

OUTLINE SPECIFICATIONS - VOLUME 2

STA OFFICE BUILDING

APRIL 12, 2019



SOLANO TRANSPORTATION AUTHORITY

LIONAKIS

VOLUME 2
OUTLINE SPECIFICATIONS
FOR
STA OFFICE BUILDING
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SECTION 02 30 00
SUBSURFACE INVESTIGATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Geotechnical Investigation Report:

1. A Geotechnical Investigation Report has been prepared for a site across the street from this Project by KC Engineering Company, 865 Cotting Lane, Suite A, Vacaville, California, 95688, phone: 707-447-4025.
2. The report is titled as: Geotechnical Investigation on Proposed Suisun Veterans Hall addition, 427 Main Street, Suisun City, California.
3. The report number is: VV3249, dated August 4, 2011.

B. Use of Data:

1. This report was obtained for use in Project design for a site in close proximity to this project's site, and is referenced for Contractor's information only for an approximate evaluation of possible soil conditions encountered at this project's site.
 - a. The DBE will be responsible for obtaining a site specific Geotechnical Investigation Report to address site specific soil conditions and seismic hazards.
2. Contents of the report referenced in this Section do not constitute a warranty of subsurface conditions.
3. Copies of this report are provided as informational information as part of the RFP documents.
4. Contractor shall visit the site to verify existing conditions.

1.2 QUALITY ASSURANCE

A. A Geotechnical Engineer/Testing Laboratory will be retained and paid by Owner to observe performance of work in connection with the proposed foundation system including piles and piers, excavating, trenching, placing of compacted fill and backfilling operations and at the conclusion of the excavations to provide the following services:

1. Monitor the installation and testing of deep foundations and/or soil improvement proposed and installed by the DBE to determine if the system meets the requirements of the specification.
2. Determine if the soil at the bottom of the excavations is suitable as a base for the structure.
3. Determine if compacted fill, backfill or any other required fill meets the requirements of the Specifications.
4. Determine if imported fill materials comply with the specified requirements.
5. Determine necessary adjustments in moisture content of soil, size of equipment, thickness of layers, and any tests as may be required to ensure a properly placed fill conforming to applicable requirements of Specifications.

6. Observation and testing by Geotechnical Engineer/Testing Laboratory shall be provided during filling and compacting operations. Contractor shall give at least two working days' notice prior to beginning such operations, to allow proper scheduling of observation and testing work.
 7. Field density tests shall be performed by Geotechnical Engineer/Testing Laboratory after compaction of each layer of fill. Where compaction equipment has disturbed the surface to a depth of several inches, density tests shall be taken in the compacted material below the disturbed surface. Additional layers of fill shall not be placed until the field density tests indicate that the specified density has been obtained.
- B. If Contractor fails to meet technical or design requirements of the Contract Drawings and requirements/recommendations of Geotechnical Investigation Report, necessary readjustments shall be made until all work is deemed satisfactory by Geotechnical Engineer/Testing Laboratory, and Architect.
1. No deviation from Specifications shall be permitted without written acceptance from Architect.
- C. Differing Site Conditions: Report differences observed between actual conditions at the site and the conditions indicated in Geotechnical Investigation Report immediately upon discovery. Report the nature and extent of differences to Owner and Architect orally to permit early verification of the conditions, and concurrently submit it in writing.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of designated construction.
- B. Identification of utilities.
- C. Demolition requirements.

1.2 RELATED SECTIONS

- A. Division 01 Sections, as applicable.

1.3 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division 01.
- B. Accurately record actual locations of capped utilities and subsurface obstructions.

1.4 REGULATORY REQUIREMENTS

- A. Perform work of this Section under provisions of CBC Chapter 33, CFC Chapter 33, and NFPA 241 for demolition work, safety of structure, dust control and safety of occupants.
- B. Obtain required permits from authorities.
- C. Do not close or obstruct egress width to exits.
- D. Do not disable or disrupt building fire or life safety systems without three-day prior written notice to Owner.
- E. Conform to procedures applicable when discovering hazardous or contaminated materials.

1.5 SCHEDULING

- A. Schedule work under the provisions of Division 01.
- B. Describe demolition removal procedures and schedule.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PREPARATION

- A. Provide, erect and maintain temporary barriers as required.

- B. Erect and maintain temporary partitions to prevent spread of dust, odors and noise to adjoining facilities.
- C. Protect existing materials and finishes that are not scheduled or otherwise required to be demolished.
- D. Mark location of utilities.

