hollis + miller architects®

enhancing the way people learn, work and connect + educational municipal commercial®

ADDENDUM NO. 2

Issued: December 2, 2015

Project: Ozark R-VI School District – Junior High School Additions & Renovations
1106 West Jackson
Ozark, MO 65721

Project No. 15029

Owner: Ozark R-VI School District
302 North 4th Avenue
Ozark, MO 65721

Bidding Documents Issued: November 11, 2015

This Addendum includes these 2 page[**s**] and the following attachments:

Project Manual:

000110	Table of Contents	6 pages
033523	Decorative Polished Concrete Finishes	10 pages
055000	Metal Fabrications	10 pages
079500	Expansion Control	4 pages
083473	Sound Control Door Assemblies	8 pages
085113	Aluminum Windows	6 pages
114000	Food Service Equipment	22 pages
129300	Site Furnishings	2 pages
144200	Wheelchair Lifts	6 pages

PROJECT MANUAL REVISIONS

A1 SECTION 000110 – TABLE OF CONTENTS

A1.1 REPLACE existing Section 000110 "Table of Contents" with the attached revised Section 000110 dated December 2, 2015.

A2 SECTION 033523 – DECORATIVE POLISHED CONCRETE FINISHING

A2.1 INSERT NEW Section 033523 "Decorative Polished Concrete Finishing" dated December 2, 2015, attached.

A3 SECTION 055000 – METAL FABRICATIONS

A3.1 INSERT NEW Section 055000 "Metal Fabrications" dated December 2, 2015, attached.

A4 SECTION 064023 – INTERIOR ARCHITECTURAL WOODWORK

A4.1 REPLACE Paragraph 2.13.C in Section 064023 “Interior Architectural Woodwork” with the following:

C. Display Case Hanging Shelf System.

1. **General: Shelf hanging system shall consist of 3/32 inch diameter stainless steel air craft cable, surface-mounted top receiver, glass shelf supports with rubber washer pads, and surface-mounted bottom receiver/tensioner. Metal finish shall be as selected by Architect.**
2. **Basis-of-Design Product: Subject to compliance with requirements, provide Arakawa Hanging Systems as follows:**
   a. **Top and bottom receiver: Model MF355. Furnish with 1-1/2-inch long, #10, stainless steel wood screws.**
   b. **Glass shelf supports: Model FSG1 Gripper to accommodate 3/8-inch thick glass shelving. Provide 4 per shelf.**
   c. **Cable: Provide manufacturer’s standard 3/32 inch stainless steel air craft cable.**
3. **Glass Shelves: refer to Section 088000 for requirements.**

A5 SECTION 079500 – EXPANSION CONTROL

A5.1 INSERT NEW Section 079500 "Expansion Control" dated December 2, 2015, attached.

A6 SECTION 083473 – SOUND CONTROL DOOR ASSEMBLIES

A6.1 INSERT NEW Section 083473 "Sound Control Door Assemblies" dated December 2, 2015, attached.

A7 SECTION 085113 – ALUMINUM WINDOWS

A7.1 INSERT NEW Section 085113 "Aluminum Windows" dated December 2, 2015, attached.

A8 SECTION 114000 – FOOD SERVICE EQUIPMENT

A8.1 INSERT NEW Section 114000 "Food Service Equipment" dated December 2, 2015, attached.

A9 SECTION 129300 – SITE FURNISHINGS

A9.1 INSERT NEW Section 129300 "Site Furnishings" dated December 2, 2015, attached.

A10 SECTION 144200 – WHEELCHAIR LIFTS

A10.1 INSERT NEW Section 144200 "Wheelchair Lifts" dated December 2, 2015, attached.

DRAWINGS REVISIONS – No Additional Revisions at the time.

END OF ADDENDUM NO. 2

DOCUMENT 000110 - TABLE OF CONTENTS

Ozark Junior High School Addition and Renovation
1109 West Jackson
Ozark, Missouri 65721

Project No. 15029

END OF TABLE OF CONTENTS

SECTION 033523 – DECORATIVE POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes provision for decorative polished concrete floor finish, including but not limited to:
   1. Decorative saw cutting.
   2. Preparation of cast-in-place concrete floor slabs.
      a. Joint and crack filling.
      b. Grinding.
   3. Application of concrete dye/stain.
   4. Application of concrete hardener/sealer.
   5. Application of polish guard sealer.
   6. Diamond polishing of concrete.
   7. Application of seal coat and buffing/burnishing.
   8. Filling contraction/control joints in slabs.

B. Related Requirements:
   1. Section 012300 “Alternates” for those alternates effecting work of this Section
   2. Section 033000 "Cast-in-Place Concrete" for concrete not designated as polished concrete.

1.2 REFERENCES

A. ASTM International
   1. ASTM C 779 “Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.”

B. Concrete Polishing Association of America (CPAA)

C. National Floor Safety Institute (NFSI):
   1. NFSI Test Method 101-A “Standard for Evaluating High-Traction Flooring Materials, Coatings and Finishes.”

1.3 DEFINITIONS

A. Design Reference Sample: Sample designated by Architect in the Contract Documents that reflects acceptable surface quality and appearance of polished concrete.

B. The Concrete Polishing Association of America (CPAA).
   1. The CPAA defines diamond-polished concrete as “the processing of the concrete surface through means of a mechanical process that uses an abrasive medium where each step is refined to its purest possible form on a microscopic level from one progressively finer abrasive to the next until the desired level of “polish” is achieved.”

C. Dyes: Extremely fine molecules of color solvent or dye for mixing with water or acetone that is designed to penetrate and color concrete surface.

D. Pigmented Microstains: Extremely fine pigment particles in water-based silicate solution that penetrates concrete and reacts with calcium hydroxide to lock in color particles.

E. Aggregate Exposure:
   1. Class A - Cream Finish: Polish portland cement paste resulting in little to no aggregate exposure.
   2. Class B - Fine Aggregate (Salt & Pepper) Finish: Remove not more than 1/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with little to no medium aggregate exposure at random locations.
   3. Class C - Medium Aggregate Finish: Remove not more than 1/8 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying medium aggregate with little or no large aggregate exposure at random locations.
   4. Class D - Large Aggregate Finish: remove not more than 1/4 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying large aggregate with little to no small and medium aggregate exposure at random locations.

F. Sheen Levels:
1. Level 1 – Low Gloss Appearance:
a. Procedure: Not less than 4 step process with full refinement of each diamond pad up to 400 grit resin-bonded pad with one application of liquid hardener/densifier.
b. Gloss Reading: Not less than 40 according to ASTM E 430 before polish guard application.
2. Level 2 – Medium Gloss Appearance:
a. Procedure: Not less than 5 step process with full refinement of each diamond pad up to 800 grit resin-bonded pad with one application of liquid hardener/densifier.
b. Gloss Reading: Not less than 55 according to ASTM E 430 before polish guard application.
3. Level 3 – High Gloss Appearance:
a. Procedure: Not less than 6 step process with full refinement of each diamond pad up to 1500 grit resin-bonded pad with one application of liquid hardener/densifier.
b. Gloss Reading: Not less than 60 according to ASTM E 430 before polish guard application.
4. Level 4 – Very High Gloss Appearance:
a. Procedure: Not less than 7 step process with full refinement of each diamond pad up to 3000 grit resin-bonded pad with one application of liquid hardener/densifier.
b. Gloss Reading: Not less than 70 according to ASTM E 430 before polish guard application.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Prior to placing concrete for areas scheduled to receive decorative polished concrete finish, conduct conference at Project site to comply with requirements in applicable Division 1 Sections and as follows:
1. Required Attendees
a. Owner, Architect and Contractor.
b. Contractor's superintendent.
c. Concrete producer.
d. Concrete finisher, including supervisor/lead foreman.
e. Concrete polisher, including supervisor/lead foreman.
f. Technical representative of each type of liquid applied product manufacturer.
g. Independent testing agency responsible for concrete design mixtures.
2. Agenda: Polisher shall demonstrate understanding of work required by reviewing and discussing procedures for, but not limited to, following:
a. Tour field mockup and representative areas of required work, discuss and evaluate for compliance with required Contract Documents, including substrate conditions, surface preparation, sequence of procedures and other preparatory work performed by other installers and related trades.
b. Review Contract Documents.
c. Review approved submittals.
d. Review procedures, including, but not limited to:
1) Details for each step of grinding, honing and polishing operations.
2) Application of colorants.
3) Application of liquid applied products, other than colorants.
4) Protecting concrete floor surfaces until polishing work begins.
5) Protecting polished concrete floors after polishing work is completed.
3. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party in attendance.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated and specified. Include mixing and application instructions for each product. Also include liquid chemical manufacturer's maintenance and cleaning instructions.

B. Shop drawings, clearly indicating layout of decorative saw cuts and location of each color, location of contraction/control joints, location of columns, doorways, enclosing walls/partitions and built-in cabinets in addition to the following:
1. Show installation details at any special conditions.
2. Show detail for edge transition between macro-topping and adjacent floor finish.

C. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.

D. Samples for Initial Selection:
   1. Submit samples for each color, in the form of dye/stain manufacturer's color charts. Color samples shall indicate full range of available colors that represent as closely as possible those colors selected.
   2. Submit color samples for joint sealants and other treatments for contraction/control joints. Samples shall be in the form of sealant manufacturer's color charts, indicating full range of available colors.

E. Samples for Verification: For each type of exposed color and each sheen.
   1. Samples shall be in the form of actual colored concrete not less than 3 inches square. Samples shall represent each color selected.
   2. Submit color samples for joint sealants and other treatments for contraction/control joints. Samples shall be in the form of actual samples, not less than 3 inches long. Color samples shall indicate each color selected.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer/Polisher:

B. Material Certificates: For each of the following, signed by manufacturers:
   1. Repair materials.
   2. Dye/Stain materials.
   3. Liquid floor treatments.

C. Field Quality Control: Submit certified test reports by an independent testing laboratory for the following:
   1. Static Coefficient of Friction.
   2. Finished Gloss Levels.

D. Minutes of pre-installation conference.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Requirements: For inclusion in Maintenance Manuals.
   1. Include manufacturer's instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.
   2. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

1.8 QUALITY ASSURANCE

A. Installer/Polisher Qualifications: Engage an Installer/Polisher, experienced in performing specified work similar in design, products and extent to scope of this Project; with a record of successful in-service performance. Installer/polisher shall be certified and/or trained by chemical manufacturer with experience in application and installation of systems similar to complexity to those required for this Project, plus the following:
   1. Submit written letters from chemical manufacturer confirming that installer/applicator has been certified and/or trained by chemical manufacturer.
      a. Furnish separate certifications for polished concrete and colored polished concrete.
   2. Installer shall have a minimum of seven (7) years continuous experience under current company name; in grinding concrete, installing/applying dyes/stains, installing/applying hardeners/densifiers/sealers and polishing concrete.
   3. Installer/polisher shall submit a reference list, complete with Owner, Architect, General Contractor or Construction Manager (as applicable); phone number of each, and square footage installed of at least seven (7) completed projects in the states of Missouri and Kansas similar in size and specification.
      a. List each type of material used, detailed procedure for installation/application, quantity installed and dates completed.
   4. Installer/polisher shall assign experienced mechanics from previous applications, including lead mechanic/supervisor, for this Project. Lead mechanic/supervisor shall be currently certified as a Craftsman or Master Craftsman by CPAA.
   5. Installer/polisher shall have sufficient production capability, facilities and personnel to produce specified work.

B. Single Source Responsibility: Obtain each type of product from a single manufacturer and single source, to ensure system compatibility, color and sheen. Where system components are provided from separate manufacturers, submit written statement from each product manufacturer certifying compatibility of system components.
   1. Sealants may be from a separate manufacturer.

C. Testing Agency: Certified by CPAA or NFSI to test polished floors for static and dynamic coefficient of friction according to ANSI B101.1 and B101.3.

D. Coefficient of Friction: Achieve the following coefficient of friction by field quality control testing in accordance with the following standards:
   1. ANSI B101.1 "Static Coefficient of Friction"; achieve a minimum of 0.42 for level floor surface.
   2. ANSI B101.3 "Dynamic Coefficient of Friction"; achieve a minimum of 0.35 for level floor surface.

E. Field Mock-Up: Before performing work of this Section, provide as many field mockups required to verify selections made under submittals and to demonstrate aesthetic effects of coloring, grinding (aggregate exposure) and polishing for each type of finish. Apply surface finishes to concrete field samples in presence of Architect and Contractor. Provide workmanship and procedures as required to meet Architect's and Owner's approval. Approval does not constitute approval of deviations from Contract Documents, unless such deviations are specifically brought to the attention of and accepted by Architect in writing
   1. Field/Mockup Sample: Apply decorative polished concrete floor finish to field samples to demonstrate workmanship to be expected for the Work, including but not limited to: typical decorative saw cutting, treatment of control/contraction joints, slab preparation and repairs, cleaning, grinding, application of hardener/densifier, polish guard application, polishing for sheen, application of finish sealer and burnishing.
      a. Field samples shall be approximately 100 sq. ft. Concrete for the field sample shall have been placed on the same day, preferably same pour, as floors indicated to receive decorative concrete finish.
      b. Field samples shall be divided into six equally-sized panels/areas, 3 panels on 2 sides. Left side of the mockup shall have a Class B aggregate exposure and the opposite side shall have a Class C aggregate exposure.
         1) Lower left: natural grey color and Level 2 sheen.
         2) Upper left: colored concrete and Level 2 sheen. Color to be determined by Architect.
         3) Lower right: natural grey color and Level 2 sheen.
         4) Upper right: colored concrete and Level 2 sheen. Color to be determined by Architect.
      c. Field sample criteria:
         1) Aggregate exposure classifications:
            a) Left side shall be "Class B - Fine Aggregate (Salt & Pepper) Finish".
            b) Right side shall be "Class C – Medium Aggregate".
         2) Finish Gloss Level: Polish field/mock-up sample area to achieve a Level 2 - Medium Gloss appearance
         3) Color: Refer to Material Finish Legend.
      d. Field samples shall be finished to desired uniformity of exposed aggregate, uniformity of color, uniformity of sheen/gloss and treatment of joints. When approved, samples will serve as standard for the project.
      e. Use same personnel, including supervisor/lead foreman, which will perform work.
      f. Gloss meter readings shall be taken of approved area and documented. Not less than 8 readings shall be taken for each approved finish and these values averaged. The average value shall be used as the basis for acceptability of finished areas for each color**/**finish.
      g. Approved mockup panels shall be demolished and legally disposed of offsite after Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original undamaged packages or acceptable bulk containers. All packaging and containers shall bear manufacturer's labels indicating brand name and directions for storage.

B. Store packaged materials to protect them from elements or physical damage and from freezing.

1.10 PROJECT CONDITIONS

A. Concrete Damage and Stain Prevention: Contractor shall protect areas to receive decorative polished concrete floor finish at all times during construction to prevent damage and staining from; oils, dirt, metal rust, excessive water and other potentially damaging materials from effecting the finished concrete surface. Protection measures listed below shall begin as soon as possible after concrete is poured:
   1. Prohibit vehicle parking and driving over concrete surfaces to receive decorative concrete finish.
   2. Prohibit storage of any items over concrete surfaces to receive decorative floor finish for not less than 28 days after concrete placement.
   3. Protect from petroleum, oil, hydraulic fluids and other liquid dripping onto areas to receive the decorative concrete finish.
      a. All hydraulic equipment shall be diapered to avoid concrete staining.
   4. Protect concrete slab areas to receive decorative floor finishing from contact with acids and acidic detergents.
   5. Pipe cutting machines shall not be allowed on areas to receive the decorative concrete finish
   6. Steel shall not be placed/stored on the concrete slab to avoid rust stains.
   7. All painters shall use drop cloths in areas to receive decorative concrete floor finish. Any paint on the slab shall be removed immediately.
   8. All trades shall be informed that the concrete slab areas to receive colored concrete floor finish are to be protected at all times, prior to and after decorative concrete floor finishing operations.

