
 - 2. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 3 inches
 - 3. Endcap Covers: To cover exposed endcaps.
 - 4. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 4 inches
 - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.

5. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.
 - a. Closure-Panel Width: 2 inches
6. Installation Accessories Color and Finish: As selected from manufacturer's full range
- H. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 1. Bead Chains: Nickel-plated metal.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Chain tensioner, jamb mounted.
 - I. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Roller Drive-End Location: Right side of interior face of shade
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method
 - J. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
 - K. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
 - L. Shadebands:
 1. Shadeband Material: Light-filtering fabric
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material
 - b. Color and Finish: As selected by Architect from manufacturer's full range
 - M. Installation Accessories:
 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 3 inches

2. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 3 inches
3. Endcap Covers: To cover exposed endcaps.
4. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 4 inches
 - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
5. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.
 - a. Closure-Panel Width: 2 inches
6. Installation Accessories Color and Finish: As selected from manufacturer's full range

2.2 MOTOR-OPERATED, SINGLE-ROLLER SHADES (WT-03)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Nysan Solar Control Systems).
 2. WindowTex
- B. Motorized Operating System: Provide factory-assembled, shade-operator system of size and capacity and with features, characteristics, and accessories suitable for conditions indicated, complete with electric motor and factory-prewired motor controls, power disconnect switch, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.
 1. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 2. Electric Motor: Manufacturer's standard tubular, 120 volt, enclosed in roller.
 3. Limit Switches: Adjustable switches interlocked with motor controls and set to stop shades automatically at fully raised and fully lowered positions.
 4. Operating Features:
 - a. Shade controls shall include one switch for each bank of shades in Media Center.

- b. In addition to manual control switches, system shall have capability to accept low-voltage control signal from AV system controls to raise/lower all shades in both spaces simultaneously.
 - c. Capable of accepting input from building automation control system.
 - d. Override switch.
 5. Products: Subject to compliance with requirements, provide one of the following or approved equal:
 - a. Mecho Savant SmartControl 12 controller.
 - b. Mecho MNI Mechonet Network Interface.
- C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 1. Roller Drive-End Location: Right side of interior face of shade
 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers that are operated by one roller drive-end assembly.
- F. Shadebands:
 1. Shadeband Material: Light-filtering fabric
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material
 - b. Color and Finish: As selected by Architect from manufacturer's full range
- G. Installation Accessories:
 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - a. Shape: L-shaped
 - b. Height: Manufacturer's standard height required to conceal roller and shadeband assembly when shade is fully open, but not less than 3 inches
 2. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.

- a. Height: Manufacturer's standard in height required to enclose roller and shadeband assembly when shade is fully open, but not less than 3 inches.
3. Endcap Covers: To cover exposed endcaps.
4. Recessed Shade Pocket: Rectangular, extruded-aluminum enclosure designed for recessed ceiling installation; with front, top, and back formed as one piece, end plates, and removable bottom closure panel.
 - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 4 inches
 - b. Provide pocket with lip at lower edge to support acoustical ceiling panel.
5. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.
6. Bottom (Sill) Channel or Angle: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.
7. Installation Accessories Color and Finish: As selected from manufacturer's full range

2.3 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701 Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Light-Filtering Fabric: Designed for filtering visible light when shades are fully closed; fabricated from woven shade cloth in two non-directional basket-weave patterns. Basis of Design – Mechoshade Thermo Veil 1000 or equal.
 1. Source: Roller shade manufacturer
 2. Type: PVC-coated fiberglass
 3. Weave: Basketweave
 4. Orientation on Shadeband: Up the bolt
 5. Openness Factor: Approx 2-3 percent.
 6. Color: As selected by Architect from manufacturer's full range

2.4 ROLLER SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.

- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
 - 1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4 provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
 - 2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Electrical Connections: Connect motor-operated roller shades to building electrical system.
- C. Roller Shade Locations: As indicated on Drawings

3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 122413

SECTION 123216 – MANUFACTURED PLASTIC-LAMINATE CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Section 061000 "Rough Carpentry" for wood blocking to support and attach casework.
- C. Wall base is specified in Section 096513 "Resilient Base and Accessories."

1.2 DESCRIPTION OF THE WORK

- A. The Manufactured Casework subcontractor shall furnish, deliver, set in place, and make ready to use all Manufactured Casework and related items/materials as herein specified in the rooms scheduled
- B. Related Work: Except as noted, mechanical, plumbing or electrical contractors will provide all pipe, conduit, ductwork, sinks (except where scheduled), faucets, traps, strainers, supplies, stops, air/gas valves, fittings, switches, lights, electrical receptacles, wire, rough-in and final connection.

1.3 QUALITY ASSURANCE

- A. Quality Standards: Except as otherwise shown or specified, comply with specified provisions of the Architectural Woodwork Institute (AWI) "Quality Standards" Custom Grade.
- B. Manufacturer/Installer Qualifications: Casework manufacturer shall provide a list of completed installations, date of completion, size of project, client and Architect dating back 5 years upon request. Manufacturers shall also show evidence of financial stability, and adequate plant facilities for a project of this size. A sample cabinet shall be provided upon request.
- C. All upper cabinets shall have inside clear dimension of 12 inches to accommodate binders.
- D. Upper cabinets shall display load capacity on interior of cabinet door.

1.4 SUBMITTALS

- A. Shop Drawings: Within 30 days following contract award, the casework subcontractor shall submit rough-in drawings to the Architect showing centerline dimensions of all sink, mechanical and electrical items contained in manufactured casework. Also submit color samples.
- B. Within 90 days following contract award, the manufactured casework subcontractor shall submit to the Architect complete shop drawings, including typical cabinet construction details and elevations.
- C. Samples: Submit the following samples:
 - 1. Exposed cabinet hardware, one unit of each type and finish.
 - 2. Actual samples of the full plastic laminate color line. Colors as selected by the Architect. Architect shall select colors from the manufacturers standard colors but not be limited by quantity of colors used or specific color palettes/patterns for certain casework.
 - 3. A full-size door/drawer base cabinet and upper cabinet shall be submitted and approved before any fabrication of the plastic laminate casework is to begin.
- D. Manufactured casework subcontractor is responsible for all quantities.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect casework during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver casework, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate casework which have been completed in installation areas.

1.6 JOB CONDITIONS

- A. Conditioning: Installer shall advise the General Contractor of temperature and humidity requirements for casework installation areas. Do not install casework until required temperature and relative humidity have been stabilized and will be maintained in the installation areas.

1.7 SCHEDULING AND COORDINATION

- A. Manufactured casework subcontractor shall coordinate with the mechanical & electrical contractors to assure proper working clearances, receptacle/fixture locations, and all connection/fittings necessary to function properly.

PART 2 - PRODUCTS

2.1 BASIC MATERIALS

- A. Quality Standards: For the following types of manufactured casework and materials; comply with indicated standards as applicable:
1. Plastic Laminate-Faced Cabinets and Countertops: AWI Section 400, Premium Grade.
- B. General Casework Materials
1. Hardwood: Any closed-grain hardwood complying with requirements for premium grade. Surfaced and sanded on all exposed faces and edges.
 2. Plywood, General: Exterior 7-ply glue softwood complying with the requirements for premium grade.
 3. Particle Board: Shall be 45# density, balanced construction with moisture not to exceed 8% and shall meet or exceed Commercial Standard C.S. 236-66.
 4. Solid Wood Blocking: Standard No. 2 fir, hemlock or yellow pine, K.D., allowable unit stress not less than 1200 F.
 5. Hardboard: 1/4 inch tempered smooth both sides; shall meet or exceed Commercial Standard CS-251, and Federal Specification LLL-B-00810.
 6. PVC Edge Banding:
 - a. 3 mm thick; sized to suit the material thickness.
 - b. 1 mm thick, sized to suit the material thickness.
 7. Steel Tube Legs/Frames and Steel Angles and Tees:
 - a. Steel Tube Legs/Frames: 1-inch-by-1-inch-by 1/8-inch steel tube welded to tube or 3/16-inch plate steel.
 - b. Steel Angles and Tees of the sizes shown on the details.
 - c. Metal wall bracket.
 - d. All steel to steel connections shall be continuously welded and ground smooth. All rough edges shall be ground smooth. All steel shall be primed and painted black unless directed otherwise; paint as approved by the Architect.
 8. Melamine: Thermally fused with balanced construction. Core shall match Particle Board as specified.
- C. Plastic Laminate: Comply with NEMA LD-3 for type, thickness, color, pattern and finish indicated for each application. Provide a matte finish surface in the manufacturer's standard wood grains and solid colors. The option of colors or wood grain shall be available for all casework.

2.2 PLASTIC LAMINATES (HPL)

A. Exposed Surfaces:

1. Provide High Pressure Laminate in the grades indicated for the following types of exposed (exterior and open interior) surfaces:
 - a. All Horizontal Surfaces: GP-50 (0.050-inch nominal thickness).
 - b. All Vertical Surfaces: VS-30 (0.030-inch nominal thickness).

B. Semi-Exposed Surfaces:

1. Finish all semi-exposed surfaces with Thermally Fused Melamine with 62% resin content; shall meet or exceed ASTM D-L-300 and NEMA Test LSI-2.06.

C. Unexposed Surfaces:

1. Provide minimum of the same material type for balanced construction on any given panel.

2.3 CABINET HARDWARE AND ACCESSORY MATERIALS

A. General: Provide cabinet hardware and accessory materials associated with Manufactured Casework.

B. Hardware Standards: except as otherwise indicated, comply with ANSI A 156.9 "American National Standard for Cabinet Hardware".

C. Quality Level: Type 2 (institutional), unless otherwise indicated.

D. Cabinet Door Hardware: Provide hinges, catches and pulls of types indicated, to accommodate each door size and style.

1. Hinges shall be brushed aluminum, RPC #851, overlay reveal, 5 knuckle, 2-1/2-inch institutional type with hospital tip and tight pin. Two (2) per door for doors under 42 inches, three (3) for doors over 42 inches.
2. Pulls shall be wire type, with anodized or colored finish as selected by Architect.
3. Provide magnetic catches with minimum 6 lb. pull. One per cabinet door 42 inches or less or in height, 2 per door on doors taller than 42 inches.

E. Drawer Slides: Provide slides of types indicated, to accommodate each drawer.

1. Equip each drawer with side-mounted or under mounted, ball bearing, nylon roller drawer slides with a minimum load capacity of 75 lbs. per pair, unless noted otherwise.
2. Unigrass system integrated door slide.

F. Shelf Supports: For shelving indicated as "adjustable"; provide one of the following:

1. Knappe & Vogt #346 nickel plated metal shelf support with 1/4-inch pin diameter by 3/8-inch long, in holes 2 inches on center in cabinet sides (four per shelf).
 2. Knappe & Vogt #255, nickel plated steel standards with #256 shelf clips (4 per shelf).
 3. Double-pin, self-locking shelf clip.
- G. File Drawer Hardware: Provide one of the following:
1. #476FZC - 7 5/8-inches by 10 3/4-inches letter-size file follower, #476TZC - 2 1/4-inches by 1/4-inch file follower track, all as produced by Knappe and Vogt.
 2. Unigrass Pendaflex railing system.
- H. Coat Hooks: Ives No. 582 double hook, cast aluminum, burnished finish. At Classroom Cubical units, provide (2) double hooks per top shelf (6 double hooks per casework unit).
- I. Locks: Provide the following, where scheduled. One (1) lock per door or drawer, two (2) keys per lock, all locks within a room keyed alike. Provide a grand masterkey, which will operate all casework locks. Provide ten (10) copies of the grand masterkey. See attached schedule.
1. Drawers and Single Door Base/Wall/Tall Cabinets: 5E Series 3/4-inch Utility Cylinder for Cabinet Applications as manufactured by Best Lock Corporation, Indianapolis, Indiana. Five (5) tumbler, 5EC4B outward offset cam with Type C Lost Motion cam action allowing removal of the key in the locked or unlocked position. Size cam length for secure locking. Provide options/accessories as necessary for non-binding operation and secure locking.
 - a. Approved Substitution: CompX International.
 2. Double Door Base/Wall Cabinets: Same as item 1 above except use a straight cam to lock behind the inactive door. Provide a #238 Elbow Catch as manufactured by National Lock Hardware, on the inactive door. Locate the lock adjacent to the door handle on the active door; locate the elbow catch, on the inactive door, near the location of the lock on the active door.
 3. Double Door Tall Cabinets: Same as item 2 above except delete the elbow catch and provide a #1055 chain bolt with angle strike, 3-inch bolt, 24-inch chain as manufactured by Stanley Hardware Company. Locate the chain bolt at the top of the inactive door.
- J. Closet Rods: #660SS (.087) steel tubing, 1-1/16-inch O.D. closet pole; (2) #734 polished chrome finish closet pole flange; both as manufactured by Knappe & Vogt Manufacturing.
- K. Mirrors: Provide 10-inch by 12-inch by 1/4-inch mirror, edges ground smooth and polished. Secure mirror to cabinet door by Knappe & Vogt model #5198PLAS. Provide (1) for each Teacher's Wardrobe unit
- L. Vent Grilles: Continuous linear bar diffusers as manufactured by Titus, represented by Triangle Sales, Inc., 5420 Antioch Drive, Shawnee Mission, KS 66201.