3.2 DEMOLITION REQUIREMENTS

- A. Conduct demolition to minimize interference with adjacent and occupied buildings.
- B. Maintain protected egress and access to the Work.

3.3 DEMOLITION

- A. Disconnect, remove, cap and identify designated utilities within demolition areas.
- B. Demolish in an orderly and careful manner. Protect existing supporting structural members and materials.
- C. Except where noted otherwise, remove demolished materials from site. Do not bury or burn materials on site.
- D. Remove demolished materials from site as Work progresses. Upon completion of Work, leave areas in clean condition.
- E. Remove temporary Work.

END OF SECTION

SECTION 03 11 00
CONCRETE FORMING

PART 1 PRODUCTS

1.1 FORM MATERIALS

A. Architectural Cast Concrete Finish:

1. Phenolic-faced plywood (minimum 167 g/m² on both faces); minimum 5/8 inch thickness; conforming to PS 1 APA HDO Plyform Class II or better; sound, undamaged sheets with clean, true edges, joints taped.
2. Cylindrical Forms: Multi-layered fiber forms with coated lining for smooth, glass-like, no-spiral finish.
 - a. Basis-of-Design Product: Sonotube Finish Free Fiber Form by Sonoco Products Co., Hartsville, SC; 843-383-7000; www.sonoco.com. Provide the named product or accepted equal.

B. Smooth Concrete Concealed from View: Plywood; 5/8 inch minimum thickness; conforming to PS 1 APA B-B Plyform Class II or better.

C. Concrete Concealed from View:

1. 2x lumber, plywood conforming to PS 1 APA Plyform Class II or better, tempered concrete form hardboard conforming to AHA A135.4, or other acceptable material.
2. Cylindrical Forms: Multi-layered fiber forms made from high-quality fiber, spirally wound and laminated with waterproof adhesives.
 - a. Basis-of-Design Product: Sonotube Fiber Form – A Coated by Sonoco Products Co., Hartsville, SC; 843-383-7000; www.sonoco.com. Provide the named product or accepted equal.

D. Foam Infill at Elevated Concrete: Type VII extruded polystyrene rigid foam insulation. Product: Dow Building Solutions Styrofoam Highload 60 or accepted equal with the following characteristics:

1. Thermal Resistance, per inch, at 75 degrees F mean temp., ft²•h• degrees F/Btu, R-value, minimum: 5.0 per ASTM C177 and ASTM C518.
2. Compressive Strength: 60 psi, minimum per ASTM D1621.
3. Water Absorption, percent by volume, maximum (24 hour water immersion): 0.3 per ASTM C272.
4. Water Vapor Permeance: 0.8 perms per ASTM E96.
5. Maximum Use Temperature: 165 degrees F.
6. Coefficient of Linear Thermal Expansion, in/in• degrees F: 3.5 x 10⁻⁵, per ASTM D696.
7. Flexural Strength: 75 psi minimum per ASTM C203.
8. Complies with ASTM C578, Type VII.
9. Edges: Square.
10. Thickness: As indicated on Drawings. Taper insulation where shown on Drawings.