B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting decorative polished concrete floor system application.
   1. Place decorative polished concrete floor system only when ambient temperature and temperature of base slabs are between 50 and 100 deg F.
   2. Do not commence work until the building can be maintained at a minimum temperature of 50 deg F for 48 hours before, during, and 48 hours after application. Provide adequate controlled ventilation and bright, uniform lighting during application and inspections.

C. Sequencing: Perform work of this Section after all wet work, such as painting has been completed in areas scheduled to receive decorative polished concrete floor finish.
   1. Close areas to traffic during topping application and, after application, for time period recommended in writing by manufacturer.

D. Surfaces must be acceptable in accordance with decorative concrete Contractor’s recommendations.
   1. Notify Architect and Contractor in writing of unsuitable surfaces and conditions. Commencement of work implies acceptance of surfaces and working conditions.

1.11 WARRANTY

A. Manufacturer’s Warranty – Colored and Polished Finish: Provide 10 year manufacturer’s material warranty commencing at date of Substantial Completion. Manufacturer shall warrant to the Owner that the colored and polished surface will remain colorfast, water repellent, dustproof, hardened, abrasion and food stain resistant.

B. Manufacturer’s Warranty - Polished Finish: Provide 10 year manufacturer’s material warranty commencing at date of Substantial Completion. Manufacturer shall warrant to the Owner that the polished surface will remain water repellent, dustproof, hardened and abrasion and food stain resistant.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Specification: Subject to compliance with requirements provide liquid chemical products from the one of the following:
   1. American Decorative Concrete Supply Company.
   2. Ameripolish, Inc.
   3. The Bomanite Company.
   4. Vexcon Chemicals, Inc.
   5. Comparable systems and products from other manufacturers will be considered, provided that they meet or exceed specified requirements and they are submitted to and approved by the Architect.

2.2 SYSTEM DESCRIPTIONS

A. General:
1. Finish for decorative colored and polished concrete slabs shall be designated as PC on the Material Finish Legend.
a. Aggregate exposure shall be Class "C" medium aggregate finish with color as selected by Architect and sheen matching Level 2 requirements for "Medium Gloss" appearance.

B. System Properties: Finish shall be clear or colored; water, wear, chemical, stain and oil resistant, non-slip and require limited maintenance. System shall be breathable.
1. Refer to Material Finish Legend and Schedules for polished, and colored and polished concrete finish locations.

2.3 MATERIALS

A. Concrete Dyes/Stains: Provide a translucent, pre-packaged liquid, solvent-based dye/stain formulated using active silicates, penetrating and wetting agents and extremely fine molecules of color. Up to three colors may be selected by the Architect. Manufacturer's standard color offering shall not be less than 20 colors.
1. Manufacturer's and Products – Basis of Design:
a. Vexcon Chemicals, Inc.; "Certi-Shine Stain FSR"
b. American Decorative Concrete Supply Company; "AmeriPolish" polished concrete dye.
c. Bomanite; "Panete Teres" concrete dye.
d. Comparable products from other manufacturers will be considered when submitted to and approved by the Architect prior to bidding.

B. Pigmented Micro Stains: Provide manufacturer's pigmented microstain having fine pigment particles ($<3.9 \times 10^{-4}$ inches) suspended in solvent based solution that penetrates concrete and reacts with calcium hydroxide to lock in color particles.

C. Liquid Hardener/Densifier: Provide an odorless, non-hazardous, penetrating type silicate designed to react with free lime and calcium hydroxide in concrete to produce permanent chemical reaction that hardens and densifies concrete surface. Penetrating hardener/densifier shall be compatible with subsequently applied sealers. Penetrating sealer shall not trigger nor contribute to surface alkali silicate reaction. Penetrating sealer shall have a VOC content of not greater than 40 g/L.
1. Manufacturers and Products:
a. Vexcon Chemicals, Inc.; "Certi-Shine Clear".
b. Comparable products from other manufacturers will be considered when submitted to and approved by the Architect prior to bidding.

D. Polish Guard - Stain, Food and Chemical Resistant Sealer: Provide a non-film forming; stain, food and chemical resistant impregnating sealer designed to be used on concrete surfaces previously hardened and densified. Provide an inorganic salt solution designed as a fixative for increasing resistance to food acids and chemicals. Sealer shall have a VOC content of not greater than 40 g/L.
1. Manufacturers and Products:
a. Vexcon Chemicals, Inc.; "Certi-Shine Fixative".
b. Comparable products from other manufacturers will be considered when submitted to and approved by the Architect prior to bidding.

E. Concrete Finishing Sealer: Provide a water-based, clear, ready-to-use, penetrating type alkyl-alkoxy silane and silane polymer blend sealer designed to seal concrete from intrusion of water, salts, food acids, oils and produce a high gloss finish after buffing/burnishing. Penetrating sealer shall be compatible with concrete dye/stain and previously applied sealers. Sealer shall not produce a surface build up, discolor the concrete finish and effect the surface texture. Penetrating sealer VOC content not to exceed 250 g/L.
1. Manufacturers and Products:
a. Vexcon Chemicals, Inc.; "Certi-Shine Finish Coat".
b. Comparable products from other manufacturers will be considered when submitted to and approved by the Architect prior to bidding.

F. Joint Sealants: Semi-rigid 2-part polyurea type.
1. Shore A Hardness: 75 to 80 when tested in accordance with ASTM D 2240.
2. Tensile strength: 1160 pounds per square inch when tested in accordance with ASTM D 412.
3. Products: Subject to compliance with requirements, provide the following:

a. Curecrete Distribution Company, Inc.: Ashford Crete-Fill.
b. L&M Construction Chemicals, Inc.: Joint Tite 750.

G. Water: Potable, free from deleterious material that may affect color stability.

H. Patching Compound: Compound composed of 40 percent portland cement, 45 percent limestone, and 15 percent vinyl acetate copolymer, when mixed with dust salvaged from grinding process, forms a paste that hardens when surface imperfections are filled.
1. Imperfections include, but are not limited to: exposed air pockets, holes due to lost aggregate,etc.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Installer shall examine subfloor surfaces with Contractor and Architect present to verify all substrates and conditions are satisfactory. A satisfactory subfloor surface is defined as one that is smooth and free from stains, cracks, holes, ridges, curing compounds and other coatings/contaminants which could interfere with application of decorative polished concrete floor system, and other defects impairing performance or appearance.

B. Do not proceed with work of this Section until concrete slab surfaces are satisfactory. Commencement of decorative polished concrete flooring work is construed as applicator's acceptance of surfaces within particular area.

3.2 PREPARATION

A. General: Comply with liquid chemical manufacturer's written instructions and recommendations for preparation of substrate in addition to the following:
1. Remove hardware, hardware accessories, plates, machined surfaces, and similar items which are not to be colored; or provide surface-applied protection prior to surface preparation and coating. Remove these items if necessary for complete coating of the items and adjacent surfaces. Following completion of coating operations in each space or area, reinstall items removed, using workmen skilled in the trades involved.
2. Clean surfaces before applying decorative polished concrete finish system. Schedule cleaning and coating application so dust and other contaminates will not fall on wet, newly coated surfaces.
3. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of floor finishing chemicals. Cover adjoining and nearby surfaces of aluminum, glass, drywall, etc. where there is the possibility of the chemicals being deposited on surfaces. Immediately clean chemicals from adjoining surfaces, complying with manufacturer's cleaning recommendations.
a. Prevent spillage and runs of chemicals onto adjacent surfaced to best extent possible.
b. Protect adjacent materials and finishes from physical damage during finishing operations.
c. Provide protections as required and remove from site at completion of work.

B. Moisture and Alkalinity Testing
1. Perform moisture, and alkalinity tests on concrete slabs indicated to receive decorative floor finish to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compounds.
2. No more than seven days prior to the scheduled installation, test the slab for moisture and alkalinity. Submit to the Architect and General Contractor a written report on the moisture and alkaline condition of the slab. Submit test findings to Architect.
a. Test the concrete using a calcium chloride crystal test kit or perform relative humidity testing in accordance with ASTM F 2170 when recommended by liquid hardener/densifier manufacturer to suit conditions existing at the site in areas to receive decorative concrete floor finish.
b. Test the concrete for surface alkaline using pH test paper in accordance with ASTM F 710.
3. Perform testing and document results for not less than every 1000 sq ft of floor area. Preform tests where resilient surfacing is to be installed. The concrete slab must have a minimum 90 days for proper curing to reach acceptable dryness prior to testing. Conduct tests after space has been maintained at a temperature of 50 deg F or higher for not less than 48 hours and relative humidity ranges from 30 to 50 percent.
4. Acceptable Results:
a. Optimum emissions rate for moisture shall be 5 pounds of water per 1000 sq ft.
b. Optimum relative humidity level; relative humidity shall not exceed 75 percent.
c. Optimum alkalinity; pH between 8 and 10.
5. Do not proceed with flooring work until subfloor surfaces are satisfactory. Start of decorative concrete floor finish work is construed as applicator's acceptance of surfaces within particular area.

C. Surface Preparation: Perform surface preparation and cleaning in compliance with the decorative polished concrete floor system (liquid chemical) manufacturer's written instructions for particular substrate conditions, and as specified.
   1. Decorative Saw Cutting: Layout saw cut locations in accordance with approved shop drawings and obtain Architect's written acceptance prior to saw cutting. Decorative saw cuts shall be dry cut and the dust simultaneously vacuumed. Saw cuts shall be 1/8" wide by 1/8" to 1/4" in depth. Saw cuts shall be true to line and continuous.
   2. Initial Preparatory Cleaning: Clean surfaces of concrete to receive decorative polished concrete floor system by removing stains, efflorescence, chalk, dust, dirt, release agents, grease and oils. Treat oil spots with oil emulsifier and oil absorber materials as recommended by chemical manufacturer.
   3. Initial Grinding: As recommended by colored concrete floor finish (chemical) manufacturer, mechanically sand/grind cured concrete surfaces to achieve levels used on approved field samples. Grinding shall also be done to level the slab as much as possible without exposing aggregate. Grinding machine shall have an integral dust extraction system.
   4. Final Preparatory Cleaning: Clean surfaces of concrete to receive colored concrete floor system by removing dust, dirt, and other debris left from saw cutting and grinding/sanding procedures.
      a. Dust extraction system shall be equipped with a pre-separator and squeegee.

3.3 APPLICATION OF COLORED CONCRETE FLOOR FINISH

A. General: Begin application of decorative polished floor finish as determined by application on approved field samples to achieve matching aggregate exposures, color intensities and sheen levels.
   1. Surface Continuity: Perform finishing in as continuous an operation as possible, utilizing same work crew to maintain continuity of finish on each surface or area of work.

B. Material Preparation: Carefully mix and prepare materials in compliance with the liquid chemical manuacturer's written instructions.
   1. Stir materials before application to produce a mixture of uniform density and color, and as required during application.

C. Dye or Pigmented Microstain Application: Apply concrete dye/stain in strict accordance with dye/stain manufacturer's written instructions and to match application, color uniformity and color intensity on approved field mockup samples.
   1. Maintain wet edge, working newly applied solution into edges of adjacent wet edges of previously treated surfaces.
   2. Maintain consistent saturation throughout application.
   3. Avoid splashing, dripping and puddling of solution on adjacent substrates.
   4. When color matches approved field mockup, neutralize as required by dye/stain manufacturer.

D. Hardener/Densifier Application: Apply hardener/densifier/sealer in strict accordance with sealer manufacturer's written instructions, to match application and finish on approved field samples.

E. Polish Guard – Food Acid and Chemical Resistant Sealer: Apply sealer in strict accordance with sealer manufacturer's written instructions, to match application and finish on approved field samples.

F. Dry Diamond Polishing: Polish concrete in strict accordance with liquid chemical manufacturer's written instructions, to match application and finish on approved field samples.

G. Joint Sealing: After polishing, fill contraction/control joints with approved full depth semi-rigid two-component epoxy joint filler, designed specifically for this purpose.
   1. Do <u>not</u> fill moving isolation joints or expansion joints.

H. Buffing/Burnishing: Apply finishing sealer in strict accordance with liquid chemical manufacturer's written instructions, to match application and finish on approved field samples

3.4 POLISHING CONCRETE FLOORS

A. General: Begin application of decorative polished floor finish as determined by application on approved field mockup samples to achieve matching aggregate exposure and sheen levels.
   1. Surface Continuity: Perform finishing in as continuous an operation as possible, utilizing same work crew to maintain continuity of finish on each surface or area of work.

2. Use hand equipment against walls for work of this Section as necessary for grinding, honing, polishing and burnishing to maintain uniformity of aggregate exposure and finish.

B. Sequence of Polishing: Perform polishing after partitions studs are erected, but before gypsum board is installed.

C. Initial Grinding:
1. Use grinding equipment with metal-bonded grinding pads.
2. Begin grinding in one direction using sufficient size grit pad.
3. Make sequential passes with each pass perpendicular to previous pass using finer grit pad with each pass up to 150 grit.
4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
5. Vacuum floor using squeegee vacuum attachment after each pass.
6. Continue grinding until aggregate exposure matches approved field mockup sample.

D. Treating Surface Imperfections:
1. Mix patching compound with dust created by grinding operations to match color of adjacent concrete surface.
2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro-cracks, air holes, pop-outs and voids.
3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not reasonably noticeable when viewed from 10 feet away under lighting conditions that will be present after construction.

E. Dye or Pigmented Microstain Application: Apply concrete dye/stain in strict accordance with dye/stain manufacturer's written instructions and to match approved field mockup samples.
1. Maintain wet edge, working newly applied solution into edges of adjacent wet edges of previously treated surfaces.
2. Maintain consistent saturation throughout application. Remove excess.
3. Avoid splashing, dripping, and puddling of solution on adjacent substrates.
4. When color matches approved field mockup, neutralize as required by dye/stain manufacturer.

F. Liquid Hardener/Densifier Application:
1. Apply undiluted in strict accordance with liquid chemical manufacturer's written instructions, to match application and finish on approved field samples. Remove excess liquid, and allow to cure according to manufacturer's instructions.

G. Honing:
1. Use grinding equipment with resin-bonded grinding pads.
2. Grind concrete in one direction starting with 50 grit pad and make as many sequential passes required to remove scratches, each pass perpendicular to previous pass, up to 400 grit pad reaching maximum refinement with each pass before proceeding to finer grit pads.
3. Auto-scrub or vacuum floor using squeegee vacuum attachment after each pass.

H. Polishing:
1. Use polishing equipment with resin-bonded polishing and burnishing pads.
2. Begin polishing in one direction starting with 800 grit pad.
3. Make sequential passes with each pass perpendicular to previous pass using finer grit pad with each pass, up to 800 grit and until aggregate exposure matches that of approved mockup sample.
4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
5. Auto-scrub or vacuum floor using squeegee vacuum attachment after each pass.
6. Continue polishing until gloss appearance, as measured according to ASTM D5767 and ASTM D 523, matches approved field mockup sample.

I. Polish Guard:
1. Uniformly apply and remove excess liquid according to chemical manufacturer's written instructions.

J. Final Polished Concrete Floor Finish:
1. Using burnishing equipment and finest grit burnishing pads, burnish to a uniform sheen matching approved field mockup sample.

K. Final Polished Concrete Floor Finish Properties:
1. Aggregate Exposure:

a. Slab on Grade: Class B - Fine Aggregate (Salt & Pepper) Finish: Remove not more than 1/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with little to no medium aggregate exposure at random locations.