1. Model CT-480 with Type 12, 3/4-inch wide border and concealed fastening Type C; widths shown or if not shown, 5 inches wide or as wide as space allows.

M. Door Stops: Provide wall stop or other stop approved by Architect at locations where full swing of casework unit doors is impeded by adjacent casework equipment or building components which may cause damage to door finish or hardware.

2.4 TYPICAL DESIGN AND CONSTRUCTION FEATURES

A. Basic Features:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Precision Craft.
 - b. Stevens Industries, Inc.
 - c. TMI.
2. General: Comply with the details shown and specifications for profile, elevation, and construction of Manufactured Casework; and, where not otherwise shown, comply with applicable AWI Quality Standards, unless approved otherwise.
 - a. Scheduled heights include thickness of countertops.
3. Substitutions: Proposals of other methods of construction and materials of equal size, quality, and function will be considered and approved PRIOR TO THE BID DATE ONLY.
4. Measurements: Before proceeding with fabrication of casework that is required to be fitted to other construction, verify field dimensions and obtain shop drawing details of related items as required for an accurate fit.
 - a. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders, fillers, and edges to allow for subsequent scribing and trimming of casework for accurate fit.
5. Type of Cabinet Construction: Flush Overlay construction, with P.V.C. edging and square door and drawer corners. Square corner door and drawer fronts require adjustable drawer fronts for perfect alignment - secured with non-adjustable fastening following final alignment.
6. All backs, ends and interiors exposed to view shall be finished.
7. Fillers shall completely close openings at all sides, tops and bottoms unless noted otherwise, and shall be same thickness, core material and finish as adjacent materials, but shall in no case be less than 3/4-inch thick.
8. Shelves: 1-inch thick for ALL shelves.

9. The exposed edges of all cabinet bottoms, tops, sub-tops, ends, vertical and horizontal dividers shall be PVC edge banding.
10. Casework subcontractor shall cut all openings for other trades.

B. Countertops:

1. General: Provide countertops on all casework 60" or less in height. Provide back and end splashes when top abuts a wall, column or casework of a higher elevation. Splash shall be 4 inches high, unless otherwise noted. Splash shall terminate at face of adjoining casework. No back or end splash on free standing items, unless otherwise noted.
2. For self-supporting countertops, Design countertops for heavy duty use. Design professionals shall include fastener design information for the type of substrate the countertops are installed on to assure permanency of installation.
3. For countertops containing sinks, specify solid surface countertops, except at epoxy countertops with integral sinks in Science Rooms, as determined by Owner's representative.
 - a. Countertop core shall be 1-1/8-inch Particle Board. Total Countertop thickness of 1-1/4 inches.
 - b. 3mm PVC edge banding on all exposed surfaces.
 - c. All countertop splices shall have blocking full depth.
 - d. Tops shall be continuous over a minimum of (2) items; in the maximum lengths possible.
 - e. Backsplash shall be mounted to countertop using the Baer Smartclip system TJ-Clip.
 - f. Silicone clear caulk joint between backsplash and top. Joint between wall and backsplash shall not be caulked except at countertops with sinks.
 - g. Manufactured casework subcontractor shall cut all necessary openings/holes in countertops for the various trades. Templates shall be provided by the various trades.
 - h. At all countertop cut openings, brush clear polyurethane on all exposed particleboard.
4. Plastic Laminate: All countertops shall be surfaced with plastic laminate unless noted otherwise in the Architectural Drawings. Plastic laminate to be applied to top and bottom faces of countertop and backsplash.
 - a. Plastic Laminate Type: GP-50 (0.050-inch nominal thickness) as manufactured by Wilson Art, Formica, and Nevamar; colors as selected by the Architect.
 - b. Substrate: 45 lb. density Particle Board unless noted otherwise. Nominal countertop thickness 1-1/4-inches.
 - c. Backer sheet for balanced construction.
 - d. Color: As indicated on Finish Schedule

C. Sub-Base Construction:

1. Sub-base shall be constructed of 3/4-inch exterior grade 7-ply plywood.

2. Provide independent sub-base for each base cabinet. No gaps in sub-base are allowed greater than 6 mm.
3. Attach sub-base to cabinet from the bottom. No exposed fasteners will be allowed at interior of base cabinet.
4. Sub-base vertical supports shall be centered on centerline of sides and back panels of each base cabinet. Vertical center support required at 24 inches minimum.
5. Provide a 3-inch D. by 4-inch H. toe space. Resilient base shall be by others.

D. Wall and Base Cabinet Top and Bottom:

1. Wall and Base cabinet bottoms shall be 3/4-inch two-sided thermally fused melamine.
2. Base cabinet sub-top shall be 3/4-inch two-sided thermally fused melamine as a full top or a minimum of (2) 6-inch rails.
3. Wall cabinet tops shall be 3/4-inch two-sided thermally fused melamine on the interior, balancing sheet on the top.
4. Wall cabinet bottoms shall be 3/4-inch particleboard with VS-30 HPL both sides.

E. Cabinet Ends:

1. Finished Ends: 3/4-inch particleboard with VS-30 HPL on exterior and interior. Laminate on interior to match melamine finish and color.
2. Unfinished Ends: 3/4-inch two-sided thermally fused melamine.
3. Holes drilled 32 mm on center; maximum 6 inches from top and bottom on the interior for shelf supports.

F. Cabinet Backs:

1. Concealed backs shall be 1/2-inch two-sided thermally fused melamine.
2. Exposed backs shall be 3/4-inch particleboard with VS-30 HPL on the exterior and interior.
3. Cabinet backs shall be fully captured and glued to cabinet panels in dado joint inset 3/4-inch from back of cabinet. (2) 6-inch hanging rails shall be provided flush with cabinet back.
4. Wall cabinet uppers shall have hanging rails mechanically fastened to cabinet sides and back. Stapling of hanging rails is not an acceptable means of mechanical fastening.

G. Shelves:

1. All shelves shall be 1-inch thick two-sided thermally fused melamine.
2. 3 mm PVC edge banding on front edge of every shelf.
3. All shelves shall be adjustable unless noted otherwise.
4. Provide (1) in door base cabinets (excluding sink base) 36 inches or less in height, (1) in door wall cabinets 30 inches or less in height, (5) in tall storage cabinets unless noted otherwise.
5. No shelf shall be longer than 48 inches.

H. Cabinet Joinery:

1. All horizontal case components shall be doweled and glued, or dadoed and glued construction.
2. All concealed backs to be captured on all four sides; dadoed and glued.
3. All finished backs shall be doweled and glued.

I. Drawer Box Construction:

1. Drawer construction shall be one of the following:
 - a. 1/2-inch hard wood dovetailed on all four sides. Drawer bottom shall be 1/2-inch particleboard with two-sided thermally fused melamine or 1/4-inch hardboard dadoed and glued on all four sides.
 - b. 1/2-inch particleboard with two-sided thermally fused melamine on all four sides of drawer box and bottom. Sub-front lock shoulder jointed and glued to sides. Back and bottom dadoed and glued to sides. 0.5 mm PVC on all exposed top edges.
 - c. Gras Uni-Drawer system with bottom and back 3/4-inch particleboard with two-sided thermally fused melamine. 0.5 mm PVC on all exposed top edges.

J. Door, Drawer, and Apron Fronts:

1. 3/4-inch particleboard with VS-30 H.P.L. on the exterior and on the interior. Interior VS-30 to match case interior color and finish.
2. 3 mm PVC on all exposed edges.
3. Provide 1/8-inch radius on all four outside corners; interior and exterior face.
4. No door shall be greater than 24 inches in width.
5. Drawer slides shall be adjusted so that no drawer front makes contact with the cabinet body in the closed position.

K. Edging:

1. 3 mm PVC edging on all tops.
2. 1 mm PVC edging on all exposed cabinet edges.
3. 3 mm PVC edging on front of all shelves.
4. 3 mm PVC edging on all door, drawer, and apron front edges.
5. 0.5 mm PVC minimum on top edges of drawer boxes.

2.5 SPECIALTY CABINET DESIGN AND CONSTRUCTION FEATURES

- A. General: Comply with previously specified "Typical Design and Construction Features" for materials and methods not listed herein. Some of the casework elevations are based on manufacturer's catalogs. Casework elevation model numbers do not correspond with any particular manufacturer's standard numbers or constraints and should not be interpreted to allow manufacturer's standard construction methods, colors restrictions or other deviations from specified requirements.

B. Tall Casework:

1. Teachers' Wardrobe (AWI 531): Provide the following:
 - a. Coat hanging space 12 inches wide with closet rod mounted 5-0 A.F.F. and fixed shelf 5-4 A.F.F.
 - b. (2) legal size file drawers in bottom of cabinet
 - c. (1) fixed shelf atop file drawers
 - d. (3) adjustable shelves; (1) mirror mounted 5-0 A.F.F. on backside coat space of door.
 - e. All wardrobes shall be attached to the wall rather than portable.

C. Art Casework:

1. Art Cabinet with Vertical Storage Slots: Provide (4) equally spaced 1/4-inch hardboard vertical dividers blind dadoed into the top, bottom, dividing the cabinet into (5) equal compartments.
2. (4) Knap & Vogt drawer slides, model #1483 mounted top and bottom of cabinet (2 per side); closed toe space.
3. Storage art drawers shall consist of metal side rails and 3/4-inch particleboard bottoms.

D. Mail Casework:

1. Mailboxes shall be Hamilton Casework Solutions Sort Modules. See backup information. Coordinate mailbox counts and size requirements with Owner.

E. Special Casework:

1. Classroom Cubical (Lifeskills): Provide (2) 1-inch particleboard vertical dividers, blind dadoed into top and bottom, dividing cabinet into (3) equal compartments; (2) 3/4-inch particleboard adjustable shelves per compartment; (2) double-prong coat hooks per upper shelf.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition casework to average prevailing humidity condition in installation areas prior to installing.
- B. Provide and deliver necessary anchoring devices to be built into substrates, for proper support of the casework, well in advance of time substrates are to be built.

3.2 INSTALLATION

- A. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8 inches on 8'-0" for plumb and level (including countertops).
- B. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts as directed by the Architect.
- C. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.
- D. Casework: Install without distortion so that doors and drawers will fit openings properly and be accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

- A. Repair damaged and defective casework wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace casework. Adjust joinery for uniform appearance.
- B. Clean hardware, lubricate and make final adjustments for proper operation.
- C. Protection: Installer of architectural casework shall advise Contractor of procedures and precautions to maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.
- D. Cover completed work with 4-mil polyethylene film protective enclosure, applied in a manner which will allow easy removal and without damage to woodwork or adjoining work. Remove cover immediately before time of final acceptance.

END OF SECTION 123216

SECTION 123223 – MUSICAL INSTRUMENT STORAGE CABINETS

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 the following:
 - 1. Musical instrument storage cabinets.
- B. Products furnished and installed under this Section:
 - 1. All musical instrument storage cabinets as shown on the Drawings.
 - 2. All mounting and connection hardware and accessories.
- C. Related Sections:
 - 1. Section 123216 "Laminate Clad Educational Casework."

1.3 REFERENCES

- A. American Laminators Assoc. Performance Standard ALA 1985.
- B. ANSI – BHMA Standard A156.9 Grade 1.

1.4 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Music instrument storage cabinets will be specifically designed and engineered for the intended use and will meet the minimum performance characteristics specified herein. Music instrument storage units will be chip and abrasion resistant under normal usage and will protect instruments and cases from damage under normal use.
 - 2. Provide one-piece high molecular polyethylene instrument storage shelving with integral ventilation grooves, designed and engineered to withstand continuous use without surface or front edge breakdown.
 - 3. Individual instrument storage cabinets will be manufactured with thermo-fused polyester laminated panels, finish both faces all components. All end panels shall be factory jigged

and drilled to accept unit-to-unit through-bolting: no conventional wood screws attaching units side-to-side will be permitted. Each instrument storage cabinet will be furnished with an integral base and four steel levelers accessible from within the unit but concealed in final installation.

- B. Manufacturer to provide documentation of following minimum performance requirements:
1. Molded plastic instrument storage shelf shall have a static load capacity of over 1,000 lbs.
 2. Full height solid hinged door for instrument storage units shall support a minimum dynamic live load of 315 lbs., applied at outer edge.
 3. Door hinge shall be welded to door frame in five places, pull-tested to withstand 3,000 lbs.
 4. Instrument storage shelf system shall have a factory warranty of ten years against defects in material and/or workmanship.