1.2 ACCESSORIES

- A. Chamfer Strips: Wood, metal, or rubber strips; size as shown on Drawings, minimum 3/4 inch by 3/4 inch.
- B. Expansion Joint Filler: Refer to Section 03 30 00.
- C. Foam Board Separation: Expanded polystyrene in size and thickness to suit application.
- D. Keyed Construction Joint: Minimum 24 gauge galvanized steel; shaped with formed key (minimum 1-1/2 inch) for load transfer; and with knockouts for dowel placement.
 - 1. Basis-of-Design Product: G-33 Screed Key Joint by Dayton/Richmond Concrete Accessories, Miamisburg, OH; 800-745-3700; www.daytonrichmond.com. Provide the named product or accepted equal.
- E. Form Ties: Provide as indicated and as required.
 - 1. Galvanized steel; adjustable length; cone type; snap-off type with 1 inch back break dimension; free of defects that could leave holes larger than 1 inch in concrete surface.
 - 2. Substitution: In lieu of galvanized steel ties, Contractor may use stainless steel form ties of equal or higher strength.
 - a. Stainless Steel Form Tie System:
 - 1) Stainless Steel Snap Tie, Product No. A-44 by Dayton Superior, Miamisburg, OH; 800-745-37000; www.daytonsuperior.com.
 - 2) Stainless Steel Snap Ties by Meadow Burke, Tampa, FL; 877-518-7665, www.meadowburke.com.
 - 3) Or accepted equal.
- F. Plastic Stakes: At Contractor's option, solid plastic stakes may be used in lieu of wood and steel stakes. Provide solid plastic stakes for use in areas with continuous vapor retarder.
 - 1. Basis-of-Design Product: VaporStake™ by VaporStake LLC, Chino Hills, CA; 714-519-4211, www.vaporstake.com.
 - 2. Material: Non-corrosive, leak-resistant, solid PVC, with one pointed end and multiple pre-drilled holes for nailing; diameter and length as recommended by stake manufacturer, and as required by field conditions.
- G. Nails, Spikes, Lag Bolts, Through-Bolts, Anchors: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- H. Spreaders: Metal; use of wood spreaders will not be permitted.
- I. Form Release Agent: Commercially formulated form release agents that will not bond with, stain or adversely affect concrete surface, and will not impair subsequent treatment of concrete surfaces, nor impede the wetting of surfaces to be cured with water or curing compounds. Product shall meet the VOC requirements at the location of use.
 - 1. Product: Duogard as manufactured by W.R. Meadows or accepted equal.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 PRODUCTS

1.1 STEEL REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60, low-alloy deformed steel bars.
- B. Reinforcing Steel Indicated to be Welded: ASTM A706/A706M, Grade 60, low-alloy deformed steel bars.
- C. Reinforcing Steel Used in Special Reinforced Concrete Moment Frames and Special Reinforced Concrete Shear Walls: ASTM A706/A706M, Grade 60, low-alloy deformed steel bars. ASTM A615/A615M, Grade 60, deformed steel bars may be used if the actual yield strength based on mill tests does not exceed the specified yield strength by more than 18,000 psi and the ratio of the actual tensile stress to the actual yield strength is not less than 1.25.
- D. Plain Steel Wire (for Spiral Reinforcement): ASTM A1064/1064M.
- E. Deformed Steel Wire: ASTM A1064/A1064M.
- F. Welded Wire Fabric: ASTM A1064/1064M; 65 ksi minimum yield strength; fabricated from as-drawn steel wire into flat sheets (rolled fabric not permitted).
 - 1. Size: As indicated on Drawings.
- G. Tie Wire: Black annealed steel wire; No. 16 gauge.

1.2 ACCESSORIES

- A. Bar Supports (Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place): Provide in accordance with CRSI Manual of Standard Practice from steel wire, plastic, or precast concrete or fiber-reinforced concrete of equal to or greater compressive strength than surrounding concrete. Provide as follows:
 - 1. Footings: Precast concrete blocks with tie wires.
 - 2. Slab on ground: Precast concrete blocks, plastic coated steel fabricated with bearing plates, or specifically designed wire-fabric supports fabricated of plastic.
 - 3. Where legs of wire bar supports contact forms: CRSI Class 1 plastic-protected or CRSI Class 2 stainless steel bar supports.
 - 4. Where support is no closer to concrete surface than 1/2 inch: CRSI Class 3 wire supports.
 - 5. Supports placed against ground: Precast concrete blocks not less than 4 inch square with embedded wire.
- B. Welding Materials For Reinforcing Steel:
 - 1. Weld Filler Material: AWS D1.4; low hydrogen, 80 ksi tensile strength.