2. Finished Gloss Levels:
   a. Level 2 – Medium Gloss Appearance:
      1) Procedure: Not less than 5 step process with full refinement of each diamond pad up to 800 grit resin-bonded pad with one application of liquid hardener/densifier.
      2) Gloss Reading: Not less than 55 according to ASTM E 430 before polish guard application.
      3) Gloss Measurement: Determine specular gloss by incorporating the following:
         a) Reflective Clarity Reading: Not less than 55 according to ASTM D 5767 prior to application of sealers/polish guard.
         b) Reflective Sheen Reading: Not less than 25 according to ASTM D 523 prior to application of sealers/polish guard.

3.5 FIELD QUALITY CONTROL

A. Field Testing: Engage a qualified testing agency to perform field testing according to NFSI 101-A to determine if polished concrete floor finish complies with specified static coefficient of friction.
   1. Performance Criteria: Decorative polished concrete floor finish shall achieve not less than 0.5 for level floor surfaces as determined according to NFSI 101-A.

3.6 CLOSEOUT ACTIVITIES

A. Maintenance Training: CPAA Master Craftsman shall train Owner's designated personnel in proper procedures for maintaining polished concrete floor.

3.7 CLEANUP AND PROTECTION

A. Clean-Up: At the end of each work day, remove rubbish, empty cans, rags and other discarded materials from site.
   1. Upon completion of work, clean up spattered surfaces. Remove spattered coatings by washing, scraping or other proper methods. Do not scratch or damage adjacent finished surfaces.

B. Cure decorative polished concrete floor finish, in compliance with chemical manufacturer's directions, to prevent their contamination, staining and damage.

C. Clean decorative polished concrete floors just prior to substantial completion. Use materials and procedures recommended by chemical manufacturer.

D. Protect decorative polished concrete floor finish from damage and staining during construction operations. Where temporary covering is required for this purpose, comply with chemical manufacturer's recommendations for protective materials and method of their application. Remove temporary covering just prior to cleaning and final inspection.

END OF SECTION 033523

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Steel framing and supports for operable partitions.
2. Steel framing and supports for overhead doors.
3. Miscellaneous Steel Framing and Supports for:
   a. Storefront.
   b. Steel framing and supports for applications where framing and supports are not specified in other Sections.
4. Steel framing and supports for countertops.
5. Steel tube reinforcement for low partitions.
6. Steel framing and supports for mechanical and electrical equipment.
7. Steel framing and supports for applications where framing and supports are not specified in other Sections.
8. Steel shapes for supporting elevator door sills.
9. Shelf angles (055000.A05)
10. Metal ladders (055000.A06)
11. Metal bollards (055000.A14)
12. Metal downspout boots (055000.A16)
13. Loose bearing and leveling plates for applications where they are not specified in other Sections.
14. Supports and framing for trash enclosure gates (055000.A24)
15. Supports and framing for trash enclosure (055000.A24)
16. Perforated and fabricated architectural metal panel system (055000.A26)

B. Products furnished, but not installed, under this Section include the following:
1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:
1. Section 012100 “Allowances” for those allowances effecting work of this Section.
2. Section 012200 “Unit Prices” for those unit prices effecting work of this Section.
3. Section 012300 “Alternates” for those alternates effecting work of this Section.
4. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
5. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
6. Section 051200 "Structural Steel Framing."

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:
1. Nonslip aggregates and nonslip-aggregate surface finishes.
2. Paint products.
3. Grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
   1. Steel framing and supports for operable partitions.
   2. Steel framing and supports for overhead doors.
   3. Steel framing and supports for countertops.
   4. Steel tube reinforcement for low partitions.
   5. Steel framing and supports for mechanical and electrical equipment.
   6. Steel framing and supports for applications where framing and supports are not specified in other Sections.
   7. Steel shapes for supporting elevator door sills.
   8. Shelf angles.
   9. Metal ladders.
   10. Metal bollards.
   11. Metal downspout boots.
   12. Loose steel lintels.
   13. Miscellaneous steel framing and supports.
   14. Trash enclosure gates.
   15. Trash enclosure framing.
   16. Perforated and fabricated architectural metal panels.

C. Delegated-Design Submittal: For ladders and fabricated architectural metal panel systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.

C. Welding certificates.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

E. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders.

B. Structural Performance of Ladders: Ladders shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
   1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

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

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.

D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

E. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

G. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.

H. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

I. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
   1. Provide stainless-steel fasteners for fastening aluminum.
   2. Provide stainless-steel fasteners for fastening stainless steel.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3; with hex nuts, ASTM A 563, Grade C3; and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1 (A1).

E. Anchor Bolts: ASTM F 1554, Grade 55, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
   1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

F. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

G. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

H. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
   1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
   2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

2.4 MISCELLANEOUS MATERIALS

A. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting," Section 099123 Interior Painting," and Section 099600 "High-Performance Coatings."

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

F. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS (055000.A01)

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
   1. Furnish inserts for units installed after concrete is placed.
   2. Galvanize miscellaneous framing and supports for exterior application and where indicated for interior applications.

C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as indicated. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

D. Galvanize miscellaneous framing and supports where indicated.

E. Prime miscellaneous framing and supports with [zinc-rich primer] [primer specified in Section 099600 "High-Performance Coatings"] where indicated.

2.7 SHELF ANGLES (055000.A05)

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and 24 inches (600 mm) o.c., unless otherwise indicated.
   1. Provide mitered and welded units at corners.
   2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches (50 mm) larger than expansion or control joint.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.

C. Galvanize and prime shelf angles located in exterior walls.

D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.8 METAL LADDERS (055000.A06)

A. General:
   1. Comply with ANSI A14.3.

B. Steel Ladders:
   1. Space siderails 18 inches apart unless otherwise indicated.
   2. Siderails: Continuous, 1/2-by-2-1/2-inch (12.7-by-64-mm) steel flat bars, with eased edges.
   3. Rungs: Interior - "Small Hole Traction Tread" plank ladder rungs as manufactured by McNichols Co. Traction treads shall be 3-row type, 1-5/8 inches wide by 1-1/8 inches high having a weight of at least 1.3 lbs/lf.
   4. Rungs: Exterior – “Diamond Safety Grating”: 1-1/8 inch Ladder Rung, pre-galvanized as manufactured by Marco Specialty Steel, Inc.
   5. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
   6. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
   7. Provide platforms as indicated with “Diamond Safety Grating”: 10 diamond / 24 inch width; 12 gauge pre-galvanized as manufactured by Marco Specialty Steel, Inc.
   8. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded or bolted steel brackets.
   9. Galvanize and prime exterior ladders, including brackets.

2.9 METAL SHIPS' LADDERS (055000.A09)

A. Provide metal ships' ladders where indicated. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Angle of incline for ship’s ladders shall be 60 degrees. Provide brackets and fittings for installation.
   1. Fabricate ships' ladders including railings from aluminum.
      a. Where ship’s ladder provides access to roof hatch, fabricate railing to accommodate roof hatch access.

2. Fabricate treads and platforms from extruded-aluminum plank grating or from pressure-locked aluminum bar grating. Provide ladder manufacturer's standard aluminum railing secured to ship's ladder.
   a. Limit openings in gratings to no more than 3/4 inch in least dimension.
3. Treads shall be not less than 5 inches exclusive of nosing or less than 8-1/2 inches including the nosing, and riser height shall be not more than 9-1/2 inches.
4. Angles of Incline: As indicated on Drawings

B. Provide aluminum ship's ladders, including treads, railings, brackets and fasteners with a clear anodized finish.

C. Structural Performance: Ladder shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
1. Uniform Load: 100 lbf/sq. ft.
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.

D. Basis-of-Design Products: Subject to compliance with requirements, provide the following ship's ladders as manufactured by Okeefe's, Inc.
1. Model #520 "Ship's Ladder."
2. Model #523 "Ship's Ladder with Access to Roof Hatch."

2.10 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize and prime exterior miscellaneous steel trim. Prime interior miscellaneous steel trim.

2.11 METAL BOLLARDS (055000.A14)

A. Fabricate metal bollards from Schedule 40 steel pipe of diameter indicated, having a 1/4-inch wall-thickness, unless another wall thickness is indicated on the drawings.

B. Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch wall-thickness steel tubing with an OD approximately 1/16 inch less than ID of bollards. Match drill sleeve and bollard for 3/4-inch steel machine bolt.
1. All bollards shall be filled with concrete.

C. Galvanize bollards. Prime bollards with primer specified in Section 099600 "High-Performance Coatings."

D. Pre-Manufactured Bollard Post Sleeves: Provide a pre-manufactured bollard post sleeve with integral domed cap. Bollard sleeve shall be manufactured from high density polyethylene (HDPE). Sleeve surface shall be smooth. Diameter of sleeve be slightly larger than outside diameter of bollard. Furnish with manufacturer's standard installation accessories. Color as selected by Architect from full range of manufacturer's standard colors.
1. Basis-of-Design Product: Subject to compliance with requirements, provide "HDPE Bollard Covers" as manufactured by Omega Industrial Products. Comparable products from other manufacturers will be considered that meet specified requirements, and which are submitted to and accepted by Architect prior to bidding.

2.12 METAL DOWNSPOUT BOOTS (055000.A16)

A. Provide downspout boots made from cast aluminum in heights indicated with inlets of size and shape to suit downspouts. Provide units with flanges and holes for countersunk anchor bolts.
1. Outlet: Vertical, to discharge into pipe.

B. Prime boots with primer specified in Section 099600 "High-Performance Coatings."

2.13 LOOSE BEARING AND LEVELING PLATES (055000.A21)

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

2.14 LOOSE STEEL LINTELS (055000.A22)

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches (200 mm) unless otherwise indicated.

C. Galvanize and prime loose steel lintels located in exterior walls.

2.15 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.16 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.17 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
   1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, or masonry, or unless otherwise indicated.

D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.18 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

2.19 PERFORATED AND FABRICATED ARCHITECTURAL METAL PANEL SYSTEM (055000.A26)

A. Basis of Design Product: Subject to requirements provide products from Hendrick Architectural Products or comparable products from another manufacturer submitted to and accepted by Architect prior to bidding meeting the following product characteristics:
   1. Description: System shall include design and installation of panels, substructure, and anchorage to structural steel columns, and cold form steel framing for interior and exterior conditions as indicated on drawings.
   2. Material: Aluminum per ASTM B209

a. Thickness: 0.125 inch 5052-H32 Aluminum
b. Sheet Size: See drawings.
c. Shape: Flat
d. Finish: Fluoropolymer Finish
e. Color: Approved by Architect

3. Perforations:
   a. Round: Multiple diameters. Custom image patter (see drawings). Architect to supply hi-res image for perforation patter creation.
4. End Pattern: Finished
5. Panel Edges: Minimum margins as tooling and patter allows.
6. Accessories:
   a. Equip Panels with J style bends on 4 edges for concealed fastening.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
   1. Cast Aluminum: Heavy coat of bituminous paint.
   2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions securely to, and rigidly brace from, building structure.

C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
   1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

3.3 INSTALLING METAL BOLLARDS

A. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

B. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.

C. Place removable bollards over internal sleeves and secure with 3/4-inch machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. Owner furnishes padlocks.

D. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.
   1. Do not fill removable bollards with concrete.

E. Install pre-manufactured bollard post sleeve at each bollard in accordance with sleeve manufacturer's written instructions. Seal bottom of sleeve to bollard post to inhibit removal.

3.4 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 INSTALLING FABRICATED ARCHITECTURAL METAL PANEL SYSTEM

A. Site Verification of Conditions:
   1. Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.
   2. Examine area to receive architectural metal work for compliance with installation clearances.

B. Install in compliance with manufacturer's product data, including product technical bulletins, application and installation instructions.

C. Erect metalwork square, plumb, straight and true.

D. Provide suitable means of anchorage as recommended by manufacturer's written recomendations.

E. Match exposed fastening devices to attached metalwork.

F. Provide components and setting templates to appropriate trades for placement in concrete or masonry.

G. Manufacturer of architectural metal panel system products shall review work involved in handing, installation/application and protection of products and submit written reports in acceptable format to verify compliance of work with contract.

H. Protect installed product's finish surfaces from damage during construction.

I. After installation and prior to final acceptance, inspect metal work for any damage. Repair or replace damaged installed products.

J. Clean installed products in accordance with manufacturer's instruction prior to Substantial Completion. Remove protective coverings.

3.6 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 079500 - EXPANSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior wall expansion control systems.
   2. Interior expansion control systems.

B. Related Requirements:
   1. Section 078446 "Fire-Resistive Joint Systems" for liquid-applied joint sealants in fire-resistive building joints.
   2. Section 079200 "Joint Sealants" for liquid-applied joint sealants and for elastomeric sealants without metal frames.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each expansion control system specified. Include plans, elevations, sections, details, splices, attachments to other work, and line diagrams showing entire route of each expansion control system. Where expansion control systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.

C. Samples for Initial Selection: For each type of expansion control system indicated.
   1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.

D. Product Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
   1. Manufacturer and model number for each expansion control system.
   2. Expansion control system location cross-referenced to Drawings.
   3. Nominal joint width.
   4. Movement capability.
   5. Materials, colors, and finishes.
   6. Product options.
   7. Fire-resistance ratings.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each fire barrier provided as part of an expansion control system, for tests performed by a qualified testing agency.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
   1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where expansion control systems change direction or abut other materials.
   2. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion control systems.

B. Coordination: Coordinate installation of exterior wall expansion control systems with roof expansion control systems to ensure that wall transitions are watertight. Roof expansion joint assemblies are specified elsewhere.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Where indicated, provide expansion control systems with fire barriers identical to those of systems tested for fire resistance per UL 2079 or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Hose Stream Test: Wall-to-wall and wall-to-ceiling systems shall be subjected to hose stream testing.

2.3 EXTERIOR WALL EXPANSION CONTROL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide specified product or products by one of the following:
   1. Balco, Inc.
   2. Watson Bowman Acme Corp.; a BASF Construction Chemicals business.
   3. Comparable products from other manufacturers submitted to and accepted by Architect prior to bidding.

B. Source Limitations: Obtain expansion control systems from single source from single manufacturer.

C. Wall-to-Wall (079500.A20):
   1. General: This seal also occurs at tops of curtain wall as indicated.
   2. Basis-of-Design Product: EMSEAL Corporation; "Colorseal".
   3. Design Criteria:
      a. Nominal Joint Width: As indicated on Drawings.
      b. Movement Capability: -25 percent/+25 percent.
      c. Type of Movement: Thermal.
   4. Type: Preformed cellular foam with weather-resistive facing.
      a. Foam Material: Manufacturer's standard.
      b. Weather Facing Material: Factory-applied and cured silicone.
         1) Color: As selected by Architect from manufacturer's full range.

2.4 INTERIOR EXPANSION CONTROL SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or a comparable product by one of the following:
   1. Balco, Inc.
   2. Construction Specialties, Inc.
   3. JointMaster/InPro Corporation.
   4. MM Systems Corporation.
   5. Nystrom, Inc.
   6. Watson Bowman Acme Corp.; a BASF Construction Chemicals business.

B. Source Limitations: Obtain expansion control systems from single source from single manufacturer.

C. Wall-to-Wall (079500.A06) and (079500.A07):
   1. Basis-of-Design Product: “FWF-200M” by Construction Specialties.
   2. Design Criteria:
      a. Nominal Joint Width: As indicated on Drawings.
      b. Movement Capability: -25 percent/+25 percent, minimum.
      c. Type of Movement: Thermal.
      d. Fire-Rated Assemblies: Where expansion joints occur in fire-rated wall, provide Pyro-Seal as recommended by manufacturer to suit rating and joint design. System shall be UL listed and tested.
   3. Type: Flat Seal.
      a. Metal Retainer: Aluminum.
         1) Finish: Manufacturer's standard.
      b. Seal Material: Aluminum.
         1) Color: Clear Anodized finish.