1.5 WORK NOT INCLUDED

- A. Architectural woodwork and laminate clad educational casework.
- B. Rubber base.
- C. Padlocks, locks master-keyed to room doors and other special locks.
- D. Blocking within walls.

1.6 SUBMITTALS

- A. Product Data for each type of musical instrument storage cabinet specified.
- B. Shop Drawings for storage cabinets showing plan layout, elevations, ends, cross-sections and showing components in assembly with adjacent materials and products.
- C. Samples for verification purposes of each type of specified finish material. Provide in minimum 6-inch by 6-inch sizes. Samples will be reviewed by Architect-Engineer for color, texture, and pattern only. Compliance with other specified requirements is exclusive responsibility of Contractor.
- D. Quality Control Submittal: Manufacturer's installation instructions.
- E. Contract Closeout Submittals: Maintenance recommendations and warranty.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Pack and ship to avoid damage according to manufacturer's recommendations.
 1. Finish and assemble components in factory before shipment.

2. Ship components in individual sealed, labeled cartons.
3. Deliver components to room designated for installation.

B. Do not accept or install damaged products at the site.

C. Store products in heated indoor storage near point of installation. Retain protective packaging until installing.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install cabinets until all mortar, wet and dust producing work is accomplished.

B. Field Measurements: Obtain required field measurements from the Contractor and indicate on shop drawings.

1.9 WARRANTY

A. Provide manufacturer's written warranty that products not in accordance with requirements of Contract Documents within three years after commencement of warranties shall be corrected promptly after receipt of written notice from Owner. Cabinet shelf shall be warranted for ten years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide Wenger Corporation, catalog numbers shown on Drawings or equal products by one of the following:

1. LSI Corporation of America; a Sagas International company.
2. Stevens Industries, Inc.
3. TMI Systems Design Corporation.
4. Tru-Bilt/Calmar Manufacturing Co., Inc.

2.2 MATERIALS

A. Cabinet Wall Panels: 3/4 inch thick industrial (cabinet) grade particleboard, minimum 48 pcf with thermoset polyester (melamine not acceptable) laminate on both sides for totally finished construction. No backer sheets or unfinished surfaces may be used on unexposed sides.

1. Color: To be selected by the Architect from manufacturer's full range.

B. Cabinet Shelving:

1. Cabinets Up to 27 Inches Wide: One-piece high molecular blow-molded polyethylene with 1-3/8-inch radius front edge. Mount to cabinet walls with one-piece molded rigid ST nylon clip. Shelf shall be replaceable without damage to adjacent surfaces. Doweled shelves will not be permitted.
2. Cabinets Over 27 Inches Wide: One-piece high molecular formed polyethylene with radius front edge and 3/16-inch wall thickness, ribbed for structural integrity, supported by four structural tubular members 1-1/2 inches by 1 inch by 16 gage wall thickness with 14 gage welded end plates.

C. Doors:

1. Compartment Doors: Wave grill doors in 5/16-inch and 1/4-inch diameter steel designed to reduce vibration.
 - a. Hinges: 5-knuckle institutional type hinge, supplied by ISO 9002 vendor. Hinges shall support 315 lbs. dynamic vertical load. Hinge pin shall be 2-3/4 inches long. Hinge shall be fastened to cabinet and door with through-bolt construction; attachment by wood screws not acceptable. Provide two hinges on compartment doors, four on full height doors.
2. Locking Slide-Bolt: All doors shall be factory provided with locking slide-bolt designed for padlocks, with formed steel strike plate through-bolt connected to cabinet end panel, 12 gage steel. Provide clear plastic label holder for identification card insert.
 - a. Color: To be selected by the Architect from manufacturer's full range.

D. Edging: Heat bonded 3mm beveled PVC edge-banding, machine applied using hot-melt adhesives, edges and corners machine profiled for safety.

1. Integral Color: To be selected by the Architect from manufacturer's full range.

E. Finish Hardware:

1. Joinery Hardware: Two inch, 1/4-20 panel connectors with 15mm head diameter, and steel thread inserts shall be utilized to join desired cabinets side-to-side; use factory jigged and drilled joinery holes.
 - a. Color: To be selected by the Architect from manufacturer's full range.
2. Cabinet Levelers: Structural levelers each cabinet, accessible from within the unit, concealed in complete installation; glides with minimum 3/8-inch diameter threaded rod mounted in steel corner brackets. Provide minimum four glides per cabinet, six glides for cabinets with divider panels.

F. Cabinet Back Panel:

1. Standard cabinet back to be 1/4-inch thick prefinished hardboard.
 - a. Color: To be selected by the Architect from manufacturer's full range.

2.3 MANUFACTURED UNITS

- A. Fabricate and package all components in the factory and ship fully assembled or ready to assemble.

2.4 OPTIONS REQUIRED

- A. Vertical Closure Kit. Provide visual closure between wall and cabinet. Construct closure of 3/4-inch thick thermoset polyester composite wood to match cabinet side panels.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation shall be in accordance with manufacturer's instructions.

3.2 ADJUSTING

- A. Adjust all hardware for smooth operation.

3.3 CLEANING

- A. Clean all surfaces of soil.
- B. Remove all packaging materials and construction debris.

END OF SECTION 123216

SECTION 123553.16 - PLASTIC-LAMINATE-CLAD LABORATORY CASEWORK

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. Plastic-laminate laboratory casework.
2. Filler and closure panels.
3. Laboratory countertops.
4. Laboratory sinks.
5. Laboratory accessories.
6. Water, laboratory gas, and electrical service fittings.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking for anchoring laboratory casework.
2. Section 092216 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring laboratory casework.
3. Section 096513 "Resilient Base and Accessories" for resilient base applied to plastic-laminate-clad laboratory casework.

1.3 DEFINITIONS

- A. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches 1200 mm above floor, and visible surfaces in open cabinets or behind glass doors.

1. Ends of cabinets, including those installed directly against walls or other cabinets, are defined as "exposed."
2. Ends of cabinets indicated to be installed directly against and completely concealed by walls or other cabinets are defined as "concealed."

- B. Semiexposed Surfaces of Casework: Surfaces behind opaque doors, such as cabinet interiors, shelves, and dividers; interiors and sides of drawers; and interior faces of doors. Tops of cases 78 inches 1980 mm or more above floor and bottoms of cabinets more than 24 inches 600 mm) but less than 48 inches (1200 mm) above floor are defined as "semiexposed."

- C. Concealed Surfaces of Casework: Include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.
- D. MDF: Medium-density fiberboard.
- E. Hardwood Plywood: A panel product composed of layers, or plies, of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive and faced both front and back with hardwood veneers.

1.4 COORDINATION

- A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.
- B. Coordinate installation of laboratory casework with installation of fume hoods and other laboratory equipment.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For laboratory casework. Include plans, elevations, and attachment details.
 - 1. Indicate types and sizes of cabinets.
 - 2. Indicate locations of hardware and keying of locks.
 - 3. Indicate locations and types of service fittings.
 - 4. Indicate locations of blocking and reinforcements required for installing laboratory casework.
 - 5. Include details of utility spaces showing supports for conduits and piping.
 - 6. Include details of exposed conduits, if required, for service fittings.
 - 7. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
 - 8. Include coordinated dimensions for laboratory equipment specified in other Sections.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet work are complete and dry, and temporary HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Stevens Industries, Inc Advantage Laboratory Casework or comparable product by one of the following:
 - 1. Case Systems Inc.
 - 2. CiF Laboratory Solutions.
 - 3. TMI Systems Design Corporation.
- C. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.
 - 1. Obtain countertops sinks accessories service fittings from casework manufacturer.
- D. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes and similar door and drawer configurations and complying with Specifications may be considered. See Section 016000 "Product Requirements."

2.2 CASEWORK, GENERAL

- A. Casework Product Standard: Comply with SEFA 8 PL, "Laboratory Grade Plastic Laminate Casework."
- B. 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 PLASTIC-LAMINATE CABINETS

- A. Design:

1. Flush overlay.

B. Exposed Materials:

1. Plastic-Laminate Grade: HGS.

a. Colors and Patterns: As indicated by manufacturer's designations.

1) As indicated on Finish Schedule.

2. Unless otherwise indicated, provide specified edgework on all exposed edges.

C. Semiexposed Materials:

1. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semiexposed surfaces unless otherwise indicated.

a. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

2. Thermoset Decorative Panels: Provide thermoset decorative panels for semiexposed surfaces unless otherwise indicated.

a. Colors: As selected by Architect from manufacturer's full range.

b. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

D. Concealed Materials:

1. Plastic Laminate: Type BKL.

2. Particleboard.

3. MDF.

4. Hardboard.

2.4 PLASTIC-LAMINATE CABINET MATERIALS

A. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.

B. MDF: ANSI A208.2, Grade 130.

C. Particleboard: ANSI A208.1, Grade M-2.

D. Hardboard: ANSI A135.4, Class 1 Tempered.

E. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

- F. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.
- G. Edgbanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 3 mm thick at doors and drawer fronts, 1 mm thick elsewhere.
 - 1. Colors: As selected by Architect from manufacturer's full range.
- H. Edgbanding for Thermoset Decorative Panels: PVC or polyester edgbanding matching thermoset decorative panels.

2.5 COUNTERTOP AND SINK MATERIALS

- A. Adhesive for Bonding Plastic Laminate:
- B. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Durcon, Inc.
 - b. Prime Industries, Inc.
 - c. Thermo Fisher Scientific.
 - 2. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi/70 MPa.
 - b. Modulus of Elasticity: Not less than 2,000,000 psi/1400 MPa.
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 deg F/127 deg C.
 - 3. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
 - b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
 - 4. Color: Black.

2.6 FABRICATION

- A. Construction: Provide plastic-laminate laboratory casework of the following minimum construction:
1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch-19-mm- thick particleboard.
 2. Exposed Backs of Cabinets: 1/2-inch- 12.7-mm- thick particleboard or MDF.
 3. Backs of Cabinets: 1/4-inch 6.4-mm hardboard dadoed into sides, bottoms, and tops where not exposed, unless otherwise indicated.
 4. Drawer Fronts: 3/4-inch- 19-mm- thick particleboard.
 5. Drawer Sides and Backs: 1/2-inch 12.7-mm solid-wood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
 6. Drawer Bottoms: 1/4-inch 6.4-mm hardwood plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch 12.7-mm material for drawers more than 24 inches 600 mm wide.
 7. Doors: 3/4 inch 19 mm thick, with particleboard or MDF cores.
- B. Removable Backs: Provide backs that can be removed from within cabinets at utility spaces.
- C. Filler and Closure Panels: Provide where indicated and as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.
1. Provide knee-space panels (modesty panels) at spaces between base cabinets, where cabinets are not installed against a wall or where space is not otherwise closed.
 2. Provide utility-space closure panels at spaces between base cabinets where utility space would otherwise be exposed, including spaces below countertops.
 3. Provide closure panels at ends of utility spaces where utility space would otherwise be exposed.

2.7 HARDWARE

- A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.
- B. Butt Hinges: Brushed chrome satin, five-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide two for doors 48 inches 1200 mm high or less and three for doors more than 48 inches 1200 mm high.
- C. Hinged Door and Drawer Pulls: Solid-aluminum, stainless-steel, or chrome-plated-brass back-mounted pulls. Provide two pulls for drawers more than 24 inches 600 mm wide.
- D. Sliding Door Pulls: Stainless-steel or chrome-plated recessed flush pulls.
- E. Door Catches: Nylon-roller spring catches. Provide two catches on doors more than 48 inches 1200 mm high.

- F. Drawer Slides: Side mounted, epoxy-coated steel, self-closing; designed to prevent rebound when drawers are closed; complying with BHMA A156.9, Type B05091.
- G. Locks: Cam type with five-pin tumbler, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281 or Type E07261.
 - 1. Provide a minimum of two keys per lock and two master keys.
 - 2. Provide on all upper cabinets as noted on the Drawings.
 - 3. Master Key System: Key all locks to be operable by master key.
- H. Adjustable Shelf Supports: Powder-coated steel shelf rests complying with BHMA A156.9, Type B04013.

2.8 EPOXY COUNTERTOPS AND SINKS

- A. Countertops, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch 25 mm, with continuous drip groove on underside 1/2 inch 13 mm from edge.
- B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
 - 1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2DN 40, unless otherwise indicated.
 - 2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches 50 mm less than sink depth. Provide in same material as strainer.
- C. Epoxy Countertops and Sinks:
 - 1. Countertop Fabrication: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and butt joints assembled with epoxy adhesive and concealed metal splines.
 - a. Countertop Configuration: Flat, 1 inch 25 mm thick, with rounded edge and corners, and with drip groove and applied backsplash.
 - b. Countertop Construction: Uniform throughout full thickness.
 - 2. Sink Fabrication: Molded in one piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch 13-mm minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.
 - b. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.
 - c. Provide manufacturer's recommended adjustable support system for table- and cabinet-type installations.