D. Pre-Formed Cellular Foam Primary Seals (079500.A20):
   1. Basis-of-Design Product: EMSEAL Corporation; "Colorseal".
   2. Design Criteria:
      a. Nominal Joint Width: As indicated on Drawings.
      b. Movement Capability: -25 percent/+25 percent.
      c. Type of Movement: Thermal.

3. Type: Preformed cellular foam.
   a. Foam Material: Manufacturer's standard.
   b. Color: Integral two color system shall provide transition from brick color to metal panel color as selected by Architect from manufacturer's full range.

E. Pre-Formed Cellular Foam Secondary Seals (079500.A23):
1. Basis-of-Design Product: EMSEAL Corporation; "Backerseal".
2. Design Criteria:
   a. Nominal Joint Width: As indicated on Drawings.
   b. Movement Capability: -25 percent/+25 percent.
   c. Type of Movement: Thermal.
3. Type: Preformed cellular foam.
   a. Foam Material: Manufacturer's standard.

2.5 MATERIALS

A. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.

B. Accessories: Manufacturer's standard adhesives, and other accessories compatible with material in contact, as indicated or required for complete installations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces where expansion control systems will be installed for installation tolerances and other conditions affecting performance of work.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to expansion control system manufacturer's written instructions.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.

B. Foam Seals: Install with adhesive recommended by manufacturer.

C. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.

3.4 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion control systems. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION 079500

SECTION 083473 - SOUND CONTROL DOOR ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes metal sound control door assemblies (083473.A01).

B. Related Requirements:
1. Section 087100 "Door Hardware" for hardware associated with sound control door assemblies.
2. Section 099123 “Interior Painting” for field finishing or sound control door assemblies.

1.2 COORDINATION

A. Coordinate installation of anchorages for sound control door assemblies. Furnish setting drawings, templates, and directions for installing anchorages. Deliver sleeves, inserts, anchor bolts, and items with integral anchors to Project site in time for installation.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
1. Review procedures for coordinating frame and anchor installation with wall construction.
2. Review required field quality-control procedures.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include sound ratings, construction details, material descriptions, core descriptions, and finishes.

B. Shop Drawings: For sound control door assemblies.
1. Include elevations of each door design.
2. Include details of sound control seals, door bottoms, and thresholds.
3. Include details of doors, including vertical- and horizontal-edge details and metal thicknesses.
4. Include frame details for each frame type, including dimensioned profiles and metal thicknesses.
5. Include locations of reinforcements and preparations for hardware.
6. Include details of each different wall opening condition.
7. Include details of anchorages, joints, field splices, and connections.
8. Include details of accessories.
9. Include details of moldings, removable stops, and glazing.
10. Include details of conduits and preparations for power, signal, and control systems.

C. Samples for Verification: For each type of exposed finish not less than 3 by 5 inches
1. Doors and Frames: Samples approximately 12 by 12 inches.
a. Doors: Include section of vertical-edge, top, and bottom construction; automatic door bottom or gasket; core construction; glazing; and hinge and other applied hardware reinforcement.
b. Frames: Include profile, corner joint, floor and wall anchors, and seals.

D. Schedule: Provide a schedule of sound control door assemblies prepared using same reference numbers for details and openings as those on Drawings. Coordinate with the Door Hardware Schedule.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and acoustical testing agency.

B. Product Certificates: For each type of sound control door assembly.

C. Product Test Reports: For each sound control door assembly, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranty: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sound control door assemblies 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.

B. Acoustical Testing Agency Qualifications: An independent agency accredited as an acoustical laboratory according to the National Voluntary Laboratory Accreditation Program of NIST.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Avoid the use of nonvented plastic.
   1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of sound control door assemblies that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure to meet sound rating requirements.
      b. Faulty operation of sound seals.
      c. Deterioration of metals, metal finishes, and other materials beyond normal use or weathering.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sound Rating: Provide sound control door assemblies identical to those of assemblies tested as sound-retardant units by an acoustical testing agency, and have the following minimum rating:
   1. STC Rating: As indicated below as calculated by ASTM E 413 when tested in an operable condition according to ASTM E 90.
      a. For 3 feet wide doors: Not less than STC of 51.
      b. For 4 feet wide doors: Not less than STC of 53.
      c. For pairs of doors: Not less than STC of 51.

2.2 STEEL SOUND CONTROL DOORS

A. Basis-of-Design Products: Subject to compliance with requirements, provide Wenger; “Acoustical Steel Doors” with large vision lites or a comparable product by one of the following manufacturers.
   1. Overly Door Company.
   2. Krieger Specialty Products.
   3. Comparable products from other manufacturers meeting specified requirements will be considered, when submitted to and accepted by Architect prior to bidding.

B. Source Limitations: Obtain pre-engineered steel sound control door assemblies, including doors, frames, sound control seals, hinges, thresholds, glazing, and other items essential for sound control, from single source from single manufacturer.

C. Doors: Flush-design sound control doors, 1-3/4 inches thick thickness, unless thicker door is required to provide STC rating; of seamless construction; with manufacturer's standard sound-retardant core as required to provide STC rating indicated. Construct doors with smooth, flush surfaces without visible joints or seams on exposed faces or stile edges. Fabricate according to NAAMM-HMMA 865.
   1. Interior Doors: Fabricate from cold-rolled steel sheet unless otherwise indicated, 0.067-inch (14 gauge) nominal thickness or thicker as required to achieve STC rating indicated.
   2. Core: Manufacturer's standard sound control core.
   3. Loose Stops for Glazed Lites in Doors: Same material as face sheets.
   4. Top and Bottom Channels: Closed with continuous channels of same material as face sheets, spot welded to face sheets not more than 6 inches o.c.
   5. Hardware Reinforcement: Same material as face sheets.

D. Materials:
   1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
   2. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
   3. Glazing: As required by sound control door assembly manufacturer to comply with sound control requirements.

E. Finishes:
   1. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
      a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.3 SOUND CONTROL FRAMES

A. Frames: Fabricate sound control door frames with corners mitered, reinforced, and continuously welded the full depth and width of frame. Fabricate according to NAAMM-HMMA 865.
   1. Weld frames according to NAAMM-HMMA 820.
   2. Interior Frames: Fabricate from cold-rolled steel sheet unless otherwise indicated, 0.067-inch (14 gauge) nominal thickness or thicker as required to provide STC rating indicated.
   3. Hardware Reinforcement: Fabricate according to NAAMM-HMMA 865 of same material as face sheets.
   4. Head Reinforcement: Metallic-coated steel channel or angle stiffener, 0.108-inch nominal thickness.
   5. Jamb Anchors:
      a. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.064-inch nominal-thickness metallic-coated steel with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.156 inch thick.
      b. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.048-inch nominal-thickness uncoated steel unless otherwise indicated.
      c. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter, metallic-coated steel bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
   6. Floor Anchors: Not less than 0.079-inch nominal-thickness metallic-coated steel, and as follows:
      a. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
      b. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.
   7. Ceiling Struts: Minimum 3/8-inch-thick by 2-inch-wide uncoated steel unless otherwise indicated.

B. Materials:
   1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
   2. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
   3. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.
   4. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M or ASTM F 2329.
   5. Powder-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 sound control door frames of type indicated.

6. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers.

C. Finishes:
1. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.4 HARDWARE

A. Sound Control Door Hardware: Manufacturer's standard sound control system, including head and jamb seals, door bottoms, cam-lift hinges, and thresholds, as required by testing to achieve STC rating indicated.
1. Head and Jamb Seals:
a. Magnetic Seals: One-piece units consisting of closed-cell sponge neoprene seal and resiliently mounted magnet held in place by metal retainer, with retainer cover of same material as door frame; attached to door frame with concealed screws.
2. Door Bottoms: Neoprene or silicone gasket held in place by metal or fiberglass housing; mortised into bottom edge of door.
3. Cam-Lift Hinges: Continuous, full-mortise template type that raises door 1/2 inch when door is fully open; with hardened pin; fabricated from stainless steel.
4. Thresholds: Flat, smooth, unfluted type as recommended by manufacturer; fabricated from stainless steel.
a. Finish: No. 4 satin finish.
5. Removable Mullion: At pairs of doors, provide manufacturer's standard removable mullion, equipped with tamper-resistant fasteners.

B. Other Hardware: Comply with requirements in Section 087100 "Door Hardware."

2.5 SOUND CONTROL ACCESSORIES

A. Glazing: Manufacturers' standard 3/8 inch laminated, factory-installed, safety glazing.

B. Grout: Comply with ASTM C 476, with a slump of not more than 4 inches as measured according to ASTM C 143/C 143M.

C. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.6 FABRICATION

A. Steel Sound Control Door Fabrication: Sound control doors 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.
1. Seamless Edge Construction: Fabricate doors with faces joined at vertical edges by welding; welds shall be ground, filled, and dressed to make them invisible and to provide a smooth, flush surface.
2. Glazed Lites: Factory install glazed lites according to requirements of tested assembly to achieve STC rating indicated. Provide fixed stops and moldings welded on secure side of door.
3. Hardware Preparation: Factory prepare sound control doors to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping.
a. Reinforce doors to receive nontemplated mortised and surface-mounted door hardware.
b. Locate door hardware as indicated, or if not indicated, according to NAAMM-HMMA 831, "Recommended Hardware Locations for Custom Hollow Metal Doors and Frames."
4. Tolerances: Fabricate doors to tolerances indicated in NAAMM-HMMA 865.

B. Sound Control Frame Fabrication: Fabricate sound control frames 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.
1. Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated from same thickness metal as frames.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

3. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
4. Jamb Anchors: Provide number and spacing of anchors as follows:
    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
        1) Two anchors per jamb up to 60 inches in height.
        2) Three anchors per jamb from 60 to 90 inches in height.
        3) Four anchors per jamb from 90 to 96 inches in height.
        4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches, or fraction thereof, more than 96 inches in height.
    b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
        1) Three anchors per jamb up to 60 inches in height.
        2) Four anchors per jamb from 60 to 90 inches in height.
        3) Five anchors per jamb from 90 to 96 inches in height.
        4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches, or fraction thereof, more than 96 inches in height.
        5) Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
    c. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
5. Head Reinforcement: For grouted frames more than 48 inches wide, weld continuous head reinforcement to back of frame at head full width of opening.
6. Hardware Preparation: Factory prepare sound control frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping.
    a. Reinforce frames to receive nontemplated mortised and surface-mounted door hardware.
    b. Locate hardware as indicated, or if not indicated, according to NAAMM-HMMA 831, "Recommended Hardware Locations for Custom Hollow Metal Doors and Frames."
7. Plaster Guards: Weld guards to frame at back of hardware cutouts and glazing-stop screw and sound control seal preparations to close off interior of openings in frames to be grouted.
8. Tolerances: Fabricate frames to tolerances indicated in NAAMM-HMMA 865.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Examine roughing-in for embedded and built-in anchors to verify actual locations of sound control door frame connections 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 sound control door frames to the following tolerances:
1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

C. Drill and tap doors and frames to receive nontemplated mortised and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install sound control door assemblies plumb, rigid, properly aligned, and securely fastened in place; comply with manufacturer's written instructions.

B. Frames: Install sound control door frames in sizes and profiles indicated.
   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. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, and dress; make splice smooth, flush, and invisible on exposed faces.
      b. Install sound control frames with removable glazing stops located on secure side of opening.
      c. Remove temporary braces only after frames or bucks have been properly set and secured.
      d. Check squareness, twist, and plumbness of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
      e. Apply corrosion-resistant coating to backs of frames to be filled with mortar, grout, and plaster containing antifreezing agents.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
      a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
   3. Metal-Stud Partitions: Fully fill frames with mineral-fiber insulation.
   4. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
   5. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
   6. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
   7. Grouted Frames: Solidly fill space between frames and substrate with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
   8. Installation Tolerances: Adjust sound control door frames for squareness, alignment, twist, and plumbness to the following tolerances:
      a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
      c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

C. Doors: Fit sound control doors accurately in frames, within clearances indicated below. Shim as necessary.
   1. Non-Fire-Rated Doors: Fit non-fire-rated doors accurately in frames with the following clearances:
      a. Jambs: 1/8 inch.
      b. Head with Butt Hinges: 1/8 inch.
      c. Head with Cam-Lift Hinges: As required by manufacturer, but not more than 3/8 inch.
      d. Sill: Manufacturer's standard.
      e. Between Edges of Pairs of Doors: 1/8 inch.

D. Sound Control Seals: Where seals have been factory prefit and preinstalled and subsequently removed for shipping, reinstall seals and adjust according to manufacturer's written instructions.

E. Cam-Lift Hinges: Install hinges according to manufacturer's written instructions.

F. Thresholds: Set thresholds in full bed of sealant complying with requirements in Section 079200 "Joint Sealants."

G. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with sound control door assembly manufacturer's written instructions.
   1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 FIELD QUALITY CONTROL

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

B. Testing Services: Perform testing for verification that assembly complies with STC rating requirements.
   1. Acoustical testing and inspecting agency shall select two (1 single and 1 pair) of sound control door(s) at random from sound control door assemblies that are completely installed for testing.
   2. Field tests shall be conducted according to ASTM E 336, with results calculated according to ASTM E 413. Acceptable field NIC values shall be within 5 dB of laboratory STC values.
   3. Inspection Report: Acoustical testing agency shall submit report in writing to Architect and Contractor within 24 hours after testing.
   4. If tested door fails, replace or rework all sound control door assemblies to bring them into compliance at Contractor's expense.
      a. Additional testing and inspecting at Contractor's expense will be performed to determine if replaced or additional work complies with specified requirements.

C. Prepare test and inspection reports.

3.5 ADJUSTING AND CLEANING

A. Final Adjustments: Check and adjust seals, door bottoms, and other sound control hardware items right before final inspection. Leave work in complete and proper operating condition.

B. Remove and replace defective work, including defective or damaged sound seals and doors and frames that are warped, bowed, or otherwise unacceptable.
   1. Adjust gaskets, gasket retainers, and retainer covers to provide contact required to achieve STC rating.

C. Grouted Frames: Clean grout off sound control door frames immediately after installation.

D. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible, rust-inhibitive, air-drying primer.

END OF SECTION 083473

SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes aluminum windows for exterior locations indicated on Drawings to be replaced under Alternate 1.

B. Related Requirements:
1. Section 084113 "Aluminum-Framed Entrances and Storefronts" for coordinating finish among aluminum fenestration units.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchorage, flashing, sealing perimeters, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

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:
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: Furnish two samples, not less than 2 by 6 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. Field quality-control reports.

C. 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. Field Sample: Build field sample to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build field sample of typical wall area as shown on Drawings and in a location coordinated with Architect.
2. Approval of field sample does not constitute approval of deviations from the Contract Documents contained in field sample 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.

1.6 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: Two years from date of Substantial Completion.
      b. Glazing Units: 10 years from date of Substantial Completion.
      c. Aluminum Finish: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide EFCO Corporation; a Pella company; “Series 2700 - 2 inch Heavy Commercial Projected Window” or a comparable product by one of the following
   1. Kawneer North America; an Alcoa company;
   2. Tubelite;
   3. Wausau Window and Wall Systems.

B. Source Limitations: Obtain aluminum windows from single source from single manufacturer.

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.
   1. Window Certification: AMMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
   1. Minimum Performance Class: AW.
   2. Minimum Performance Grade: 50.

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.35 Btu/sq. ft. x h x deg F.

D. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 52 for frame.

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. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.30.

2.3 ALUMINUM WINDOWS

A. Operating Types: Provide the following operating types in locations indicated on Drawings:
   1. Match operation of existing windows.

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. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.
   1. Kind: Fully tempered where indicated on Drawings.

D. Insulating-Glass Units: ASTM E 2190.
   1. Basis of Design: "VE-12M" by Viracon or comparable product from a different manufacturer with the following product characteristics.
   2. Glass: ASTM C 1036, Type 1, Class 1, q3.
      a. Tint: Clear (interior lite) and Match Existing (exterior lite)
      b. Kind: Fully tempered where indicated on Drawings.
   3. Lites: Two.
   4. Filling: Fill space between glass lites with air.
   5. Low-E Coating: Sputtered on second or third surface.

E. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel 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. Projected Window Hardware:
   1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
      a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.
   2. Hinges: Non-friction type, not less than two per sash.
   3. Lock: As selected by Architect from manufacturer's full range of options..
   4. Limit Devices: Concealed support arms with adjustable, limited, hold-open limit devices designed to restrict sash opening.
      a. Limit clear opening to 4 inches for ventilation; with custodial key release.

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. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

2.5 INSECT SCREENS

A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
   1. Type and Location: Half, outside for single-hung sashes.

B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
   1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.

C. Aluminum Wire Fabric: 18-by-16 mesh of 0.011-inch- diameter, coated aluminum wire.
   1. Wire-Fabric Finish: As selected by Architect from manufacturer's standard range.

2.6 FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows, including the following:
   1. Angled mullion posts with interior and exterior trim.
   2. Angled interior and exterior extension and trim.
   3. Exterior head and sill casings and trim.

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. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design wind loads of window units.

G. 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.

2.7 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.

2.8 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

C. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   1. Color and Gloss: As selected by Architect from manufacturer's full range.

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: 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. Water-Resistance Testing:
      a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
      b. Allowable Water Infiltration: No water penetration.
   3. Testing Extent: Three windows of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured.
   4. Test Reports: Prepared according to AAMA 502.

C. Remove and replace noncomplying windows and retest as specified above.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

E. Prepare test and inspection reports.

3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
   1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 085113

SECTION 114000 - FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the furnishing of material and labor required to completely erect all food service equipment as specified herein and indicated on drawings. This work is to be performed in such a manner as to complete the installation of each individual piece of equipment to perform the function for which it is designed.

B. The work referred to in these documents consists of furnishing all labor and materials required to deliver all equipment hereinafter specified into the building, uncrate, assemble, hang, set-in-place, level and completely install exclusive of rough-in and all electrical, ventilation and plumbing connections.

C. For required drain traps, steam traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete mechanical hookup of food service equipment, refer to the specifications governing other trades. Disconnecting existing equipment to be removed, rough-in and connections will be completed by the Owner.

D. For wiring, disconnects, and other materials necessary to complete electrical hookup of food service equipment, refer to the Architect's specifications governing other trades. Rough-in and connections are included under other Contractor's work.

E. Related Responsibilities to be Completed by Other Trades:

1. Exhaust hood/condensate ducts and their installation, ductwork, fans, curbs, etc., and air balancing.
2. Furnishings and installation of plumbing fixtures as indicated (i.e., mop sink, hand sink, etc.).
3. Installation of food service equipment accessories included, but not limited to:

a. Booster Heater:

1)Two (2) temperature/pressure gauges.

2)One (1) pressure reducing valve.

3)Connection of incoming hot water through booster and tee to dish machine fill.

4)Extending of copper drain line from pressure relief to nearest floor drain.

b. Dish Machine:

1) Connection of incoming water from booster heater.

2) Install final rise temperature gauge.

3) Connection of main drain and also rinse tank overflow to appropriate drain.

c. Disposal Scrapping System:

1) Connection from supply to hot and cold temperature mixing valve.

2) Combining disposal and tank reservoir drains prior to connection to waste system.

3) Mounting and interpiping of trough diffuser and gusher head(s).

4) Mounting prerinse faucet and connecting supply lines.

d. Preparation/Scullery Sinks:

1) Mounting of faucets and connection of supply lines to the faucet(s).

2) Mounting of 2" lever waste drains and extension of drain and trap to indirect waste.

e. Hot and Cold Food Tables:

1) Extension of 1" IPS drain to nearest floor drain.

f. Steamers/Combi Ovens/Steam Kettles:

1) Connect boiler supply through water filtration system.

2) Extend air gap drain(s) from boiler blow down or kettle drain(s) to floor sink.

g. Walk-In Refrigeration:

1) Extend copper drain line form evaporator to nearest floor drain. Refer to mechanical specs.

2) Connect incoming water to water cooled condensing units (if applicable) and extend drain line to nearest floor drain.

4. Installation of Owner-supplied items.

5. Ceiling grid within the Dishroom area shall be installed as to accommodate two (2) 4" x 16" condensate ducts allowing penetrations through ceiling tiles and not through grid.

a. Cutting of ceiling tiles to accommodate two (2) 4" x 16" condensate ducts and stainless steel collar trim.

6. Review of food service equipment shop drawings and equipment submittals for necessary items for a complete utility connection/hook-up.

1.2 SUBMITTALS

A. General: Submit the following within thirty (30) days of Contract Award.

1. Utility Requirement Drawings: Submit a minimum of six (6) legible blueline prints of the 1/4" scale dimensioned utility rough-in plans. These shall be "rough-in" plans, not "point-of-connection" plans and shall show plumbing, electrical and mechanical requirements. Include in these plans all utilities for any re-used existing equipment called for in these specifications. Drawings shall be submitted rolled within a mailing tube fully protected for shipment. After approval this Contractor shall print the number of prints as required for distribution.

2. Product Data: Submit six (6) sets of bound brochures or specification sheets of standard items of equipment to be used on the project. The brochures or specifications sheets shall be properly labeled and marked with item number, quantity, electrical wiring, accessories, finish, etc. Should the Contractor require sets to be returned to him, the above quantity should be increased accordingly.

3. Shop Drawings: Submit a minimum of six (6) legible blueline prints of all custom fabricated equipment, walk-in refrigerators and/or freezers, exhaust hoods, conveyor systems, etc. The plan view and elevations shall be drawn at 1"=1'-0" scale with sections at 1-1/2"=1'-0" and special details at 3"=1'-0". Drawings shall be submitted rolled within a mailing tube fully protected for shipment. After approval, this Contractor shall print the number of prints as required for distribution.

B. Rough-In Verification Letter: Before the concrete floor slabs are poured in areas containing food service equipment, the General Contractor shall submit, to the Architect-Engineer, a letter from the Food Service Equipment Contractor stating that he has visited the site and confirmed that the location and size of all mechanical and electrical rough-ins are installed as required for equipment specified herein.

C. Project Closeout Submittals: Submit three (3) bound sets of maintenance and service manuals covering each item of food service equipment. This submittal shall include product data sheets, wiring diagrams, parts list and service agency.

1.3 QUALITY ASSURANCE

A. Manufacturers' Qualifications: Firms regularly engaged in the manufacture of food service equipment of types, capacities, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 projects.

B. Contractors' Qualifications: Shall be firms regularly engaged in contracting for food service installations. They shall have successfully completed at least ten projects of similar size and magnitude as this project. They shall have the technical personnel to handle all phases of the work. They shall be able to demonstrate their financial ability to handle this project to the Owner's satisfaction.

C. Fabricators' Qualifications: Shall be firms regularly engaged in the manufacture of custom-built food service equipment, and who have a complete factory with suitable equipment, personnel and engineering facilities to properly draw, detail and manufacture the highest quality of food service equipment. All items of custom-built equipment shall be fabricated by one fabricator. The workmanship shall be of the highest quality throughout and in accordance with the best accepted practices for this type of equipment.

D. Installers' Qualifications: Shall be a firm regularly engaged in food service equipment installations who has successfully completed installations of the same size and magnitude. Firm shall have expertise in field-welding and finishing, as well as being able to field-adjust equipment to fit the project field conditions.

E. Codes and Standards:

1. Building Codes: The work shall comply with the local building codes.

2. NSF Standards: The work as included under this Contract as being special-fabricated equipment shall conform to the National Sanitation Foundation Standards No. 1 and No. 2, and revisions thereafter as established by the National Sanitation Foundation, Ann Arbor, Michigan. The pieces of fabricated equipment shall be properly marked with the seal as supplied by NSF, and applied to the equipment before delivery to the project site.

3. Underwriters Laboratories: Where available, provide UL labels on prime electrical components of food service equipment. Provide UL "recognized marking" on other items of electrical components, signifying listing by UL, where available.

4. NEMA Standards: All electric-operated and/or heated equipment fabricated or otherwise shall conform to the latest standards of the National Electrical Manufacturer's Association.

5. ANSI Standards: Comply with applicable ANSI standards for electric-powered and gas-burning appliances, for piping to compressed-gas cylinders, and for plumbing fittings including vacuum breakers and air gaps to prevent siphonage in water piping.

6. NFPA Codes: Install food service equipment in accordance with the following National Fire Protection Codes (NFPA):

   a. NFPA 54 - National Fuel Gas Code.

   b. NFPA 70 - National Electrical Code.

   c. NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.

7. ASME Boiler Code: Construct steam-generating and closed steam-heating equipment to comply with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; Section IV for units not exceeding 15 psi or 250 deg F (121 deg C), or Section 1 for higher pressure/temperature units.

8. American Gas Association Standards: All items of gas burning equipment shall be designed for operation with the gas available and shall be listed as approved by the American Gas Association.

F. It is the purpose of these plans and specifications to purchase for the Owner, food service equipment, both specially-fabricated items and items of general manufacture, that conform to the best existing policies of the industry. These items have been selected as preferred items as a result of past experiences in functional design, construction, material and in maintenance and repair. If a Contractor elects to quote upon a substitute not specified , he will be permitted to do so provided that he lists these substitutions on a separate sheet of paper, outlining them as an addition or deduction to the specified brand shown on the specifications. Contractor will be required to submit his base proposal on the equipment specified in the specifications. Any Contractor offering such an alternate bid shall accompany his alternate sheet with complete construction details, brochures and comparison sheets to the equipment specified. The Owner and Architect, reserve the right to accept or reject such substitute bids.

G. The specifications and drawings are complementary, and what is called for by one shall be as binding as if called for by both. Contractor shall examine the plans and specifications to be fully satisfied as to the conditions of the project. No allowance shall be subsequently made to the Contractor by reason of error on his part or obvious oversight not called to the attention of the Food Service Consultant.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver food service equipment in containers designed to protect equipment and finish until final installation. Make arrangements to receive equipment at project site or to hold in warehouse until delivery can be made to jobsite.

B. Store food service equipment in original containers and in location to provide adequate protection to equipment while not interfering with other construction operations.

C. Handle food service equipment carefully to avoid damage to components, enclosures, and finish. Do not install damaged food service equipment; replace and return damaged components to equipment manufacturer.

1.5 PROJECT CONDITIONS

A. General: Take field measurements to assure accurate fit of fabricated equipment. Fabricated equipment is to be built to fit out-of-square corners and to fit out-of-plumb walls.

B. Check and verify all rough-ins. Should the rough-ins not agree with the previously submitted and approved dimensioned rough-in plans, then this Contractor shall have the rough-in moved or notify the Architect and Food Service Consultant of the error.

C. Check electrical characteristics and water, steam, and gas pressure. Provide pressure-regulating valves where required for proper operation of equipment.

1.6 WARRANTY

A. Equipment Warranty: Provide a warranty of all equipment both special fabricated and regular manufactured items against defective material and failure to perform as required provided user has followed the manufacturer's instructions for use. This period of warranty shall be for one (1) year from date of partial occupancy.

B. Special Project Warranty: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, refrigeration compressors with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required, provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. This warranty shall be in addition to, and not a limitation of, the rights the Owner may have against the Contractor under the Contract Documents.

1. Warranty Period: Five (5) years from date of partial occupancy.

C. Refrigeration Service Policy: All self-contained or remote refrigeration systems furnished under this Contract shall include start-up, testing and temperature adjustment. Each system shall have a one (1) year refrigeration service policy maintained on a local level and shall include all labor, material, refrigerant and mileage.

PART 2 - PRODUCTS

2.1 GENERAL

A. The material to be used in the manufacturing of equipment shall be as hereinafter specified. Material that is not definitely specified shall be of the best quality used for its specified or intended purpose. All materials shall be new and free from all defects and imperfections.

B. All fabricated equipment in this specification shall be custom-built by a fabricator who has a complete factory with suitable equipment, personnel and engineering facilities to properly design, detail and manufacture the highest quality of food service equipment. All items of custom-built equipment shall be fabricated by one manufacturer. The workmanship of all equipment shall be of the highest grade throughout and in accordance with the best practice recognized for this type of equipment.

2.2 STANDARDS

A. Where specified, items of gas burning equipment shall be designed for operation with the type and pressure of gas available. Each items shall be listed as approved by the American Gas Association (AGA) and shall comply with State and Local Codes.

B. Where specified, items of equipment that are electrically-operated and/or heated, either fabricated or otherwise, shall conform to current applicable standards of the National Electric Code, the National Electrical Manufacturer's Association (NEMA), the Underwriters Laboratories, Inc. (UL), and the State and local codes where standards have been established by those agencies.

C. Where specified, steam-operated and/or heated equipment shall be of a type and design that has been approved by the American Society of Mechanical Engineers (ASME).

D. All special-fabricated equipment shall conform to the current standards of the National Sanitation Foundation (NSF), Ann Arbor, Michigan. All fabricated equipment shall bear the NSF seal applied before delivery to the project site. Prior approval by the Food Service Consultant shall be obtained on any exceptions.

E. All metal used in the construction of this equipment shall be of the thickness as specified by gauge. The gauge shall be the United States Standard as measured by the Starrett gauge.

F. Each item of equipment shall be appropriately labeled with only the manufacturer's name, model number, and serial number. All labels shall be mounted in an inconspicuous but accessible location.

G. Each item of standard manufactured equipment shall be the current model at the time of deliver.

2.3 MATERIALS

A. Stainless Steel:

1. All stainless steel used in the construction of this equipment shall be of Type #302, or standard analysis 18-8 containing a minimum of 17-19 percent chromium, 8-10 percent nickel and 0.08-0.20 percent carbon.

2. Fractures or mill reject sheets that are not uniform in color and finish shall not be used in this equipment. Sheet color and finish, whether mill or shop-finished, shall be uniform throughout and shall have uniform finish and appearance.

B. Galvanized Metal:

1. All galvanized metal used in the construction of this equipment shall be copper-bearing galvanized steel sheets of an approved grade, rerolled for smoothness.

C. Finishing:

1. All exposed stainless steel shall be polished to a #180 grit, or a #4 finish.

2. All metals used in the special-fabricated equipment, other than those specified to be stainless steel, are to be finished in a spray-on-epoxy, completely primed with proper primer, formulated for epoxy finish on metal. The epoxy is to be in color to be selected, with sample submitted for approval before application to the equipment.

3. Wherever metal is depressed, such as a result of welding, the depression shall be hammered out flush with adjacent surfaces.

4. Wherever discoloration of stainless steel occurs as result of welding, etc., the discoloration shall be polished out completely and the grain restored.

5. Sheared edges shall not be sharp and shall be without burrs and projections.

6. Wherever brake marks occur, they shall be polished out. Where cracks in stainless steel occur as a result of brakes, the cracks shall be completely welded closed, ground smooth and polished to the original finish.

D. Welding:

1. All welding of stainless steel whether specifically specified or implied shall be accomplished by the arc-welding (heli-arc) method using stainless steel rods of the same composition as the parts being welded. Welds shall be free of pits or flaws and peened to remove flux and other impurities. Welds shall be ground smooth and polished to the original finish of the metal, with the grain uniform to the grain of the original

sheet. Where grinding and polishing has destroyed the grain, restore and blend to obliterate all traces of welding. All welds, whether exposed or concealed on unpolished surfaces, shall be ground back to the surface of the original metal.

2. All welding of galvanized steel whether specifically specified or implied shall be accomplished by the arc welding (heli-arc) method using bronze rods. Welds shall be free of pits or flaws and peened to remove flux and other impurities. Welds shall be ground to the surface of the original metal and regalvanized.