2.9 LABORATORY ACCESSORIES

- A. Upright Rod Assembly and Metal Crossbar: Aluminum or stainless steel. Two vertical rods and one horizontal crossbar, 3/4 inch 19 mm in diameter and 36 inches 900 mm long unless otherwise indicated; two flush socket receptacles and two crossbar clamps. Ends of vertical rods are tapered to fit receptacles; all other rod ends are rounded.
- B. Pegboards: Polypropylene, epoxy, or phenolic-composite pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.
- C. Goggle Cabinets: Ultraviolet sterilization, 35 0 40 goggle capacity, white baked enamel on heavy-gauge steel, reflective interior, 110V-120V with 6 foot minimum cord, 15 minute timer, two safety door switches operates unit only when doors are closed and latched, with key lock.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
 - a. Carolina Biological Supply Company.
 - b. Flinn Scientific, Inc.
 - c. Sargent Welch.
- D. Demonstration Mirror

2.10 WATER AND LABORATORY GAS SERVICE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Broen Inc.; Distributed by Laboratory Enterprises, a Watts Water Technologies company.
 - 2. Chicago Faucets; a Geberit company.
 - 3. WaterSaver Faucet Company.
- B. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures - Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
 - 1. Provide units that comply with "Vandal-Resistant Faucets and Fixtures" recommendations in SEFA 7.
- C. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
 - 1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
- D. Finish: Chromium plated.

- E. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig/550 kPa.
 - 1. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
 - 2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
 - 3. Self-Closing Valves: Provide self-closing valves where indicated.
- F. Ball Valves: Chrome-plated ball and PTFE seals. Handle requires no more than 5 lbf/22 N to operate. Provide units designed for working pressure up to 75 psig/520 kPa, with serrated outlets.
- G. Needle Valves: Provide units with renewable, self-centering, floating cones and renewable seats of stainless steel or Monel metal, with removable serrated outlets.
- H. Hand of Fittings: Furnish right-hand fittings unless designation is followed by "L".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

- A. Comply with installation requirements in SEFA 2.3. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical. Do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch/1.5 mm in 3 m.
 - 2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch/3 mm in 3 m.
 - 3. Variation of Faces of Cabinets from a True Plane: 1/8 inch/3 mm in 3 m.
 - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch/0.8 mm.
 - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch/1.5 mm.
- B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.
- C. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches/400 mm o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.

1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches 600 mm o.c. and at sides of cabinets with not less than two fasteners per side.
- D. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 16 inches 400 mm o.c.
- E. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- F. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

- A. Comply with installation requirements in SEFA 2.3. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where indicated on Shop Drawings.
- B. Field Jointing: Where possible, make in same manner as shop-made joints, using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.
 1. Use concealed clamping devices for field-made joints in plastic-laminate countertops. Locate clamping devices within 6 inches 150 mm of front and back edges and at intervals not exceeding 24 inches 600 mm. Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints.
- C. Fastening:
 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches 1200 mm o.c.
 3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch 3 mm, and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
- D. Provide required holes and cutouts for service fittings.
- E. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.
- F. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.

- G. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

- A. Comply with installation requirements in SEFA 2.3.
- B. Drop-in Installation of Epoxy Sinks: Rout groove in countertop to receive sink rim if not shop prepared. Set sink in adhesive and fill remainder of groove with sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers. Remove excess adhesive and sealant while still wet and finish joint for neat appearance.

3.5 INSTALLATION OF LABORATORY ACCESSORIES

- A. Install accessories according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions.
- B. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.

3.6 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.
- B. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

3.7 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil 0.15-mm plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches 1200 mm o.c.

3.8 SERVICE-FITTING SCHEDULE

- A. Laboratory Gas Service Fitting GT:
 - 1. Service: Gas (fuel gas).
 - 2. Fitting Type: Turret.
 - 3. Outlets: As indicated on Drawings.

4. Outlet Type: Straight.
5. Valve Type: Ground-key cock.

END OF SECTION 123553.16

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS AND WINDOWSILLS

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 countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material apron fronts.
5. Solid surface windowsills.
6. Solid surface locker surrounds.

- B. Product Data: For countertop and windowsill materials.

- C. Shop Drawings: For countertops and windowsills. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

- D. Samples for Verification: For the following products:

1. Countertop and windowsill material, 6 inches (150 mm) square.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material countertops and windowsills 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.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops and windowsills similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of countertops and windowsills.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops and windowsills by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.7 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP AND WINDOWSILL MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Avonite
 - b. Corian.
 - c. Heartland Solid Surface.
 - d. Wilsonart International Holdings, Inc.
 - 2. Colors and Patterns: As indicated by manufacturer's designations.
 - a. SS-1 and SS-2: As indicated on Finish Schedule

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops and windowsills according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 - 1. Grade: Custom.
- B. Configuration:

1. Front: Straight, slightly eased at top.
 2. Backsplash: Straight, slightly eased at corner.
 3. End Splash: Matching backsplash.
- C. Countertops: 1/2-inch- (12.7-mm-) thick, solid surface material.
- D. Backsplashes: 1/2-inch- 12.7-mm-) thick, solid surface material.
- E. Fabricate tops with shop-applied edges and backsplashes unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
1. Fabricate with loose backsplashes for field assembly.
- F. Joints: Fabricate countertops without joints.
- G. Joints: Fabricate countertops in sections for joining in field.
1. Joint Locations: Not within 18 inches 450 mm of a sink or cooktop and not where a countertop section less than 36 inches 900 mm long would result, unless unavoidable.
 2. Splined Joints: Accurately cut kerfs in edges at joints for insertion of metal splines to maintain alignment of surfaces at joints. Make width of cuts slightly more than thickness of splines to provide snug fit. Provide at least three splines in each joint.
- H. Cutouts and Holes:
1. Outlets at Backsplashes:
 - a. Prepare countertops in shop for field cutting openings for electrical outlets in backsplashes. Make cutouts to accurately fit items to be installed an at right angles to finished surfaces.
 2. Counter-Mounted Cooktops: Prepare countertops in shop for field cutting openings for cooktops. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

2.3 WINDOWSILL FABRICATION

- A. Solid surface material sills.
1. Configuration: Provide sills with the following front style:
 - a. Front: Straight, slightly eased at top, 1/2-inch apron.
 2. Sills: 1/2-inch- (12.7-mm-) thick, solid surface material with front edge built up with same material.

3. Fabrication: Fabricate tops 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

2.4 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops and Windowsills: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4 inch (6 mm) maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Pre-drill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
 2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- G. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- H. Install sills level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).
1. Adhere solid surface sills to substrates with adhesive as approved by manufacturer.
- I. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- J. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16

SECTION 126600 - TELESCOPING STANDS

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. This Section includes the following:
 - 1. Wall-attached telescoping stands.
- B. Related Requirements:
 - 1. Division 26 and 27 sections for electrical power and communication systems installed in telescoping stands.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance Characteristics: Engineer, fabricate, and install telescoping stands to withstand the design loads specified in NFPA 102, "Standard for Assembly Seating, Tents, and Membrane Structures," Chapter 5, "Folding and Telescopic Seating," without exceeding the allowable design working stresses of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each telescoping stand unit.

1.4 SUBMITTALS

- A. Submit each item in this Article according to the Conditions of the Contract and Division 01 Specification Sections.
- B. Product Data for each type of telescoping stand specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of telescoping stands including plans, elevations, sections, details of components, and attachments to other units of Work.
 - 1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

- D. Wiring diagrams from manufacturer for electrically operated units.
- E. Samples for verification of the following items, in the size indicated below. Prepare Samples from the same material to be used for the Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- F. Maintenance data for telescoping stands, including detailed instructions for operation and annual inspection requirements of authorities having jurisdiction, to include in the operation and maintenance manual specified in Division 01.

1.5 QUALITY ASSURANCE

- A. NFPA Standard: Comply with requirements of NFPA 102, "Standard for Assembly Seating, Tents, and Membrane Structures," Chapter 5, "Folding and Telescopic Seating," except where more stringent requirements are indicated or imposed by authorities having jurisdiction.
- B. Installer Qualifications: Engage an experienced Installer to perform work of this Section who has specialized in installing types of telescoping stands similar to those required for this Project and who is acceptable to, or certified by, manufacturer of telescoping stands.
- C. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of telescoping stands that are similar to that indicated for this Project in material, design, and extent.
- D. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel" and AWS D1.3 "Structural Welding Code--Sheet Steel."
 - 1. Engage certified welders that have satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, have undergone recertification.
- E. Engineering Responsibility: Engineer telescoping stands by qualified professional engineer legally authorized to practice in jurisdiction where Project is located.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Check actual dimensions of construction affecting telescoping stands by accurate field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Where field measurements cannot be made without delaying the Work, guarantee dimensions. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Hussey Seating Co.
 2. Interkal Inc.
 3. Irwin Seating Company; Folding Bleacher Company Subsidiary.
 4. Universal; Interkal, Inc.

2.2 MATERIALS

- A. Panelam Deck: Provide manufacturer's standard polyethylene panelam deck.
1. Color: Gray.
- B. Structural Steel Shapes, Plates, and Bars: ASTM A 36 (ASTM A 36M), except where higher strength steel is indicated or standard with manufacturer.
- C. Commercial-Quality Uncoated Steel Sheet: ASTM A 366 (ASTM A 366M) cold-rolled steel sheet, or ASTM A 569 (ASTM A 569M) hot-rolled steel sheet, stretcher leveled.
- D. Structural-Quality Uncoated Steel Sheet: ASTM A 570 (ASTM A 570M) hot-rolled steel sheet, or ASTM A 611 cold-rolled steel sheet, stretcher leveled.
- E. High-Strength Uncoated Steel Sheet: ASTM A 607 hot- or cold-rolled steel sheet, stretcher leveled.
- F. Galvanized Steel Sheet: ASTM A 653, G60 (ASTM A 653M, Z180) coating designation, phosphatized, stretcher leveled.
- G. Steel Tubing: ASTM A 500, cold formed; or ASTM A 501, hot formed.
- H. Polyethylene Plastic Seats ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation.
- I. Fasteners: Vibration proof, of size and material standard with manufacturer.

2.3 COMPONENTS

- A. Provide manufacturer's standard telescoping stands fabricated to comply with requirements indicated. Smoothly round corners, edges, and exposed fasteners to eliminate snagging and pinching hazards. Form exposed sheet metal with flat, flush surfaces, true to line and level,

and without cracking and grain separation. Perform welding by operators and processes complying with AWS requirements.

- B. Bench Seats and Skirts: Provide seats with uniform heights of not less than 16 inches (406.4 mm) or more than 18 inches (457.2 mm), as standard with manufacturer.
- C. Sculptured Seat Modules and Skirts: Provide sculptured seat modules with uniform heights of not less than 16 inches (406.4 mm) or more than 18 inches (457.2 mm), as standard with manufacturer. Provide 18-inch wide individual seating modules constructed of high-density polyethylene structural foam. Each module shall have two longitudinal and five transverse internal ribs to provide additional structural integrity and resistance to impact. Each module shall have a full 1" interlock to the adjacent module both around the perimeter and along the internal ribs to eliminate pinching hazards and assure proper alignment. A steel-to-steel attachment of each module to a minimum 14 gage galvanized steel nose beam shall be provided for maximum rigidity. All such mounting hardware shall be concealed. End caps shall be provided at the ends of each bank of seating as well as at each aisle. Each module shall have a recessed area for seat numbering and shall include the numbering, unless noted otherwise.
 - 1. Material: Polyethylene plastic in color as selected by the Architect from manufacturer's full range of colors.
 - a. Allow for several colors arranged in a pattern determined by Architect.
 - 2. Profile: Contoured seat surface with enclosed back, cantilevered to the rear to provide toe space beneath seat.
 - 3. Depth: 10 inches (254 mm).
- D. Cutouts for wheelchair accessible seating at first tier locations indicated. Provide front removable rails attached to front of second tier at rear of wheelchair accessible seating area. Provide full-width front closure panel at cutout that matches decking construction and finish and extends from underside of second tier to 1-1/2 inches (38.1 mm) from finished floor.
- E. Risers: Fabricate risers from steel sheet with painted or galvanized finish, as standard with manufacturer.
- F. Footrests: Fabricate fully closed footrests from panelam plywood, as standard with manufacturer.
- G. Understructure: Fabricate understructure from structural steel members of size, spacing, and form required to support design loads.
 - 1. Cantilever bench seat supports to produce toe space uninterrupted by vertical bracing.
- H. Support Column Wheels: Provide manufacturer's nonmarring, soft, rubber-face wheel assembly under each support column. Include wheels of size, number, and design required to support stands and to achieve smooth operation without damage to flooring surface, but not less than 4 per column or less than 3-1/2 inches (88.9 mm) in diameter and 1 inch (25.4 mm) wide.