3. Acetylene welding will not be accepted.

4. Solder will not be accepted unless specifically specified and approved.

5. Field joints and joints in counter and table tops are to be arc-welded (heli-arc), ground and polished smooth. Where field joints are necessary for moving equipment into proper location, the field joints are to be welded, ground and polished smooth at the project site and shall be a part of installation.

E. Bolts, Screws, and Rivets:

1. Bolts, screws and rivets in exposed surfaces will be unacceptable.

2. Whenever bolts, or screws are used to fasten paneling or trim or permanent components of counters or cabinets together, they shall be of an approved type.

3. Where stud bolts are used to fasten table tops, etc., to base frames or bodies, the stud bolts shall not extend past the nut more than 1/4".

4. All bolts, screws or rivets shall be of the same composition as metal to which they are fastened.

F. Pitch and Drainage:

1. Whenever a fixture has a waste or drain outlet, the surfaces shall have a distinct pitch toward such outlet.

G. Sealing:

1. Wherever required, the sealing of backsplashes to walls, to cabinet bodies, to concrete or tile bases, roll-in refrigerators to floors or other types of application, the adhesive sealant shall be Dow Corning Corp. silicone, in either clear or approved color to match the surrounding surfaces.

2.4 FABRICATED PRODUCTS

A. Pipe Stands and Frames: Fabricate pipe stands and frames from stainless steel tubing. Legs shall be constructed from 1-5/8" diameter tubing and cross rails from 1-1/4" diameter tubing. Locate cross rails with centerlines 10" above floor. Anchor legs to closed gussets at the tops only. Provide cross rails at all pipe stands, except omit front cross rails at sinks and other locations as specified. Finish off pipe leg bottoms smoothly and overlap stems of feet resulting in a sanitary fitting preventing the accumulation of grease or other foreign matter.

B. Feet At Pipe Stands: Shall be sanitary die stamped stainless steel, bullet shaped feet, fully enclosed, with slightly rounded bottoms. Fit the tops of these feet with male threaded stems to fit into the pipe legs and provide 1" of adjustment. Stems shall be extra long so threads are not exposed.

C. Table Tops: Shall be stainless steel with horizontal and vertical interior corners coved on 5/8" radius. Turn tops straight down 1-3/4", with ½" 45 deg toe-in, except where adjacent to walls or other pieces of equipment. Turn wall side up 6", back 2" at a 45 deg angle, and down ½" unless shown or specified otherwise. Weld shop seams and corners, grind smooth, and polish. Reinforce working tops on the underside with a framework of galvanized 4" channels leaving 1" legs. Place cross angle members at each pair of legs and additional cross angle members between legs on approximately 24" centers. Provide one angle runner, running lengthwise, on

the tops up to 30" wide; two shall be provided on tops over 30". Reinforce tops so there is not any noticeable deflection with reinforcements stud welded to underside of top. No rivets or bolts shall be used through the top. Sound deaden the top of bracing with mastic, at contact locations with the underside of tops.

D. Dish Table Tops: Construct dish table tops of stainless steel with free edges turned up 3" and finished with die formed sanitary rolled rim. Sides adjacent to walls or higher fixtures shall have a 8" high x 2" thick backsplash, with the top turned back at a 45 deg angle. Interior horizontal and vertical corners shall be coved on a 5/8" radius, and outside radius of rolled rim corners shall be concentric with inside cove. Close the ends of splash. Free corners of tops shall be spherical. Reinforce dish table tops with stainless steel channel bracing and sound deaden the top of bracing with mastic, at contact locations with the underside of tops.

E. Drawers: Die stamp drawer bodies from one piece of stainless steel, size as shown or specified. Top edges of drawer shall be flanged out ½". Interior horizontal corners shall be e rounded on a 1" radius. Drawer body shall set in channel frame so it can be removed for cleaning. Drawer face shall be stainless steel flat face, with formed handle. Weld drawer face to supporting channel frame, and fit with steel ball bearing rollers. Furnish adjustable stops on each drawer. Enclose drawers on open base tables in 16 ga housing to make vermin proof.

F. Undershelves: In open base tables, shall be solid stainless steel, made in stationary or removable sections as indicated, with rolled down edges on sides overlapping pipe cross rails where they abut same. Turn down abutting sections of shelves 1" straight. Stationary undershelves shall have all edges formed down 1-1/2" and then back ½" on a 30 deg angle. Shelves shall be notched neatly around legs and welded integrally and continuously to the legs. Undershelving shall be braced sufficiently to assure a flat rigid surface.

G. Sinks: Shall be 38" high at top of front edge and 47" high a top of backsplash, with length and depth as shown or specified. Fabricate sink from stainless steel with backs, bottoms, and fronts formed from one continuous sheet with ends welded in place. Form partitions for multiple compartment sinks from continuous stainless steel with the top of partition ground, polished, and ends with continuously welded in place. Top edges of sinks at front and ends, except where fitted with integral drainboards, shall have die formed integral sanitary semi rill rims. Cove vertical and horizontal corners to a 5/8" radius. Mount sinks on pipe stands. Unless shown or specified otherwise, sink backs and ends at walls or high fixtures shall have 12" high x 2" thick backsplashes, with tops turned back at a 45 deg angle and ends enclosed. Provide two (2) faucet holes on 8" centers over the centerlines of partitions between compartments, 2-1/2" down from the top of the backsplash.

H. Sink Inserts: Shall be one piece deep drawn stainless steel construction. Weld sinks integral with countertops with no lap between. Sizes are a shown or specified.

I. Sink Drainboards: Shall be of stainless steel and welded integral to sinks. Drainboards shall have 2" high rims with die formed integral rolled edges to match sink edges. Cove horizontal and vertical corners to a 5/8" radius. Solder filleting of these corners is not accepted. Pitch drainboards to properly drain into sink. Unless shown or specified otherwise, drainboards shall have backsplashes at backs and ends against walls or high fixtures. Reinforce drainboards with stainless steel channel bracing. Sound deaden the top of bracing with mastic, at contact locations with the underside of drainboards. Backsplashes shall match backsplashes at sinks and be welded integral with splash of sink compartments with ends enclosed.

2.5 REFRIGERATION EQUIPMENT

A. General: Remote refrigeration systems shall conform to the following specifications. Condensing units shall be factory assembled, piped, wired, tested and run. Condensing units shall be mounted on a metal frame and shall include semi-hermetic motor compressors with built-in thermal overload, suction and discharge stop valves, oil sight glass, and suction and discharge line vibration isolators as required, factory installed and braced. Units shall have an air cooled condenser with copper tubes and aluminum fins arranged for horizontal air flow with direct driven propeller fans and motors with built-in overload protection. Units shall also be equipped with a refrigerant receiver with purge, charge and relief valves with seal caps.

B. Evaporator units shall be as specified and shall be ceiling suspended with nylon bolts and mounted as shown on drawings. The evaporator housing shall protect the refrigerant piping against damage. The evaporator shall be mounted to assure complete drainage from defrost or the refrigerant piping. Fan guards shall be supplied and shall be OSHA approved.

C. Control of each refrigeration system shall be by automatic recycling pump down cycle by means of a solenoid valve in the liquid line of each system operating by a thermostat with remote bulb in the return air to an evaporator unit. The thermostat shall be suitable for use within the refrigerated space.

D. Piping of refrigerant and condensate piping shall be copper tubing, hard drawn, Type "L", ACR nitrogen filled and sealed. Fittings for refrigerant lines shall be forged or wrought copper, assembled using silver solder. The suction lines shall be sized to give a maximum pressure drop from the condensing unit to the evaporator unit of two pounds for medium temperature systems and shall allow gas velocities of not less than 750 ft per minute in horizontal runs and 1,500 ft per minute in vertical risers. Liquid lines shall be sized to give a maximum pressure drop of 3 lbs from receiver to the evaporator units.

E. Furnish and install adjustable hangers, anchors, or straps for all refrigerant piping. Hangers shall be spaced not to exceed 10 ft on centers and closer where required for the expansion and contraction of pipe lines. Hangers shall permit screw adjustment after erection of the piping. Insulated refrigerant lines shall be provided with approved protective sleeves at hanger points.

F. All refrigerant suction lines shall be insulated back to the condensing units with Armstrong Armaflex foamed plastic insulation with flame spread rating of 25 or less and smoke developed rating of 50 or less as tested by ANSI/ ASTM E 84 (NFPA 255) method. Insulation shall be applied in accordance with the manufacturer's directions. The minimum thickness of the insulation on refrigerant piping shall be ½" for medium temperature units and 3/4" for low temperature units. All insulation that is outdoors and exposed shall be covered completely with plastic sleeving secured and sealed in place.

G. After refrigerant piping has been run, but before it is insulated, each system shall be run and tested for leaks. If there are no leaks, then the Contractor shall connect a rotary vacuum pump to the gauge port of the compressor discharge service valve with copper tubing or vacuum hose if not less than 3/8" diameter. With the compressor suction and discharge valves open, the vacuum pump shall be operated until a vacuum of 1,500 microns absolute is obtained. The vacuum shall then be broken with dry nitrogen and the system evacuated again to 1,500 microns. The vacuum shall again be broken with dry nitrogen and a third evacuation to 500 microns or deeper shall be made. The motor compressor shall not be operated while the system is under a vacuum and shall not be used as a vacuum pump to evacuate the system. The Contractor shall then charge each system. The Contractor shall charge each system with the correct type and amount of refrigerant as shown in the manufacturer's instructions. The motor compressor must be operating while the charging is being done.

H. The start-up, testing and placing into operation of this equipment shall be supervised by a qualified Refrigeration Installer.

I. All equipment shall be warranted against defects in workmanship and material and all repairs and replacement which may become apparent and necessary by reason of such defects during the first year after final completion and acceptance of the equipment installation will be made by the Contractor at his own cost and expense and without charge to Owner. All repairs and replacements shall be made at a time and during hours satisfactory to the Owner.

J. All self-contained or remote refrigeration systems furnished under this Contract shall include start up and testing and temperature adjustment. The systems shall have a one (1) year guarantee and a one (1) year refrigeration service policy. The service policy shall be maintained on a local level and shall include all labor, material, refrigerant, and mileage.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Field Measurements: Verify dimensions before fabrication as required at all equipment locations. When checking measurements at jobsite, carefully examine existing conditions and report to the General Contractor any work performed and planned which would prevent execution of this work. Notify the Architect and General Contractor of such conditions in writing before proceeding.

B. Mechanical and Electrical Rough-Ins: Examine roughed-in mechanical and electrical services, and installation of floors, walls, columns and other conditions under which the work is to be installed. Notify the General Contractor of unsatisfactory conditions for proper installation of food service equipment.

1. Visit the job site to check mechanical and electrical rough-ins, prior to the installation of concrete floor.

2. Cost to relocate or add utility lines due to the failure of the Equipment Subcontractor to indicate their proper location on the rough-in shop drawings, will be assumed by the General Contractor.

C. Thoroughly Review Architectural, Mechanical, and Electrical Drawings, and visit the project site as necessary to coordinate construction of all partitions prior to delivery of food service equipment.

3.2 INSTALLATION

A. General: Set each item of non-mobile and non-portable equipment securely in place, level, and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorages where possible. Adjust countertops and other work surfaces to level tolerance of 1/16" maximum offset, and maximum variation from level or indicated slope of 1/16" per foot.

1. Where indicated or required for safety of equipment operator, anchor equipment to floor or wall. Where equipment is indicated to be anchored to floor, provide legs with adjustable flanged foot. Install two anchors on each foot.

B. Field Joints: Complete field-assembly joints in the work (joints that cannot be completed in shop) by welding. Grind welds smooth and restore finish.

C. Enclosed Spaces: Treat spaces that are inaccessible after equipment installation by covering horizontal surfaces with powdered Borax at rate of 4 oz per sq ft.

D. Closure Plates and Strips: Install where required with joints coordinated with units of equipment.

E. Cutouts: Provide finished smooth cutouts in food service equipment where required to run plumbing, electric, gas, or steam lines through equipment items for final connections.

F. Sealants and Gaskets: Install all around each unit to make joints airtight, watertight, vermin-proof, and sanitary for cleaning purposes. In general, make sealed joints not less than 1/8" wide, and stuff backer rod to shape sealant bead properly at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint. At internal-corner joints, apply sealant or gaskets to form a sanitary cove of not less than 3/8" radius. Provide sealant-filled or gasketed joints up to 3/8" joint width; metal closure strips for wider joints, with sealant application each side of strips. Anchor gaskets mechanically or with adhesives to prevent displacement.

3.3 FIELD QUALITY CONTROL

A. Testing: Coordinate start-up of food service equipment when service lines have been tested, balanced, and adjusted for pressure, voltage, and similar considerations. Do not operate steam lines until they have been cleaned and treated for sanitation. Before testing, lubricate each equipment items in accordance with manufacturer's recommendations.

1. Test each item of operational equipment to demonstrate that it is operating properly and that controls and safety devices are functioning. Repair or replace equipment found to be defective in its operation, including units that are below capacity or operating with excessive noise or vibration.

3.4 CLEANING

A. After completion of installation and other major work in food service areas, remove protective coverings, if any, and clean food service equipment, internally and externally. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed-metal surfaces and touch-up painted surfaces. Replace work that cannot be successfully restored.

1. Prior to date of partial occupancy on food service equipment work, buff exposed stainless steel finishes lightly, using power buffer and polishing rouge or grit of No. 400 or finer.

B. Final Cleaning: After testing and start-up, and before time of partial occupancy, clean all food service equipment and leave in condition for Owner's sanitizing procedures prior to use in food service.

3.5 CLOSEOUT PROCEDURES

A. Provide services of Installer's technical representative, and manufacturer's technical representative, to instruct Owner's personnel in operation and maintenance of food service equipment.

1. Schedule training with Owner's representative; provide at least 7-day notice of training date to Owner's representative.

3.6 FOOD SERVICE EQUIPMENT SCHEDULE - ITEM SPECIFICATIONS

Item #1 Washer / Dryer: By Owner

Item #2 Bread Racks: By Vendor

Item #3 Sheet Pan Racks: Four (4) Required

A. Metro model #RD78N
   1. Furnish standard unit with universal slides.

Item #4 Work Table W/ Overshelf: One (1) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top measuring 36" x 30" with integral 4"h backsplash with 1"return to wall on 90° angle, terminate free edges down 1-1/2" and back ½"
   2. Mount top on open st. stl. base with 16 ga. undershelf welded to 1 5/8" O.D. legs at 10" AFF, fit legs with adjustable st. stl. bullet feet two (2) flanged feet.

Item #5 Six-Burner Range: One (1) Required

A. Vulcan model #36C-6B, natural gas range.
   1. Furnish ¾" rear gas and regulator. Cap and cover front manifold.
   2. Furnish #BPD-36 single deck high shelf.
   3. Furnish unit with RR4 caster set, two locking.
   4. Furnish oven with one additional rack.

B. Furnish with a Dormont #1675KITS48 ¾" gas connector kit.

Item #6 Landing Table: Two (2) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top to measure 24" wide x 36" deep having integral 2"x 4" splash at rear, free edges turned down 1 ½" and back ½"
   2. Mount top on open st. stl. base with 16 ga. undershelf welded to 1 5/8" O.D. legs at 10" AFF, fit legs with adjustable st. stl.

Item #7 Steamer: Existing Relocate

A. Cleveland #24CEA10 Steamcraft, Electric 208V, 3 Ph.
B. Cleveland Claris filter system. System mounted as shown on plan.
   1. KEC to relocate to new kitchen.
   2. KEC to furnish #LGDCK Drain Cooling Kit, part #106290. Kit to be installed by an Authorized Service Agent.

C. The School District to furnish new filter cartridges if needed.
D. The utilities to be disconnected by others.

Item #8 40 Gal. Kettle: Existing Relocate

A. Cleveland #KEL40TSH, tilting, Electric 208V,
   1. Provide with T&S Brass #B-0113-B Pre-Rinse unit, #B-0107 spray valve, stainless steel hose.
   2. KEC to relocate to new kitchen.

B. The utilities to be disconnected by others.

Item #9 Exhaust Hoods/Fire System: By HVAC Division

A. Stainless steel wall flashing to be included in hood package by HVAC.
   1. Provide make-up air plenum boxes.

Item #10 SPARE NUMBER

Item #11 SPARE NUMBER

Item #12 SPARE NUMBER

Item #13 Mobile Worktable: Two (2) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top to measure 72"x 36" having all edges turned down 1 ½" and back ½" mounted on locking castors.
   2. Mounted above shall be a 12" shelf centered as indicated, supported via 1 5/8" O.D. tubing through top to shelf anchor below top
   3. Furnish two (2) 15"x 20"x 5" d st. stl. drawers, semi enclosed, mounted on H.D. roller bearing slides as shown.

Item #14 Pot and Pan Shelving: One (1)-Lot Required

A. Metro Max Q shelves to consist of the following:

(16)	MQ2448G	Shelves
(16)	MQ74UPE	Posts
(08)	5MX	Casters
(08)	5MBX	Casters with Brakes
(10)	MTR2448XE	Drying Racks

Item #15 Prep Table W/ Sinks: One (1) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top to measure 30"x 90", side and rear splash 2" x 6" high with interlocking splash detail as described in item 17. ¾" raised marine edge with all edges turned down 2 ¼" and back ½"
   2. Full length overshelf 14" deep mounted above with back turned up 2", supported via 1 5/8" O.D. tubing through top to shelf anchor below top
   3. Furnish integral with top, two (2) 18"x18"x10" d fully coved sinks fitted with 2" lever drains.
      a. Furnish a T&S #B-0201 deck mount faucet.
   4. Furnish one 1 (1) 15"x 20"x 5" d st. stl. drawer, semi enclosed, mounted on H.D. roller bearing slides.
   5. Furnish two 115v/1Ø receptacles below top, one each side of table at center legs. Mount in an inverted pedestal outlet, pre-wire through legs to J-boxes mounted below undershelf.
   6. Mount top on open st. stl. base with 16 ga. undershelf welded to 1 5/8" O.D. legs at 10" AFF Fit legs with adjustable st. stl. flanged feet.
      a. Omit undershelf below sinks.

Item #16 Slicer w/Stand: One (1) Required

A. Furnish Hobart #HS6N-1 slicer, 115v/1Ø with standard features
B. Furnish one Advance Tabco #AG-MT-242 portable slicer stand with optional #TA-255 castors with TA-25B brakes.

Item #17 **Prep Table W/ Sink: One (1) Required**

A. Custom fabricated per general specifications, NSF, full st. stl.

1. 14 ga. st. stl. top to measure 30"x 102", having all edges turned down 1 ½" and back ½" side, rear splash 2" x 6" high furnished with pocket joint on back side of splash to interlock with item 15. Provide 1" x 1" splash cap to cover joint.
2. Full length overshelf 14" deep mounted above with back turned up 2", supported via 1 5/8" O.D. tubing through top to shelf anchor below top.
   a. Mounted to overshelf and wall at right end shall be a Jamestown Metal Products #P203-36 utility cabinet, finished in #577 Pewter. Attach at wall to right for support.
3. Furnish integral with top, one (1) 18"x18"x10" d fully coved sink fitted with a 2" lever drain.
   a. Furnish a T&S #B-0201 deck mount faucet.
4. Furnish one 1 (1) 15"x 20"x 5" d st. stl. drawer, semi enclosed, mounted on H.D. roller bearing slides.
5. Furnish one 115v/1Ø receptacle mounted in back splash for Item 16. pre-wire through back splash to J-box.
6. Mount top on open st. stl. base with 16 ga. undershelf welded to 1 5/8" O.D. legs at 10" AFF Fit legs with adjustable st. stl. flanged feet.
   a. Omit undershelf below sinks.

Item #18 **Walk-In Cooler/Freezer: One (1) Required**

A. Kolpak Industries combination walk-in cooler/freezer 23'x 16'-4" x 8'-6" h (Nominal). Divided as shown on plan

1. Furnish 4" foamed-in-place polyurethane walls, floor, and ceiling. Prefinished white aluminum interior and exposed exterior.
   a. Furnish matching trim to wall openings.
   b. Floor to be recessed and have aluminum tread plate overlay. Furnish with old style #51760-2565 extended st. stl. thresholds.
2. Furnish each 34"x 78" door with view point window, third hinge and half height tread plate protection on interior and exterior.
   a. Furnish door sections with LED light centered over door.
3. Furnish each compartment with two (2) Kason #1810LX LED fixtures with diode strips.
4. Furnish cooler with #PC149MOP, 1.5 HP, 208v/3Ø cooler system for outdoor installation.
5. Furnish freezer with PC299LOP, 3.5 HP, 208v/3Ø freezer system for outdoor installation.
6. K.E.C. to install refrigeration systems, pipe, charge, and fire. Extend condensate drain line to floor drain.

Item #19 **Walk-In Shelving: One (1)-Lot Required**

A. Metro Pro series shelving to consist of the following:

1. Shelving shall be 4 tier throughout.

(48)	PR2454NK3	Shelves
(12)	PR2436NK3	Shelves
(64)	74PK3	Posts

Shelves to be 3-high below evaporator coils

Item #20 **SPARE NUMBER**

Item #21 **SPARE NUMBER**

Item #22 **SPARE NUMBER**

Item #23 **Dunnage Rack: One (1) Lot Required**

A. New Age HD Series.
   1. Dunnage Rack shall be 2 tier.
      (4) 1022
      (2) 1021

Item #24 **Can Rack: Two (2) Required**

A. Metro Pro series shelving to consist of the following:
   1. Shelving shall be 4 tier.
      (08) PR2448NK3 Shelves
      (08) 74PK3 Posts
      (30) CR24E Can dispensers for #10 and #5 cans.

Item #25 **Kitchen Shelving: Two (2) Required**

A. Metro Pro series shelving to consist of the following:
   1. Shelving shall be 5 tier.
      (10) PR2442NK3 Shelves
      (8) 74PK3 Posts

Item #26 **Hand Sinks: By Plumbing Contractor**

Item #27 **Pass-Thru Refrigerator: Two (2) Required**

A. Traulsen two section pass-thru refrigerators, 115v/1Ø,
   hinged as indicated with controls toward kitchen
   1. Furnish one (1) each #G20004P with the following:
      a. G23ACC-TK4LR set of 7 pairs universal tray slides
      b. G23ACC-UEZ set of 3 pairs universal tray slides with pilaster.
      c. G23ACC-SHLF5 set of 3 epoxy coated shelves w/ pins.
   2. Furnish one (1) each #G20004P with the following:
      a. G23ACC-TK4LR set of 7 pairs universal tray slides
      d. G23ACC-UEZ set of 3 pairs universal tray slides with pilaster.
      c. G23ACC-SHLF5 set of 3 epoxy coated shelves w/ pins.
   3. Furnish each with five additional epoxy shelves and clips.
      (each unit to have a total of eight shelves).

Item #28 **Pass-Thru Heated Cabinet: Two (2) Required**

A. Traulsen single section pass-thru holding cabinet, 115v/208/1Ø,
   hinged as indicated with controls toward kitchen
   1. Furnish one #G14303P and one #G14305P
   2. Furnish each unit with #G1ACTK4 universal angle slide accessory kits.
   3. Furnish each with three pair of #GSACC-UVTS sets of additional universal slides

Item #29 **Pass-Thru Heated Cabinet: One (1) Required**

A. Traulsen G24304P double section pass-thru holding cabinet, 115v/208/1Ø,
   hinged as indicated with controls toward kitchen
   1. Furnish each with five additional epoxy shelves and clips.
      (each unit to have a total of eight shelves).

Item #30 **SPARE NUMBER**

Item #31 **SPARE NUMBER**

Item #32 Double Stack Convection Oven: One (1) Existing

A. Vulcan #ET-88-T, natural gas
   1. KEC to relocate to new kitchen.
   3. KEC to furnish, and install a set of 4" factory casters.
   4. KEC to furnish a Dormont #1675KITS48 gas connection kit.

B. The utilities to be disconnected by others.

Item #33 Work Counter: One (1) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top to measure 108" wide x 30" deep having integral 1"x 6" splash at each end, free edges turned down 1 ½" and back ½". Provide two (2) 15" x 20" st. stl. drawer, semi enclosed, mounted on H.D. roller bearings as shown.
   2. Mount top on cabinet style st. stl. base with 16 ga. adjustable intermediate shelf and bottom shelf 6" legs with adjustable st. stl. bullet feet.

Item #34 Double Stack Convection Oven: Two (2) Existing

A. **Vulcan #ET-88-T, Electric Oven**
   1. Provide for factory authorized electrical reconfiguration.
   2. Rewire existing single connection into (2) individual electrical connections.
   3. KEC to relocate to new kitchen.
   4. KEC to furnish, and install a set of 4" factory caster sets.
   5. Utilities to be disconnected by others.

Item #35 Work Counter: One (1) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top to measure 108" wide x 30" deep having integral 1"x 6" splash at each end, free edges turned down 1 ½" and back ½". Provide two (2) 15" x 20" st. stl. drawer, semi enclosed, mounted on H.D. roller bearings as shown.
   2. Mount top on cabinet style st. stl. base with 16 ga. adjustable intermediate shelf and bottom shelf 6" legs with adjustable st. stl. bullet feet.

Item #36 Work Table W/ Overshelf: One (1) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. top to measure 36" wide x 30" deep having integral 2"x 4" splash at rear and right end, free edges turned down 1 ½" and back ½". Provide 15" x 20" st. stl. drawer, semi enclosed, mounted on H.D. roller bearings.
   2. Mount top on open st. stl. base with 16 ga. undershelf welded to 1 5/8" O.D. legs at 10" AFF, fit legs with adjustable st. stl. bullet feet two (2) flanged feet.
   3. Provide splash mounted overshelf 18 ga. st. stl. 12" deep with 2" splash at back, mount at +20" above top.

Item #37 Sink Unit: One (1) Required

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14 ga. st. stl. with integral 8" splash having 2" return to wall on 45° angle. Terminate free edges in a 3"h x 1 ½" rolled rim.
   2. Weld integral with top, one 16"x 20"x 14"d fully coved sink bowl. Fit with a 2" lever drain.
      a. Furnish one (1) T&S Brass model #B-0231 faucet.
   3. Provide splash mounted overshelf 18 ga. st. stl. 12" deep with 2" splash back, mount at +20" above sink.
   4. Mount sink on open st. stl. base with left, right and front crossrails welded to legs at 10" AFF. Fit legs with adjustable st. stl. bullet feet.

Item #38 **Proof/Hot Cabinet: One (1) Existing**

A. Metro model #C599-NDC-U, 115v/1Ø hot/proof cabinet.
   1. KEC to relocate to new kitchen.

Item #39 **Baker's Table: One (1) Required**

A. Custom fabricated per general specifications, NSF full st. stl.
   1. 14 ga. top to measure 32"x 96" having integral 2"x 6" splash at rear. Front edged to be terminated in an inverted 1 ½" rolled rim set ½" below work surface.
   2. Splash mounted above shall be a full length, 12 ½" wide overshelf Support via 1 5/8" O.D. tubing through splash to anchor brackets below top.
      a. Mounted to overshelf and wall at left end shall be a Jamestown Metal Products #P203-36 utility cabinet, finished in #577 Pewter.
   3. Mount top on an open st. stl. base with tier of three 15"x 20"x 5" d st. stl. drawers in an enclosed housing. Mount drawers on heavy duty roller bearing slides. Furnish bottom shelf with 40" opening at right with right and rear crossrails welded to 1 5/8" legs at 10" AFF. Fit legs with adjustable st. stl. bullet feet.

B. Furnish three (3) Cambro IBS-27 ingredient bins.

Item #40 **SPARE NUMBER**

Item #41 **SPARE NUMBER**

Item #42 **SPARE NUMBER**

Item #43 **60 Qt. Mixer: Existing Relocate**

A. Hobart model #HL600-1STD, 208v/3Ø
   1. KEC to relocate to new kitchen.

Item #44 **Dry Storage Shelving: One (1)-Lot Required**

A. Metro Industries Top-Track shelving and accessories to consist of:
   1. Shelving shall be 5 tier.

(02) ea.	TTE24C	Top Track Stationary End Unit Kit
(05) ea.	TTM21C	Top Track Mobile Unit Kit
(10) ea.	PR2460NK3	24"x 60" shelves
(25) ea.	PR2160NK3	24"x 60" shelves
(01) ea.	TTS13NA	Top Track Set

Item #45 **Dry Storage Shelving: One (1)-Lot Required**

A. Metro Pro series shelving to consist of the following:
   1. Shelving shall be 5 tier.

(10)	PR2454NK3	Shelves
(15)	PR2436NK3	Shelves
(20)	86PK3	Posts

Item #46 **SPARE NUMBER**

Item #47 **Ice and Water Dispenser W/ Ice Maker on Stand: Existing Relocate**

A. Hoshizaki Model #DM-200B with KM-451 MAH on SD-200 stand.
   1. KEC to relocate to new kitchen.
   2. The school district to furnish new water filter cartridges if needed.
   3. The utilities to be disconnected by others.

Item #48 **Tray Rack Dispenser Carts: Four (4) Required**

A. Delfield model #TT2-1014 tray carts, verify tray size.

Item #49 **West Serving Line: One (1)-Lot Required**

A. Delfield Mark 7 series counters per Engineering File #1594015_001A.
   Full st. stl. counter approximately 242" with solid 10" tray slide, st. stl. fronts and legs as described from left to right on the operator's side:
   a. 64" section with Item 49A N8759-D Hot Food Unit set in a 1" recess, open bottom shelf base assembly below and 2" x 4" splash at left end.
   b. 54" Hatco heat lamp with LED light in the food shield above.
   c. Food shield with adjustable sneeze guards for self-service and full serv.
   d. 20" open base section with bottom and intermediate shelves.
   e. 36" section with Item 49B N8630 Hot/ Cold Well with louvered access doors.
   f. Food shield with adjustable sneeze guards for self-service and full serv.
   g. 36" section with Item 49C N8630 Hot/ Cold Well with louvered access doors.
   h. Food shield with adjustable sneeze guards for self-service and full serv.
   i. 20" open base section with bottom and intermediate shelves.
   j. 30" section with grommet through top and electrical for Item 50 Heated Sandwich Slide, open base with bottom shelf.
   k. 36" open base section with bottom and intermediate shelves and 2" x 4" splash at right.

Item #50 **Heated Sandwich Slide: One (1) Required**

A. Hatco model # GR2SDH-48D, 115v/208/1Ø,
   1. Black designer inset panel and corner caps.

Item #51 **Salad Bar Counter: Two (2) Required**

A. Delfield Mark 7 series counters per Engineering File #1594015-001A.
   Full st. stl. counters with solid 10" tray slides, st. stl. fronts and st. stl. legs
   1. Furnish 84" unit with hinged louvered doors on both sides.
   2. Furnish with #N8156B cold pan, off set to accommodate dry toppings 115v/1Ø.
   3. Furnish two-tier self-serve, dual sided access food guard.