- I. Aisles: Fabricate stands with the following aisle configuration, at locations and of widths indicated:
 - 1. Footrest-Level Configuration: Interrupt seats to provide aisle walking surfaces at footrest level.
 - a. Provide manufacturer's standard automatic aisle closures to produce flush vertical face at aisles when system is stored.
- J. Row Spacing: Fabricate units with row spacing of 24 inches (609.6 mm), unless otherwise indicated.
- K. Row Rise: Fabricate units with row rise of between 10 inches (254 mm), as standard with manufacturer.
- L. Operation: Provide telescoping stands incorporating manufacturer's standard system of seating and understructure members that permit opening and closing of adjacent rows, allow individual and collective rows to be locked open for use, and close with vertical faces of upper skirts in the same vertical plane. The system shall also have an intermediate stop position to accommodate the cross-court volleyball court lines as indicated on the Drawings.
 - 1. Tractive Electric Operation: Provide manufacturer's standard integral power operation of telescoping stands by a series of electric-motor-driven units mounted under first rows that apply tractive force to floor. Provide units with rubber rollers or tracks that will not mar or damage floor over which stands move. Control units by plug-in, walk-along pendant switch, as standard with manufacturer.
 - a. Limit Switches: Provide open, closed and an intermediate stop limit switches that automatically stop the integral power system when telescoping stands reach the intermediate, fully opened or closed positions.
 - b. Motion Monitor: Provide flashing light with self-contained warning horn, rated at 85 decibels (dB) at 10 feet (3 m), mounted under telescoping seating for audio and visual warning during integral power operation.
 - c. Provide transformer, if required, to coordinate current characteristics of motor and control station with building electrical system.
- M. Types of Telescoping Stands: Provide assemblies of the following types, fabricated in lengths and number of rows indicated:
 - 1. Wall-Attached Type: Construct stands to provide for permanent attachment of rear of understructure to wall construction.
- N. Accessories: Provide the following accessories of manufacturer's standard design and construction at locations indicated or required to comply with referenced code standard:
 - 1. Nonslip abrasive tread nosings at vertical aisles.
 - 2. Intermediate aisle steps, fully enclosed, at each vertical aisle.

3. Removable front steps, fully enclosed, at each vertical aisle, that engage with front row to prevent accidental separation or movement and are equipped with a minimum of 4 nonskid feet.
 4. Removable aisle handrails located at centerline of each vertical aisle and discontinuous with gaps or breaks at intervals not exceeding 5 rows. Equip handrails with an intermediate horizontal handrail below the top rail.
 5. End railings of telescoping, self-storing type.
 6. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
 7. Gap fillers for closing openings between stand units or between stand units and adjoining construction.
 8. End panels covering exposed ends of stands in stored position.
 9. Safety End Closures: Provide self-storing safety end closures which are permanently attached to each end of a bank of seating so as to prevent unauthorized access to the area located directly beneath it. Closures shall be constructed from a heavy-duty vinyl coated polyester fabric and attached in a manner such that the closure is taut in the open position and folds in a self-storing manner when the bank is closed.
 10. Removable scorer's table that attaches to mounting sockets provided as part of telescoping stands.
 11. L-Bracket supports for supporting the top stack row from sagging when bleachers are in the intermediate position during volleyball games.
- O. Power Connection: System shall accept one 208-volt, three phase, three wire, 15 amp feed per section of stands as indicated on Drawings. Manufacturer's system shall include distribution of power from this point to individual motors and controls. Manufacturer's system shall include local power disconnect.
- P. Electrical Boxes: Provide cutouts for recessed electrical boxes in center/front of lowest riser.

2.4 STEEL FINISHES

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel complying with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Rust-Inhibitive Finish: Immediately after cleaning and pretreating, apply manufacturer's standard rust-inhibitive finish to exposed and concealed metal surfaces including understructure, except where other types of finishes are indicated.
 1. Epoxy Finish: Epoxy-resin-based finish consisting of prime coat and topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where telescoping stands are to be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of telescoping stands. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install telescoping stands to comply with manufacturer's instructions and Shop Drawings. Provide accessories indicated and anchors, fasteners, inserts, and other items required for installing and attaching units to adjoining construction.

3.3 ADJUSTING AND CLEANING

- A. On completion of installation, including work of other trades, lubricate, test, and adjust each telescoping stand unit to operate easily and to comply with manufacturer's specifications.
- B. Clean installed telescoping stands on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to demonstrate and train Owner's maintenance personnel as specified below.
 - 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 2. Train Owner's maintenance personnel on procedures and schedules related to operation, troubleshooting, servicing, inspection, and maintenance.
 - 3. Review data in the operation and maintenance manuals.
 - 4. Schedule training with Owner, through Architect-Engineer, with at least 7 days' advance notice.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure telescoping stands are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 12660

TELESCOPING STANDS

126600 - 7

SECTION 126900 – BLEACHERS AND GRANDSTANDS

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 RELATED SECTIONS

- A. Related Sections include the following:
 - 1. Section 003132 “Geotechnical Data.”
 - 2. Section 003132A “Geotechnical Report.”
 - 3. Section 033000 “Cast-in-Place Concrete” for concrete piers and footings and for installation of anchor bolts cast in concrete.
 - 4. Section 321313 “Concrete Pavement” for slabs and walkways.
 - 5. Division 26 Electrical Sections for electrical requirements.

1.3 SUMMARY

- A. Section Includes: Football/Track Grandstand and Baseball/Softball Grandstands.
 - 1. Provide and install pre-engineered steel structures, concrete piers and footings, and aluminum bleacher systems as shown on the Drawings with delegated design sealed by a professional engineer in the state of Kansas.
 - a. A geotechnical report was performed for this project; see Section 003132 “Geotechnical Data.”
 - 2. Minimum acceptable criteria:
 - a. Design per plan view and sectional view drawings.
 - b. All structural steel must be manufactured by an AISC certified structural steel manufacturer.
 - c. Welded Decking System as defined by ANSI/NFSI B101.1 and ANSI/NFSI B101.3 meeting the wet coefficient of friction (COF) of .6 on all walking surfaces. If media blasting is used to obtain the necessary wet (COF) of .6, those surfaces shall be anodized. Interlocking decking systems are not an acceptable equal on this project.
 - d. All steel to be hot-dipped galvanized after fabrication.

- e. Provide clear anodized aluminum front enclosure panel to within 2 inches of grade at the front of each grandstand. Football grandstand to have clear anodized aluminum finish for front closure panel.
- f. Concrete foundations will be designed by the grandstand manufacturer's engineer based on loads and foundation support reactions provided by grandstand manufacturers and geotechnical report. Grandstand foundations are to be included in this scope of work and shall be installed by a manufacture certified concrete installer with a minimum of 10 years' experience in grandstand foundations.
- g. The overall length of grandstand shall be as per architectural drawings.
- h. The number of rows shall be per Drawings.
- i. Height of front cross aisle from grade shall be per Drawings.
- j. Width of front walkway to be per Drawings
- k. The rise per row shall be per Drawings.
- l. The depth per row shall be per Drawings.
- m. Net seating capacity shall be per Drawings.
- n. ADA seating shall be as shown on Drawings.
- o. The riser shall be structurally connected to the decking system panel every 12 inches longitudinal with 1/4-inch diameter structural grade rivet. Tek screws are prohibited.
- p. One-piece risers shall interlock to row above and overlap the rear tread of row below forming the required overlapping and interlocking riser system. Two piece and or wedged in risers are prohibited.
- q. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments. Open portions of the bolt runner are prohibited.
- r. Aluminum extrusions using alloy 6063-T6 and 6061-T6.
- s. Understructure framing consist of:
 - 1) Football Grandstands: Galvanized structural steel square tube columns, supports and stringers that form a clear span design per drawings.
 - 2) Softball and Baseball Bleachers: Aluminum square tube and angle frame understructure consisting of 2-inch-by-2-inch-by-1/8-inch minimum size vertical support frames and 2-inch-by-1.5-inch-by-3/16-inch horizontal frames. Sway bracing to be 1.5-inch-by-1/5-inch-by-3/16-inch aluminum angle. Frames at 6'-0" maximum on center.
- t. All welded connections shall be by certified steel and aluminum welders and inspected at the manufacturer by a licensed CWI.
- u. Aisle and egress stairs shall have a 1/2-inch overlap.
- v. At locations where platforms meet end to end a beveled 4-inch wide aluminum threshold shall be provided to cover the walking surface. Thresholds also required where home side grandstand aisles abut the concrete concourse level.
- w. Seat support system for grandstands shall be:
 - 1) Universally adjustable L-Brackets seat supports to any location on the vertical plane of the decking system and shall be no greater than 4'-6" spacing. There shall be no through-bolting of these items.

- x. All L-shaped seat supports, aisle step supports, aisle handrails and risers shall be installed from the topside of the decking system for home stands. There shall be no through-bolting of these items through the riser system.
 - y. Guardrail system shall consist of galvanized chain link fence system.
3. Grandstand manufacture must have a written quality control program for manufacturing, shipping and installation.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Seatboard.
2. Fully integrated decking system showing welded treads with high traction finish.
3. Riser board with interlocking and overlapping system with structural support channel mounting system for future “flip-up” chairs.
4. Structural rivet connectors for overlapping riser system.
5. Handrail support post end cap.
6. 12-inch-by-12-inch chain link.
7. Deck attachment support member.
8. Welded deck members with internal splice/expansion sleeve.
9. Intermediate step.
10. Seat mounting bracket: L type.
11. Bleacher front closure panel system.

C. Delegated Design: Design of grandstand system including concrete footings, piers, substructure post and frame system, bracing, handrails and guardrails, aluminum seating and footboards including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1. Seating plan indicating aisles, walkways, seating sections and exits and exit calculations based on egress calculation as referenced in the applicable building codes.
2. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following grandstand system components as follows:
 - a. Foundations: Slabs, footings, foundations, reinforcement and anchor bolt setting plan.
 - b. Structural framing: All structural framing members shall have a permanent piece mark that shall correspond to the shop drawings and bill of material.
 - c. Primary and secondary framing: including but not limited to columns, beams, stringers, bracing, and connecting hardware.
 - d. Welded Decking System: including, but not limited to: decking platforms, risers, supports for seats, aisle steps, aisle handrails, egress stairs, hardware, seating, guardrails, and ramps.

- e. Refer to Civil Drawings for concrete slab thickness, grading, and slab reinforcing for attachment of ballfield bleacher systems.

- D. Structural Calculations: Sealed by a Professional Engineer licensed to practice engineering in the State of Missouri.

1.5 SITE VISITATION

- A. The manufacturer's representative shall revisit the site within six months after completion of the grandstand for inspection with the Owner.

1.6 PERFORMANCE REQUIREMENTS

- A. Bleacher Design Standard:

- 1. ICC/ANSI 300-2017.

- B. Structural Performance:

- 1. IBC 2015.
- 2. AISC Manual of Steel Construction.
- 3. ACI Building Code for Reinforced Concrete.
- 4. Aluminum Association of America.

- C. Federal Specifications LP-390C, Type 1, Class M, Grade 2, Category 3.

- D. Design loads must be as indicated and/or comply with minimum building code requirements:

Dead Load	6 psf	Set and footboards, risers, steel framing, etc.
Live Load	100 psf	To structural members. All stringers and girders shall be limited to L/200 for maximum vertical live load deflection.
	120 psf	Seatboards over a 6-foot span, multi-span condition.
	140 psf	Footboards (individually) over a 6-foot span.
Wind	30 psf	On projected vertical surface (as required by local code)
Sway	24 plf	Per lineal foot of seat, parallel to seat run.
Sway	10 plf	Per lineal foot of seat.

- E. General: The structure shall be braced for wind and construction loads until all structural elements are secured. Lateral and longitudinal bays shall be cross-braced as required. Guardrails shall be of adequate size, location and height and designed to carry required loads in accordance with ASTM E 985. Stairs and aisles shall be completely closed, in the direction of travel and shall have a maximum riser of 8 inches and a minimum tread of 11 inches.

- F. Deflection: Structural elements shall be sized to limit the live load deflections to 1/200 of the span.

- G. Delegated Design: Design of grandstand system including concrete footings, piers, substructure post and frame system, bracing, handrails and guardrails, aluminum seating and footboards and including a comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.7 QUALITY ASSURANCE

- A. Manufacturer shall have a minimum of ten years' experience in fabrication and installation of aluminum bleachers and grandstand structures.
- B. Qualifications: A qualified firm that is approved, authorized, or licensed by bleacher system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's standard warranty.
 - 1. Concrete Installers Qualifications: An experienced installer who has completed concrete work similar in material, design and extent indicated for this project and whose work has resulted in construction of grandstands with a record of successful in-service performance. Concrete installer must be certified by grandstand manufacturer.
 - 2. Erector Qualifications: An experienced erector who has specialized in erecting and installing grandstands similar in material, design, to the extent indicated for this project and whose work has resulted in construction of grandstands with a record of successful in-service performance. Grandstand Erector must be certified by grandstand manufacturer.
- C. Quality Control: Manufacturer's written quality control for manufacturing, shipping and installation shall be submitted prior to award of contract.
- D. Standards and Guidelines: Comply with the provisions of the following codes, specifications and standards, latest editions, except as otherwise noted or specified:
 - 1. American Concrete Institute (ACI)
 - 2. American Institute of Steel Construction (AISC)
 - 3. American Welding Society (AWS)
 - 4. Americans with Disabilities Act (ADA)
 - 5. Underwriters Laboratory (UL)
 - 6. National Electrical Code (NEC)
 - 7. International Building Code (IBC)
 - 8. International Code Council 300 (ICC 300-2012)

1.8 WARRANTY

- A. Grandstand shall be warranted for a period of one year after the date of Substantial Completion.
- B. Warranty shall include manufacturer's warranty to repair or replace components of the grandstand and bench seating and press box that fail in material or workmanship within the specified warranty period. Failures include, but are not limited to the following:

1. Structural failures, including excessive deflection.
2. Failure of system to meet performance requirements.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

C. Warranty for Metal Finishes: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements. Being listed as an acceptable manufacturer does not eliminate the requirement to meet all requirements of the specifications. Provide products by one of the following approved manufacturers:

1. Outdoor Aluminum, Inc. (Basis of Design).
2. Southern Bleacher Company, Inc.
3. Sturdisteel Company.

B. Structural Framing Members:

1. Structural-Steel Shapes: ASTM A992/A992M tensile yield strength, 345 MPa (Fy = 50 ksi); tensile ultimate strength, 450 MPa (Fu = 65 ksi)
2. Steel Plate, Bar or Strip: ASTM A 36/A 36M
3. Steel Tubing or Pipe: ASTM A 500, Grade B
4. Bolts, Nuts and Washers: ASTM A 307 A (ASTM A307) hex carbon and alloy steel bolts, nuts, and washers.
5. Anchor Rods, Bolts, Nuts and Washers: As follows:
6. Headed Bolts: ASTM A 307, Grade A carbon –steel, hex-head bolts; and carbon-steel nuts.
7. Finish: Minimum 2 oz. hot dipped galvanized in accordance with ASTM 123-A with minimum thickness of 3.3 mils.
8. Horizontal Beams: Horizontal beams shall be wide flange units, supported on columns as required to transfer stadium loads to foundations.
9. Vertical Columns: Columns shall be of structural square tube. Use of wide flange beams for columns is prohibited.
10. Bracing: All transverse bays shall be free of cross bracing. Longitudinal bays shall be braced in alternate bays where possible. All bracing shall be 7/8" rod and shall be double-nutted at connection points through the columns.
11. Stringers: Stringers shall be wide flange material with welded angle riser and tread supports.

C. Decking System Platforms:

1. Decking system platforms shall be an all-aluminum extruded system attached to the understructure by means of concealed aluminum clips, galvanized bolts, washers and nuts. The rear portion of the platform will turn ninety degrees vertical to accept the next row of decking platforms. The front portion of the platform shall be complete with a

female front edge to allow for a positive male/female connection of a vertical riser. Individual aluminum components shall be joined by means of the metal inert gas process. The attachment of the riser to the platforms shall form a structurally integrated system.

2. Individual platforms shall be tread depth x 37'-6" maximum length with the actual length designed to create the minimum number of expansion seams.
3. Platform shall have a minimum aluminum wall thickness of 0.078-inch and aluminum shall be alloy 6063-T6.
4. The platforms for shall have integral bolt runners to allow for the attachment of seat supports, aisle steps and aisle handrails to be made without penetrating the decking system. Through bolting is prohibited. After installation of the above components, there shall be a full closure of the bolt runner using an aluminum cover strip. Open portions of the bolt runner are prohibited.
5. Deck shall allow for reconfiguration of seating and aisles without alteration of the understructure.
6. At locations where platforms meet end to end a four-inch wide aluminum threshold shall be provided to cover the walking surface. Threshold shall be beveled on both sides so as not to create a trip hazard and must have a fluted surface to prevent slipping. Threshold shall be integrated with front and rear covers for the platforms that conceal transition from the horizontal to the vertical portions of the deck. Threshold must comply with specified deflection criteria and once installed must allow for expansion and contraction.

D. Decking System Riser:

1. The decking system riser at aisles shall be extruded aluminum; alloy 6063-T6.
2. This extrusion shall have a male ridge running continuous at the upper leading edge to interlock with the front portion of the decking system panel.
3. The riser shall be structurally connected to the decking system panel every 12 inches longitudinal with 1/4-inch diameter structural grade rivet.
4. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments.

E. Decking System Seat Supports:

1. The decking system seat support shall be of extruded aluminum angle (to be verified prior to bid) 2-1/2-inch-by-2-inch-by-3/16-inch, alloy 6061 T6, mill finish.
2. Once installed the seat support shall have no noticeable gaps between the decking system riser and support.
3. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system to allow Owner future expansion of flip-up chair seats.
 - a. L-Shaped supports shall be used on all grandstands.

F. Decking System Aisle Handrails:

1. The decking system aisle handrails shall be 1-5/8-inch Schedule 40 anodized aluminum pipe and riser mounted. Flange deck mounted is unacceptable.
2. Handrails shall have a center line handrail and the spacing between rails shall not be less than 22 inches or more than 36 inches. Handrails shall be discontinuous and shall not span more than five rows of seating.

G. Egress Stairs:

1. The decking system egress stair stringers are to be constructed of 8-inch aluminum channel, alloy 6061-T6. Tread supports to be welded to 8-inch member to totally cap the end of the 2-inch-by-12-inch stair tread against the channel web.
2. Walking surface of tread shall be complete with female front edge to allow for positive male/female connection of the riser closure. All risers shall be powder coated and fastened to the rear tail of the stair tread with 1/4-inch diameter structural grade aluminum rivets.
3. Stair treads nosing to be anodized black. Nosing shall have no external fasteners. The leading edge of the step tread shall project
4. 1/2-inch beyond the front of the vertical riser.
5. Stair grab rail to be constructed of 1-5/8-inch Schedule 40 anodized aluminum pipe with no fittings at transition from sloped system to grade.

H. Decking System Hardware:

1. All bolts, washers and nuts shall be galvanized.
2. End caps shall be of a heavy duty, clamping, aluminum channel design fastened to the ends of extrusions with aluminum rivets. End caps shall close all end openings of extrusions and shall be a full-length piece and match in both color and finish the extrusion to which they attach.
3. All riser fasteners shall be structural 1/4-inch diameter structural grade rivet.

I. Seating:

1. Seats shall be of extruded aluminum with a fluted non-skid surface, alloy 6063-T6, with 204R1 anodized clear finish.
2. Plank shall be 2-inch-by-10-inch nominal with a wall thickness of 0.078-inch (\pm 0.006-inch industry tolerance) at the smooth surface.
3. Finish size shall be 1-3/4-inch-by- 9-1/2-inch.
4. Seats shall attach to the decking system seat supports by means of concealed aluminum clips, galvanized bolts, washers and nuts.
5. Seat supports shall be installed on centers at no greater than 4'-6" on center.
6. End caps shall be of extruded aluminum and shall match in both color and finish the plank to which they attach. All end caps shall be single piece and shall attach to the underside of the plank with a minimum of two aluminum rivets.

2.2 CLOSED DECK SYSTEM

- A. Floor decks on grandstand shall be all-aluminum, welded, maintenance-free, corrosion-resistant, high traction decking system as defined by ANSI/NFSA B101.1 and B101.3. If media blasting is used to obtain the required coefficient of friction, those surfaces will be anodized. Decking system walking surface will be fluted, high traction and aesthetically pleasing without showing traffic pattern wear.

1. Gaps between the longitudinal portions of the decking will not be permitted.

2. Decking shall be of such rigidity and reinforcing that no “oil-canning” of welded decking material will occur. The tread surface shall consist of an enclosed aluminum welded deck, and designed in a way that all fasteners for treads are concealed.
 3. The decking extrusions shall be 6063-T6 aluminum alloy, mill finish with a wall thickness of 0.078 inch.
 4. The riser extrusions shall be 6063-T6 aluminum alloy, anodized finish with a wall thickness of 0.078 inch.
 5. The back portion of the tread shall be an extrusion design of such height as to create sufficient overlap with the riser plate for the attachment of connection hardware. The transition from vertical riser to horizontal tread shall be radiused to prevent trash accumulation.
 6. The decking system shall have integral bolt runners to allow for the attachments of seat supports, aisle steps, and aisle handrails to be made without penetrating the decking system. Through bolting is prohibited. Following installation of the above components, there shall be a full closure of the bolt runner using an aluminum cover strip. Open bolt runner channels are prohibited.
- B. The riser shall be of sufficient overall height to adequately lap the vertical projection of the back lower tread extrusion. Riser shall both interlock to the row above and overlap the row below.
- C. The connecting hardware shall be concealed and attached by use of aluminum bolt clips with 5/16-inch hot-dipped galvanized bolts. Through bolting of decking material is not allowed. Riser lap shall be secured with 1/4-inch diameter; non-corrosive structural rivets every 12 inches on center horizontally.
- D. Adjacent deck panels at joints shall be aligned with internal sleeves extending 6 inches minimum into each panel. One side secured to deck bolted by a minimum of two rivets each.
- E. Joint covers shall be installed at panel joints and shall be attached to the internal sleeves with non-corrosive fasteners.
- F. Channel end caps shall be provided for decking system at each end of grandstand.

2.3 END CAPS

- A. Walkways, footboards, and aisle board end caps shall be one-piece mill finished aluminum channel design tumbled after fabrication to remove burrs and sharp edges. End caps shall be riveted to the underside of the planks.
- B. Seatboard end caps shall be one-piece anodized aluminum riveted to the underside of the planks.
- C. Handrail post tubes shall be covered with cast aluminum top caps.

2.4 ACCESSIBLE AREAS

1. Accessible seating shall be enclosed on all sides with guardrail. No exposed vertical risers shall be allowed in the handicapped area.
2. Accessible spaces shall have handicapped seating in pairs of two.
3. Accessible seating shall have adjacent companion seat.

2.5 BLEACHER CONFIGURATION

- A. Football: Provide a minimum of 15-rows.
- B. Ballfields: Provide 10-rows
- C. Overall length shall not exceed that indicated in the Drawings.
- D. Riser per row shall be 10-inch risers for Football and 14-inch for Ballfield grandstands.
- E. Depth per row shall be 26-inch depth.
- F. Seating capacity, based on 18-inches per seat, shall be:
 1. Football: 525 net seats minimum including ADA spaces.
 2. Ballfields: 160 net seats minimum including ADA spaces.
- G. Guardrail system at the sides and back of all grandstands shall consist of a two rail, black vinyl-coated chain link fence system and shall be 54-inches minimum height.
- H. Bleachers shall have 54-inch aisles in width with center aisle handrail system.
- I. Accessible seating section shall accommodate sufficient wheel chairs and companion seating to meet code requirements. Ballfield units shall include a single double notchout with ADA by owner elsewhere.

2.6 FRONT CLOSURE PANEL

- A. Product Description: Manufacturer's standard aluminum front closure panel for all grandstands. Provide panels to close-off field side of front walkway, stairs and ramps down to within 2-inches of finish grade or concrete paving.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where grandstands are to be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Field locate and mark existing utilities in the area of the grandstand to confirm no conflicts exist with proposed structure and footings and the existing utilities. Contractor will protect existing utility services and repair at no expense to the Owner if damaged.
- C. Before erection proceeds, certified grandstand installer will survey elevations and locations of concrete foundations or pads and anchor bolts to verify compliance with the requirements of grandstand manufacturers' tolerances.
- D. Erect grandstand system according to manufacturer's written instructions and erection drawings.
- E. Do not field cut, drill or alter structural members without written approval from grandstand system manufacturer's professional engineer.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install bleachers to comply with referenced safety standards and manufacturer's written instructions.

3.3 CLEANING

- A. Clean all surfaces after erection, in accordance with manufacturer's recommendations.
- B. Exercise care to avoid damage to protective coatings and finishes.
- C. Remove and properly dispose of all packaging and construction debris.