Item #52 **SPARE NUMBER**

Item #53 **Grab-N-Go Reach-in Refrigerators: Two (2) Required (By Vendor)**

Item #54 **Ice Cream Freezer: One (1) Required (By Vendor)**

Item #55 **East Serving Line: One (1)-Lot Required**

A. Delfield Mark 7 series counters per Engineering File #1594015_001A.
   Full st. stl. counter approximately 303.5" with solid 10" tray slide, st. stl. fronts and legs as described from left to right on the operator's side:
   a. 84" section with Item 55A N8773-D Hot Food Unit set in a 1" recess, open bottom shelf base assembly below.
   b. 66" Hatco heat lamp with LED light in the food shield above.
   c. Food shield with adjustable sneeze guards for self-service and full serv.
   d. 12" x 64.5" transition section with 8" x 8" chamfer.
   e. 36" section with vertical food shield, to be easily removable.
   f. 36" section with Item 55B N8630 Hot/ Cold Well with louvered access doors.
   g. Food shield with adjustable sneeze guards for self-service and full serv.

h. 48" section with Item 55C N8643 Hot/ Cold Well with louvered access doors.
i. Food shield with adjustable sneeze guards for self-service and full serv.
j. 87.5" section with a 25.5" open base with bottom and intermediate shelves, 62" section with Item 55D N8759-D Hot Food Unit set in a 1" recess, 2" x 4" splash at right, open bottom shelf base assembly below.
k. 54" Hatco heat lamp with LED light in the food shield above.
l. Food shield with adjustable sneeze guards for self-service and full serv.

Item #56 Dishtables: One (1)-Set Required

A. Custom fabricated per general specifications, NSF, full st. stl.
1. 14 ga. st. stl. tops per size and shape on floor plan drawing, with 8" integral splash having 2" return to walls on 45° angle. Free edges terminated in a 3"h x 1 ½" rolled rim.
a. Furnish integral drop off sill with ¾" marine "V" edge and turned down 4".
2. Weld integral where shown in soiled table, the top flange for item #59 Scrap Collector.
a. Punch top for pre-rinse faucet furnished with Item #59
3. Mount tops on open st. stl. base with 16 ga. undershelf where possible, welded to 1 5/8" O.D. legs. Fit legs with adjustable st. stl. bullet feet.
a. Furnish booster heater slide brackets below clean top.

Item #57 Booster Heater: One (1) Required

A. Hatco Corp. model #C-27-SSBB, 208v/3Ø booster
1. Furnish with counter mount slides.
2. Furnish st. stl. body and base.
3. Furnish with water hammer arrestor.

Item #58 Dishmachine: One (1) Required

A. Hobart model #CL44e-7, 208v/3Ø
1. Furnish standard unit, right to left operation, higher than standard chamber, 15kw tank heat.
2. Furnish Drain Water Tempering Kit.
3. Furnish (2) sheet pan racks
4. Furnish table limit switch
3. Furnish water hammer arrestor
4. Furnish vent hood for soiled side and extended vent for clean.
5. Furnish stainless steel pant leg, condensate ducts to 4" above Finished ceiling. Furnish with ceiling collar trim

Item #59 Scrap Collector: One (1) Required

A. Salvajor model #S914 Scrap Collector, 115v/1Ø
1. Furnish standard accessories for right to left operations.
2. Furnish with a T&S #B-0113-08C pre-rinse
3. Furnish custom fabricated st. stl. rack slide.
a. Removable ½"x 1 ½"x ½" channel having location tabs welded to top flange of collector. Locate at 15" toward rear of collector's interior edge.

Item #60 SPARE NUMBER

Item #61 SPARE NUMBER

Item #62 **SPARE NUMBER**

Item #63 **Pot & Pan Sink: One (1) Required**

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. 14'-0" x 2'-6" 14 ga. st. stl. with integral 8" splash having 2" return to wall on 45° angle. Terminate free edges in a 3"h x 1 ½" rolled rim.
   2. Weld integral with top, three 24"x 30"x 14" d fully coved sink bowls. Fit each with a 2" lever drain.
      b. Furnish two (2) T&S Brass model #B-0290 Big-Flo faucets centered over sink dividers.
      c. Furnish one (1) T&S model #B-0133-B08C, mount at left end of left drain board.
   3. Furnish integral 24" left drain board with matching splash and rim. Integral 54" right drain board to accommodate weld in top pan for Collector, Salvajor model P914 Collector, 115v/1Ø
      Furnish matching splash and rim.
   4. Splash mounted above, from right, shall be a 114" 4-bar pot drying rack. Mount via 1 5/8" O.D. tubular supports through splash to anchor brackets below top. Mount at 24" above work surface.
      a. Weld between support brackets a 2"x 3/16" utensil bar fitted with a full complement of st. stl. dual pot hooks.
      b. Furnish 6" h, full length wall rub plate and secure at top of drying rack.
   5. Mount sink on open st. stl. base with left, right and front cross rails welded to legs at 10" AFF. Fit legs with adjustable st. stl. bullet feet.

Item #64 **Reach-in Refrigerator: Two (2) Required (By Vendor)**

Item #65 **Nacho Chip Warmer: Two (2) Required**

A. Star model 15NCPW, 115v/208/1Ø,

Item #66 **Nacho Cheese Dispenser: Two (2) Required**

A. Star model 2WLA-P, 115v/208/1Ø,

Item #67 **Hot Dog Grill W/ Bun Warmer: One (1) Required**

A. Star model #45SC with SST-30, 115v/1Ø (ea)

Item #68 **Pop Corn Popper Display: One (1) Required**

A. Star model #G18-Y, 208v/1Ø

Item #69 **Drawer Warmer: Two (2) Required**

A. Hatco model #HDW-1BN, 115v/1Ø

Item #70 **SPARE NUMBER**

Item #71 **SPARE NUMBER**

Item #72 **SPARE NUMBER**

Item #73 **Reach-in Refrigerator: One (1) Required (By Vendor)**

Item #74 **Storage Shelving: One (1)-Lot Required**

A. Metro Pro series shelving to consist of the following:

(5)	PR1860NK3	Shelves
(4)	86PK3	Posts

Item #75 **Utensil Sink W/ Overshelf: One (1) Required**

A. Advance Tabco model #K7-CS-21
   1. Furnish with Sink mounted overshelf #K-480 and Pot Rack #K-499.
   2. Furnish with a T&S #B-0231-CC Faucet.

Item #76 **Milk Coolers: Three (3) Required**

A. True Mfg. models #TMC-49, (2), TMC-58-DS, 115v/1Ø
   1. Furnish standard finished 12 and 16 case milk coolers.

Item #77 **Cashier Stations: Four (4) Required, Three (3) Existing /Modified One (1) New**

A. Custom fabricated per general specifications, NSF, full st. stl.
   1. Three existing units, (1) with dual tray slides (1) with tray slide on left, (1) with tray slide on right. These units are to be modified with new 10" wide Delfield drop down tray slides to match servery and salad counters.
   2. One new station to match existing double sided tray slide unit to receive new Delfield tray slides.

Item #78 **Condiment Counters: Two (2) Required**

A. Delfield Shelleysteel series counters per Engineering File #1594015_001A. Full st. stl. counters with solid 10" tray slides, st. stl. fronts and 5" casters.
   1. Furnish Model #SCSC-74-B, 74" units, modified to have 3-section cold pans, centered, 115v/1Ø.
      a. Furnish access doors where shown to drain valve.
   2. Furnish each with accessory #SG22B, dual sided portion pack shelf.

B. Furnish each with three (3) Vollrath #19190 top adapters.

C. Furnish each with twelve (12) Server Products #PS-10/82020 portion pumps.

D. Furnish each with twelve (12) Ice Cam Packs.

Item #79 **Napkin and Silverware Carts: Two (2) Required**

A. Metro shelving and components, each consisting of the following:

(04)	2142FS	St. stl. Solid Shelves
(02)	1442FS	St. stl. Solid Shelves
(04)	33UPS	33" Posts for Casters
(04)	63UPS	63" Posts for Casters
(08)	5M	5" Casters
(04)	1WS14C	Shelf Supports
(04)	PH24NC	Push Handles

END OF SECTION 114000

SECTION 129300 - SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concrete Bollards.

B. Related Requirements:
   1. Section 033000 "Cast-in-Place Concrete" for installing concrete footings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type of exposed finish, not less than 6 inch long linear components and 4 inch square sheet components.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For site furnishings.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For site furnishings to include in maintenance manuals.

PART 2 - PRODUCTS

2.1 CONCRETE BOLLARDS

A. Basis of Design Product: Subject to compliance with requirements, provide “Precast Concrete Bollard - Model QR-41B” by Quickcrete Products Corp. or comparable products submitted to and accepted by Architect prior to bidding with the following product characteristics:
   1. Material: Precast steel reinforced concrete fabricated from type III Portland cement per ASTM C150 with a compressive strength of 5000 psi. Steel reinforcement shall contain No 2 and No 3 rebar with wire welded mesh in each product.
   2. Finish: Clear Matt Finish Sealer.
   3. Installation Method: Set in non-shrink grout pockets within site cast concrete footing.

2.2 MATERIALS

A. Steel and Iron: Free of surface blemishes and complying with the following:

B. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials; commercial quality, concealed, recessed, and capped or plugged.

C. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M; 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. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

2.3 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. 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.

D. Factory Assembly: Assemble components in the factory to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.

2.4 GENERAL FINISH REQUIREMENTS

A. 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 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 of the Work.

B. 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 at locations indicated on Drawings.

D. Anchor Bolt Installation: Install concrete footing per manufacturer’s written recommendations with pockets sized for anchor bolts sized for concrete bollard installation. Install concrete bollard containing precast anchor bolts using non-shrink grout as recommended by manufacturer.

END OF SECTION 129300

SECTION 144200 - WHEELCHAIR LIFTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Vertical platform lifts.

B. Related Requirements:
1. Section 033000 "Cast-in-Place Concrete" for coordinating pit size and depth, setting sleeves, inserts, and anchoring devices in concrete.
2. Section 042000 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry.

1.2 DEFINITIONS

A. Definitions in ASME A18.1 apply to Work of this Section.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components, and finishes for lifts.
2. Include rated capacities, operating characteristics, electrical characteristics, safety features, controls, finishes, and accessories.

B. Shop Drawings: For each lift.
1. Include plans, elevations, sections, details, attachments to other work, and required clearances.
2. Indicate dimensions, weights, loads, and points of load to building structure.
3. Include details of equipment assemblies, method of field assembly, components, and location and size of each field connection.
4. Include diagrams for power, signal, and control wiring.

C. Samples for Initial Selection: For surfaces and components with factory-applied color finishes.
1. Include Samples of integrally colored materials and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:
1. Metal Finish: Manufacturer's standard-size unit, not less than 3 inches square.
2. Tubular Products and Running Trim: Manufacturer's standard-size unit, 6 inches long.
3. Hardware: Manufacturer's standard, exposed, door-operating device.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

B. Product Certificates: For each type of lift.
1. Include statement that runway, ramp or pit, dimensions as shown on Drawings, and electrical service as shown and specified are adequate for lift being provided.

C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lift to include in operation and maintenance manuals.
1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
a. Parts list with sources indicated.
b. Recommended parts inventory list.

B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted use of lifts.

C. Continuing Maintenance Proposal: Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard two-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.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
1. Maintenance Proximity: Not more than four hours' normal travel time from Installer's place of business to Project site.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of lifts that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

B. Regulatory Requirements: Comply with ASME A18.1, "Safety Standard for Platform Lifts and Stairway Chairlifts."
1. All designs, clearances, construction workmanship and installation shall be in accordance with requirements specified and code adopted by the authority having jurisdiction. Wheelchair lift shall be subject to local, city and state approval prior to and following installation.

2.2 VERTICAL PLATFORM LIFT (144200.A01)

A. Vertical Platform Lift, General: Pre-engineered lift system.
1. Basis-of-Design Product: Subject to compliance with requirements, provide “Vertical Platform Lift, Model VPC-UL”, as manufactured by Bella Elevator, as distributed by Symmetry Elevating Solutions.
a. Comparable products from other manufacturers, meeting specified requirements, will be considered when submitted to and accepted by Architect prior to bidding.

B. Number of Stops: As indicated in Drawings.

C. Platform Size: 42 by 60 inches.
1. Platform surface shall be “non-skid” design.

D. Door Operation and Clear Opening Width: Low-energy, power-operated doors that remain open for 20 seconds minimum; end door with minimum 32-inch clear opening width.

E. Rated Speed: 10 fpm.

F. Rated Capacity: Not less than 750 pounds.

G. Power Supply: 120 V, 60 Hz, one phase.

H. Motor: Not less than 1HP, 115V, one phase.

I. On-Board Main Controller: Provide manufacturer’s standard stainless steel control station; consisting of and up/down directional control and an illuminated emergency stop switch equipped with an audible alarm.

J. Landing Controllers: Provide manufacturer’s standard stainless steel control stations equipped with constant-pressure, call only device at each landing.

K. Emergency Operation: Provide manual operation to raise or lower unit in case of malfunction or power loss.

L. Self-Supporting Unit: Support vertical loads of unit only at base, with lateral support only at landing levels.

M. Platform: Manufacturer's standard, steel floor plate with checkered texture.

N. Platform Enclosure and Door: Rectangular steel-tube frame with flush steel-sheet panels.

O. Accessories: Provide units with the following accessories:
   1. Provide manufacturer's standard grab rail for platform.

2.3 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: ASTM A 500/A 500M.

C. Steel Pipe: ASTM A 53/A 53M; standard weight (Schedule 40) unless otherwise indicated or required by loads.

D. Steel Sheet: ASTM A 1008/A 1008M, cold-rolled commercial steel (CS) or ASTM A 1011/A 1011M hot-rolled, commercial steel (CS); as required for each use.

E. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 zinc coating,

F. Galvanizing: Hot-dip galvanize items complying with the following:
   1. ASTM A 123/A 123M, for galvanizing steel and iron products.
   2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

G. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; manufacturer's standard strengths and thicknesses for type of use.
   1. Extruded Aluminum: ASTM B 221.
   2. Aluminum Sheet and Plate: ASTM B 209.

H. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.

I. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing structural members, guide rails, machines, and other lift components where installation of devices is specified in another Section.

J. Expansion Anchors: Anchor-bolt-and-sleeve assembly of material indicated below with capability to sustain a load equal to 10 times the load imposed as determined by testing according to ASTM E 488 conducted by a qualified independent testing agency.
   1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

K. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

2.4 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.

2.5 FINISHES

A. Steel Factory Finish:
   1. Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
   2. Color and Gloss: As selected by Architect from manufacturer's full range.

B. Stainless-Steel Finishes: 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 installation tolerances, critical dimensions, and other conditions affecting performance of the Work.

B. Minimum Headroom Clearance: Verify that installed lift will have a minimum headroom of 79 inches at any point during travel.

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

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with ASME A18.1 and manufacturer's written instructions for installation of lifts unless otherwise indicated.

B. Wiring Method: Conceal conductors and cables within housings of units or building construction. Do not install conduit exposed to view in finished spaces. Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

C. Coordinate runway doors with platform travel and positioning, for accurate alignment and minimum clearance between platforms, runway doors, sills, and door frames.

D. Position sills accurately and fill space under sills solidly with nonshrink, nonmetallic grout.
1. Leveling Tolerance: 1/4 inch up or down, regardless of load and direction of travel.

E. Lubricate operating parts of lift, including drive mechanism, guide rails, hinges, safety devices, and hardware.

F. Test safety devices and verify smoothness of required protective enclosures and other surfaces.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of lift installation and before permitting use of lifts, perform acceptance tests as required and recommended by ASME A18.1 and authorities having jurisdiction.

B. Operating Test: In addition to acceptance testing, load lifts to rated capacity and operate continuously for 30 minutes between lowest and highest landings served. Readjust stops, signal equipment, and other devices for accurate stopping and operation of system.

C. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on lifts.

3.4 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of lift Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper lift 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 lifts. Include a review of emergency systems and emergency procedures to be followed at time of operational failure and other building emergencies.

B. Check operation of lifts with Owner's personnel present and before date of Substantial Completion. Determine that operating systems and devices are functioning properly.

C. Check operation of lifts with Owner's personnel present not more than one month before end of warranty period. Determine that operating systems and devices are functioning properly.

END OF SECTION 144200