END OF SECTION 126900

SECTION 129300 - SITE FURNISHINGS

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. This Section includes the following:
 - 1. Trash receptacles.
 - 2. Bicycle racks.
- B. Related Sections include the following:
 - 1. Section 033000 "Cast-in-Place Concrete" for installation of pipe sleeves cast or formed voids in concrete footings.
 - 2. Section 312000 "Earth Moving" for excavation for installation of concrete footings.
- C. Products furnished, but not installed under this Section, include pipe sleeves to be cast in concrete footings.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For units with factory-applied color finishes.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Size: Not less than 6-inch- (152-mm-) long linear components and 4-inch- (102-mm-) square sheet components.
- D. Product Schedule: For site furnishings. Use same designations indicated on Drawings.
- E. Maintenance Data: For all site furnishings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of site furnishing(s) through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel and Iron: Free of surface blemishes and complying with the following:
1. Plates, Shapes, and Bars: ASTM A 36/A 36M.
 2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53, or electric-resistance-welded pipe complying with ASTM A 135.
 3. Tubing: Cold-formed steel tubing complying with ASTM A 500.
 4. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 1011/A 1011M and complying with dimensional tolerances in ASTM A 500; zinc coated internally and externally.
 5. Sheet: Commercial steel sheet complying with ASTM A 1011/A 1011M.
 6. Perforated Metal: From steel sheet not less than 0.0897-inch (2.3-mm) nominal thickness; manufacturer's standard perforation pattern.
 7. Expanded Metal: Carbon-steel sheets, deburred after expansion, and complying with ASTM F 1267.
 8. Malleable-Iron Castings: ASTM A 47/A 47M, grade as recommended by fabricator for type of use intended.
 9. Gray-Iron Castings: ASTM A 48/A 48M, Class 200.
- B. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials; commercial quality, tamperproof, vandal and theft resistant, concealed, recessed, and capped or plugged.
- C. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107; recommended in writing by manufacturer, for exterior applications.
- D. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound; resistant to erosion from water exposure without needing protection by a sealer or waterproof coating; recommended in writing by manufacturer, for exterior applications.
- E. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:
1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a

clear, polymer film. Internal, same as external or consisting of 81 percent zinc pigmented coating, not less than 0.3 mil (0.0076 mm) thick.

2. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.2 TRASH RECEPTACLES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Landscape Forms, Inc.; Plexus II 40-inch diameter, side opening receptacle, surface mount system with metal liner in powder coat color to match receptacle, or a comparable product by one of the following:
 1. BRP Enterprises, Inc.
 2. DuMor Inc.
 3. Fair Weather Site Furnishings.
 4. Forms + Surfaces.
 5. Urban Accessories, Inc.
- B. Steel Facing Surrounds: Evenly patterned, parallel flat steel straps, bars, or tubular shapes.
- C. Support Frames: Steel; welded wire mesh.
- D. Steel Finish: Manufacturer's standard powder coating system or approved equal.
 1. Color: "Silver", or as selected by Architect from manufacturer's full range.

2.3 BICYCLE RACKS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Landscape Brands Model "LBR9PSURF" bike rack, surface mount system with stainless steel concrete fasteners, 9-bike capacity, or a comparable product by one of the following:
 1. Forms+Surfaces
 2. Anova Furnishings
 3. Landscape Forms, Inc.
 4. Madrax.
 5. Thomas Steele
 6. Victor Stanley, Inc.
- B. Locations: As indicated on the Drawings.
- C. Frame: 1.5" o.d., 0.120" wall steel tubing minimum, with manufacturer's standard powder coat finish over hot-dipped galvanized steel. Surface mounting plate to be minimum ¼-inch thick and welded to the post. Provide and secure mounting plate covers over the plate and fastener system.
 1. Frame Height: 36-inches minimum above concrete substrate.
 2. Frame Length: 89-inches.

3. Useable Opening Width: 10-3/4-inches minimum.

- D. Bike Locking System: Allow for two bicycles to be secured to the rack parked parallel. Bicycles will be headed in the same direction. Provide two-point contact to prevent bicycle from tipping over.
- E. Finish/Color: Powder-Coated steel. Color: "Silver" as selected from manufacturer's full color range.

2.4 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.
- C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
- D. Exposed Surfaces: Polished, sanded, or otherwise finished; all surfaces smooth, free of burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.
- E. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 STEEL FINISHES

- A. Baked-Enamel, Powder-Coat Finish: Manufacturer's standard, baked, polyester, powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored to concrete surface with stainless steel concrete fasteners. Position in locations indicated on Drawings.

3.3 CLEANING

- A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair any damaged finishes to match original finish or replace component.

END OF SECTION 129300

SECTION 134800 – SOUND CONTROL ACCESS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide metal sound control door and frame assemblies where shown on the Drawings, as specified herein, and listed on the Door Schedule. The work includes door and frame assemblies complete with acoustical seals, cam-lift hinges, and all finish hardware factory supplied and installed. Door leaf and frame is factory assembled and shipped complete as one unit.
- B. Related Sections:
 - 1. Section 042000 “Unit Masonry.”
 - 2. Section 087100 “Door Hardware.”
 - 3. Section 088000 “Glazing.”
 - 4. Section 092216 “Non-Structural Metal Framing.”
 - 5. Section 092900 “Gypsum Board.”
 - 6. Section 099123 “Interior Painting.”

1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Sound Rating: Provide door and frame assemblies that have been fabricated as sound-retardant units, tested according to ASTM E 90 and have the following certified Sound Transmission Class (STC) rating as determined according to ASTM E 413.
 - 1. STC Rating 53

1.3 SUBMITTALS

- A. Comply with pertinent provisions of the Contract, Division 01 and Section 013300 “Submittal Procedures.”
- B. Product Data: Submit:
 - 1. Material lists of items provided under this Section.
 - 2. Manufacturer’s specifications and other data needed to prove compliance with the specified requirements.
 - 3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation and anchorage.
 - 4. Manufacturer’s recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

5. Test Reports from a qualified independent testing agency indicating and interpreting test results from Part 3 of this Section relative to compliance of sound ratings with the indicated requirements.
 6. Material certificates in lieu of laboratory test reports when permitted by Architect signed by the manufacturer certifying that each sound control door complies with the project requirements,
- C. Photographs and quality control inspection reports will be provided prior to shipment. Photograph including doors with all pertinent hardware installed and hanging, in the completed position. Door open and door closed photographs will be provided for each door.

1.4 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Acoustical Performance:
1. The acoustical door manufacturer will be required to submit acoustical performance data in the form of up-to-date test reports from an independent testing laboratory indicating the doors to be provided will have the required Sound Transmission Class Rating (ASTM E-90-90).
 2. For the required STC rating, refer to door schedule drawing.
 3. Owner may at his option order performance tests of installed door assemblies by an independent consultant to verify compliance with the specifications. Any discrepancies shall be repaired or replaced without cost to the Owner.
- C. Single-Source Responsibility: Provide sound control doors and frames, including gaskets, hinges and other hardware items essential for sound control as an assembly and by a single firm specializing in producing this type of work for a minimum of ten (10) years.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Use all means necessary to protect the materials of this section before, during and after installation and to protect the installed work and materials of all other trades.

1.6 WARRANTY

- A. Acoustic door materials and hardware shall be guaranteed against defective workmanship for one (1) year from date of shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide single and/or double leaf, “Noise Lock” acoustic door(s) and frame(s) with cam lift hinges and split frames as manufactured by IAC Acoustics, A Division of Sound Seal 401 Airport Road, North Aurora, IL 60542 630-270-1790. Equivalent products will be considered, when submitted for approval prior to the bid opening, and meet or exceed the requirements of this specification.
- B. Other approved manufacturers:
 - 1. Noise Barriers, LLC.

2.2 MANUFACTURED ASSEMBLIES (NOISE LOCK DOORS)

- A. Door leaf(s) minimum thickness:
 - 1. STC 47 through STC 53 Rating, 2-1/2 inches (64 mm)
 - 2. Door leaf(s) and door stiffeners are to be fabricated from 14 gauge (2 mm) cold rolled, galvanized steel with an A60 coating weight, and filled with 6 lb density, sound absorbing, and damping elements.
- B. Frame(s) shall be fabricated from 14 gauge cold rolled, galvanized steel with an A60 coating weight and furnished “split” in two (2) pieces, inside and outside, that are mitered and welded together allowing for easy installation into either existing or new construction openings.
- C. Acoustic Seals: Doorjamb, meeting stiles of double doors and at the head of the door and frame shall receive self-aligning magnetic, [fire resistant (if UL rated)] compression seals. Door(s) to be held in closed position by magnetic force of perimeter seals.
- D. Acoustic labyrinth shall be created when door is in closed position. Bottom of door leaf shall contain continuous, adjustable, gravity-activated seal that shall compress against the floor as the door is closed. Raised sills and threshold drop seals will not be acceptable.
 - 1. Acoustic Seal assemblies as follows:
 - a. STC 53 Rating, Double magnetic type
- E. Jamb anchors: Provide jamb anchors as determined by wall construction. Anchors are to be spaced at 12 inches (305 mm) on center (max) and are to be of a corrosion resistant material.
- F. Hardware:
 - 1. Hinges: IAC, cam-lift, butt-type, hinges, US26D finish (Hinge manufacturer to furnish laboratory test data certifying that hinges of identical design have been cycled a

minimum of 125,000 times while supporting a door leaf weighing a minimum of 350 lbs.)

a. Quantities of hinges as follows:

1) For door leaf thickness less than or equal to 2-1/2 inches:

- a) Two (2) hinges required per leaf for openings up to and including 96 inches (2438 mm) high
- b) Three (3) hinges required per leaf for openings up to and including 120 inches (3048 mm) high

2) For door leaf thickness greater than 2-1/2 inches:

- a) Three (3) hinges required per leaf for openings up to and including 96 inches (2438 mm) high
- b) Four (4) hinges required per leaf for openings up to and including 120 inches (3048 mm) high

2. Closers: LCN or Norton, factory installed.

- a. Pull Handles: 1-inch (25 mm) diameter by 9 inches (229 mm) overall length, 3-inch (76 mm) projection, US28 finish, factory installed.
- b. Push Plates: 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, US32D finish, factory installed.
- c. Latchsets/Locksets: Provided and installed by door manufacturer. Refer to Section 087100 "Door Hardware" for manufacturer, type and details.
- d. Exit Devices: Provided and installed by door manufacturer. Refer to finish hardware section for manufacturer, type and details.
- e. Coordinators: Dorma; (used on double leaf doors when both leaves need to be active). Factory installed.

G. Hardware Reinforcement

- 1. Hinges: Minimum of 1/4 inch (6 mm) thick by 2 inches (51 mm) wide by 7-1/2 inches (191 mm) lg.
- 2. Frames: Minimum of 3/16 inch (5 mm) thick for strikes and #11 (3 mm) gauge for closers.
- 3. Doors: Minimum of #11 (3 mm) gauge for lock boxes and closers.

H. Glazing

- 1. Non-Fire Rated: Provide factory-installed, aluminum extruded stops and moldings with true mitered corners for double, glazed assemblies. Size of vision lite is to be determined from the door schedule. Safety glass or fire-resistive glazing product meeting doors' sound control and labeling requirements is acceptable.

2.3 PRE-HUNG

- A. Assembly and adjustment of door leaf, frame, acoustic seals, hinges and associated finish hardware shall take place at the factory to insure ease of installation, reliable operation and acoustic performance. The entire manufactured assembly shall be shipped to the job site ready to install and operate.

2.4 FABRICATION

- A. General: Fabricate units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Wherever practical, fit and assemble units in the manufacturer's plant. Identify work that is not permanently factory-assembled before shipment to ensure proper assembly at the Project site. Weld exposed joints continuously: grind, fill dress and make smooth flush and invisible.

2.5 FINISHES (FACTORY)

- A. Doors and frames shall receive a shop coat of a rust-inhibitive primer. The primer shall be applied over properly prepared metal, in accordance with the manufacturer's standard shop prime coat procedure and oven-baked dry.
- B. Others will perform finish painting under the painting section 099123 "Interior Painting".

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.2 PREPARATION

- A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
- B. Adjacent Construction: Coordinate door assembly details with details of adjacent work to ensure proper attachments and clean junctions.

3.3 INSTALLATION

- A. Install work in accordance with reviewed shop drawings and these specifications using only factory-trained personnel as required by the Manufacturer and approved by the Architect.

1. Hang doors and adjust for free swinging operation without binding, sticking, sagging or excessive clearances.
2. During installation, solidly pack acoustic insulation around frames that are installed in stud and gypsum-wallboard partitions.
3. Caulk exterior joint prior to painting.
4. Install sound control door assemblies during finish phase of construction to protect units from damage.
5. When installation is otherwise complete, adjust operating hardware for proper operation and function.

3.4 FIELD QUALITY CONTROL

- A. Upon completion of this portion of work, and prior to its acceptance by the Owner, secure a visit to the job site by a qualified representative of the manufacturer of the acoustical door system(s) to confirm that installation is in conformance with the manufacturer's recommendations.

3.5 FIELD TESTING

- A. Testing Agency: Owner will employ and pay an independent testing agency to perform sound control field testing.
- B. Selection: Randomly selected by Owner, except not-completely installed sound doors.
- C. Testing Requirements: Conduct field tests according to ASTM E336 with results calculated according to ASTM E413 to confirm that the operating field NIC values are within 5 dB of laboratory STC values.
- D. Test results shall be reported promptly and in writing by testing agency to Owner, Contractor and Architect.
- E. Repair or replace components of sound control doors where test results indicate STC rating does not meet requirements.

3.6 DEMONSTRATION

- A. Instruct the Owner's maintenance personnel regarding operation and maintenance of all acoustic doors.

END OF SECTION 134800

SECTION 142123.16 – MACHINE ROOM-LESS ELECTRIC TRACTION PASSENGER ELEVATORS

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 machine-room-less electric traction passenger elevators.
- B. Related Requirements:
 - 1. Section 015000 "Temporary Facilities and Controls" for temporary use of elevators for construction purposes.
 - 2. Section 033000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
 - 3. Section 051200 "Structural Steel Framing" for the following:
 - a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
 - b. Hoist beams.
 - 4. Section 055000 "Metal Fabrications" for the following:
 - a. Pit ladders.

1.3 DEFINITIONS

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.
- B. Service Elevator: A passenger elevator that is also used to carry freight.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include capacities, sizes, performances, operations, safety features, finishes, and similar information.

2. Include Product Data for car enclosures, hoistway entrances, and operation, control, and signal systems.

B. Shop Drawings:

1. Include plans, elevations, sections, and large-scale details indicating service at each landing, coordination with building structure, relationships with other construction, and locations of equipment.
2. Include large-scale layout of car-control station and standby power operation control panel.
3. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

- C. Samples for Verification: For exposed car, hoistway door and frame, and signal equipment finishes; 3-inch- (75-mm-) square Samples of sheet materials; and 4-inch (100-mm) lengths of running trim members.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Seismic Qualification Certificates: For elevator equipment, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

- C. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway and pit layout and dimensions, as indicated on Drawings, and electrical service including standby power generator, as shown and specified, are adequate for elevator system being provided.

- D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

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

1. Submit manufacturer's or Installer's standard operation and maintenance manual, according to ASME A17.1/CSA B44 including diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.
- C. Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard one-year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

1.9 COORDINATION

- A. Coordinate installation of inserts, sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, inserts, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Coordinate locations and dimensions of work specified in other Sections that relates to electric traction elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways and pits.

1.10 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
 - 2. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide “MonoSpace 500 Gearless Traction Elevator” as manufactured by KONE, Inc. or an equivalent product by one of the following:
 - 1. Otis Elevator Company.
 - 2. Schindler Elevator Corp.
 - 3. Thyssenkrupp Elevator Corporation.
- B. Source Limitations: Obtain elevators from single manufacturer.
 - 1. Major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.
- B. Accessibility Requirements: Comply with requirements for accessible elevators in the United States Access Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

2.3 ELEVATORS

- A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturer's standard components shall be used, as included in standard elevator systems and as required for complete system.
- B. Elevator Description:
 - 1. Rated Load: 3,500 lb.
 - 2. Rated Speed: 150 fpm.
 - 3. Operation System: Simplex collective operation.
 - 4. Auxiliary Operations:
 - a. Standby power operation.
 - b. Standby-powered lowering.
 - c. Automatic dispatching of loaded car.
 - d. Nuisance-call cancel.
 - e. Loaded-car bypass.
 - 5. Security Features: Card-reader operation/keyswitch operation/keypad operation/car-to-lobby feature.
 - 6. Car Enclosures:

- a. Inside Width: Not less than 78 inches from side wall to side wall.
 - b. Inside Depth: Not less than 67 inches from back wall to front wall (return panels).
 - c. Inside Height: Not less than 90 inches to underside of ceiling.
 - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish.
 - e. Car Fixtures: Satin stainless steel, No. 4 finish.
 - f. Basis-of-Design: KONE Steel Cab Cool Vintage Standard - 42009
 - g. Side Wall Panels: Pearl Silver laminate.
 - h. Rear Wall Panels: Graphic Bamboo printed laminate.
 - i. Reveals: Black.
 - j. Door Faces (Interior): Satin stainless steel, No. 4 finish.
 - k. Door Sills: Aluminum.
 - l. Ceiling: Satin stainless steel, No. 4 finish: Rectangular LED light panel.
 - m. Handrails: 1/2 by 2 inches (13 by 50 mm) rectangular satin stainless steel, No. 4 finish, at sides of car.
 - n. Floor prepared to receive carpet as specified for adjacent Corridor.
 - o. Openings: Front.
 - p. Ventilation: Fan.
7. Hoistway Entrances:
- a. Clear Opening Width: 42 inches (1067 mm).
 - b. Clear Opening Height: 84 inches (2134 mm).
 - c. Type: Single-speed side sliding.
 - d. Frames: Satin stainless steel, No. 4 finish.
 - e. Doors: Satin stainless steel, No. 4 finish.
 - f. Sills at All Floors: Aluminum.
8. Hall Fixtures at All Floors: Satin stainless steel, No. 4 finish.
9. Additional Requirements:
- a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.
 - b. Provide hooks for protective pads in all cars and two complete set(s) of full-height protective pads.

2.4 TRACTION SYSTEMS

- A. Elevator Machines: Permanent magnet, variable-voltage, variable-frequency, ac-type hoisting machines and solid-state power converters.
1. Provide non-regenerative system.
 2. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
- B. Buffers, Car and Counterweight: Polyurethane buffer.
- C. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

- D. Machine Beams: Provide steel framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 051200 "Structural Steel Framing" for materials and fabrication.
- E. Car Frame and Platform: Bolted- or welded-steel units.
- F. Guides: Roller guides or polymer-coated, non-lubricated sliding guides. Provide guides at top and bottom of car and counterweight frames.

2.5 OPERATION SYSTEMS

- A. General: Provide manufacturer's standard microprocessor operation systems as required to provide type of operation indicated.
- B. Auxiliary Operations:
 - 1. Single-Car Battery-Powered Automatic Evacuation: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it moves to the next floor above or below, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
 - 2. Automatic Dispatching of Loaded Car: When carload exceeds 80 percent of rated capacity, doors begin closing.
 - 3. Nuisance-Call Cancel: When car calls exceed a preset number while carload is less than a predetermined weight, all car calls are canceled. Preset number of calls and predetermined weight can be adjusted.
 - 4. Loaded-Car Bypass: When carload exceeds 80 percent of rated capacity, car responds only to car calls, not to hall calls.
 - 5. Fire-Fighters' Emergency Operation: Elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1/CSA B44.
- C. Security features shall not affect emergency firefighters' service.
 - 1. Card-Reader Operation: System uses card readers at car-control stations to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. Provide stripe-swipe card reader integral with each car-control station.
 - a. Card reader shall be compatible with the building door security system specified in Section 087100 "Door Hardware".
 - 2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at hall push-button stations. Key is removable in either position.
 - 3. Keypad Operation: Allows each landing to be restricted or unrestricted. When a restricted landing button is pressed, a "Restricted Floor" lamp lights and remains lit until landing access code has been entered into a keypad or predetermined time has elapsed. Car calls

for restricted landings do not register until landing access code is entered into keypad within predetermined time after landing button is pressed.

- a. Access codes are programmed at each car operating panel using a security keyswitch. Keypad operation can be activated and deactivated by security keyswitch at main landing.
4. Car-to-Lobby Feature: Feature, activated by keyswitch at main lobby, that causes car to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

2.6 DOOR REOPENING DEVICES

- A. Infrared Array: Provide door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.
- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.

2.7 CAR ENCLOSURES

- A. General: Provide enameled or powder-coated steel car enclosures to receive removable wall panels, with car roof, access doors, power door operators, and ventilation.
 1. Provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.
- B. Materials and Finishes: Manufacturer's standards, but not less than the following:
 1. Subfloor: Exterior, underlayment grade plywood, not less than 5/8-inch (15.9-mm) nominal thickness.
 2. Floor Finish: Carpet.
 3. Stainless-Steel Wall Panels: Flush, formed-metal construction; fabricated from stainless-steel sheet.
 4. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch (13-mm) fire-retardant-treated particleboard with plastic-laminate panel backing and manufacturer's standard protective edge trim. Panels shall have a flame-spread index of 25 or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern shall be as indicated in the Interior Finish Index.
 5. Fabricate car with recesses and cutouts for signal equipment.
 6. Fabricate car door frame integrally with front wall of car.
 7. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
 8. Sight Guards: Provide sight guards on car doors.

9. Sills: Extruded or machined metal, with grooved surface, 1/4 inch (6.4 mm) thick.
10. Stainless Steel Ceiling: As indicated in Basis-of-Design description.

2.8 HOISTWAY ENTRANCES

- A. Hoistway Entrance Assemblies: Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile shall accommodate hoistway wall construction.
 1. Where gypsum board wall construction is indicated, frames shall be self-supporting with reinforced head sections.
- B. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies shall comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at as close-to-neutral pressure as possible according to NFPA 252 or UL 10B.
 1. Fire-Protection Rating: 1-hour.
- C. Materials and Fabrication: Manufacturer's standards, but not less than the following:
 1. Stainless-Steel Frames: Formed from stainless-steel sheet.
 2. Star of Life Symbol: Identify emergency elevators with star of life symbol, not less than 3 inches (76 mm) high, on both jambs of hoistway door frames.
 3. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
 4. Sight Guards: Provide sight guards on doors matching door edges.
 5. Sills: Extruded or machined metal, with grooved surface, 1/4 inch (6.4 mm) thick.
 6. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

2.9 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Provide vandal-resistant buttons and lighted elements illuminated with LEDs.
- B. Car-Control Stations: Provide manufacturer's standard recessed car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.
 1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.
 2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.
- C. Emergency Communication System: Two-way voice communication system, with visible signal, which dials preprogrammed number of monitoring station and does not require handset

use. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.

1. Dedicated phone line.
 2. Notification dialer notifies answering service.
- D. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car-control station. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.
- E. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.
1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
 2. Equip units with buttons for calling elevator and for indicating desired direction of travel.
- F. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
1. Manufacturer's standard wall-mounted units, for mounting adjacent to each entrance frame located at 72 inches above the floor landing as measured to the center of hall lantern.
 2. Units mounted in both car door jambs.
- G. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.
1. At manufacturer's option, audible signals may be placed on cars.
- H. Hall Position Indicators: Provide illuminated, digital-display-type position indicators, located above each hoistway entrance at ground floor. Provide units with flat faceplate and with body of unit recessed in wall.
1. Integrate ground-floor hall lanterns with hall position indicators.
- I. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1/CSA B44, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed. For each elevator, provide illuminated signals that indicate when they are operational and when they are at the designated emergency return level with doors open.
- J. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.

2.10 FINISH MATERIALS

- A. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.
- C. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS for flat applications and Type BKV for panel backing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Examine hoistways, hoistway openings, and pits as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.
- C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.
- D. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.
- E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.
- F. Leveling Tolerance: 1/8 inch (3 mm), up or down, regardless of load and travel direction.
- G. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

H. Locate hall signal equipment for elevators as follows unless otherwise indicated:

1. For groups of elevators, locate hall push-button stations between two elevators at center of group.
2. Place hall lanterns either above or beside each hoistway entrance.
3. Mount hall lanterns at a minimum of 72 inches (1829 mm) above finished floor.

3.3 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

3.4 PROTECTION

- A. Temporary Use: Elevators can be used for construction purposes under one of the following conditions:
1. The elevator shall not be used for building construction purposes except as directed after acceptance of the complete installation or after signing of Contractor's "Temporary Acceptance" form.
 2. If Owner decides to use the elevators prior to completion of project, approval shall begin when elevators are accepted by Owner's Representative. Temporary use will not be considered final acceptance by the Owner or commencement of warranties.
- B. Comply with the following requirements for each elevator used for construction purposes:
1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
 2. Provide strippable protective film on entrance and car doors and frames.
 3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
 4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
 5. Do not load elevators beyond their rated weight capacity.
 6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
 7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator(s).
- B. Check operation of each elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

3.6 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Perform maintenance during normal working hours.
 - 2. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of two hours or less.

END OF SECTION 142123.16