- C. Mechanical Splices: Splicing devices capable of developing 125 percent of the specified yield strength of the bar in compression and tension.
1. Metal Sleeve with Cast Filler Metal:
 - a. Acceptable Product: Cadweld Rebar by Erico International Corporation, Solon, OH; 800-248-2677; www.erico.com, or accepted equal.
 2. Mechanical Threaded Connections: Provide threaded mechanical connections using a metal coupling sleeve with internal threads.
 - a. Acceptable Product: Lenton Couplers by Erico International Corporation DB-SAE Dowel Bar Splicers by Dayton Concrete Accessories, Miamisburg, OH; 800-745-3700, www.daytonconcreteacc.com, or accepted equal.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. BASF Corporation – Admixture Systems, Cleveland, OH; 800-228-3318, www.basf-admixtures.com.
2. BASF Corporation – Building Systems, Shakopee, MN; 800-433-9517, www.buildingsystems.basf.com.
3. Curecrete Distribution Inc., Springville, UT; 800-998-5664, www.ashfordformula.com.
4. Grace Construction Products – W. R. Grace & Co., Cambridge, MA; 877-423-6491, www.na.graceconstruction.com.
5. Greenstreak, Inc., St. Louis, MO; 800-325-9504, www.greenstreak.com.
6. Pecora Corp., Harleysville, PA; 800-523-6688, www.pecora.com.
7. Raven Industries Inc, Sioux Falls, SD; 800-635-3456, www.ravenind.com.
8. Reef Industries, Inc., Houston, TX; 800-231-6074, www.reefindustries.com.
9. Sika Corp., Lyndhurst, NJ; 800-933-7452, www.sikaconstruction.com.
10. Sika Scofield, Los Angeles, CA; 800-800-9900, www.scofield.com.
11. Stego Industries, LLC, San Clemente, CA; 877-464-7834, www.stegoindustries.com.
12. The Euclid Chemical Co., Cleveland, OH; 800-321-7628, www.euclidchemical.com.
13. Tremco, Beachwood, OH; 800-852-9068, www.tremcosealants.com.
14. TXI – Pacific Custom Material, Inc., Port Costa, CA; 510-787-0150.
15. US Mix Products Co., Denver, CO; 800-397-9903, www.usspec.com.
16. Vinylex Corp., Knoxville, TN; 800-624-4435, www.vinylex.com.
17. W. R. Meadows, Inc., Hampshire, IL; 800-342-5976, www.wrmeadows.com.

B. Substitutions: Manufacturers and products are listed in this Section to establish minimum requirements as to quality and performance.

1.2 CONCRETE MATERIALS

A. Cementitious Materials:

1. Cement: ASTM C150, Type II, low alkali (equivalent alkalis ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) no more than 0.6 percent per ASTM C114), gray.
2. Cement: ASTM C150, Type V, low alkali (equivalent alkalis ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) no more than 0.6 percent per ASTM C114). Use this Type of cement when soils report requires high sulfate resistance.
3. Supplementary Cementitious Materials (SCM):
 - a. Fly Ash: ASTM C618, Class F or Class N. Class C is not permitted.
 - b. Slag Cement: ASTM C989, Grade 100 or Grade 120.

- B. Aggregates: Aggregates used in concrete shall have a combined aggregate distribution similar to the aggregates used in the concrete represented by field test data or used in trial mixtures. Fine and coarse aggregates: ASTM C33. Low-shrinkage producing coarse aggregates per ACI 221R; and uniformly graded as follows:

Sieve Number or Size in Inches	Percent Retained by Weight		
	1-1/2 inch Max.	1 inch Max.	3/4 inch Max.
2 inch	0-5	—	—
1-1/2 inch	0-8	0-5	—
1 inch	8-18	0-8	0-5
3/4 inch	8-18	8-18	0-8
1/2 inch	8-18	8-18	8-18
3/8 inch	8-18	8-18	8-18
No. 4	8-18	8-18	8-18
No. 8	8-18	8-18	8-18
No. 16	8-18	8-18	8-18
No. 30	8-18	8-18	8-18
No. 50	0-18	0-18	0-18
No. 100	0-8	0-8	0-8
No. 200	0-8	0-8	0-8

1. Maximum Nominal Size of Coarse Aggregate: CBC Section 1903 “Specifications for Tests and Materials”, and as follows:
 - a. 1/5 the narrowest dimension between sides of forms,
 - b. 1/3 depth of slab, or
 - c. 3/4 the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or prestressing tendons or ducts.
2. Lightweight: ASTM C330.
 - a. Acceptable products:
 - 1) Expanded shale as manufactured by TXI – Pacific Custom Material, Inc.
 - 2) Or accepted equal.
3. Aggregate sources shall not contain any alkali-silica reactive material in accordance with ASTM C33, Appendix XI.

C. Water: Potable and complying with ASTM C1602/C1602M.

1.3 ADMIXTURES

A. General:

1. Manufacturer certified to contain no more than 0.05 percent water-soluble chloride ions by mass of cementitious material. Admixtures containing calcium chloride or thiocyanates not allowed.

2. Compatible with other admixtures and cementitious materials in the concrete mix.
 3. Obtain Architect's written acceptance prior to use of admixtures. Use admixtures according to manufacturer's written instructions.
- B. Air Entraining Agents: ASTM C260.
1. Acceptable Products:
 - a. MasterAir-AE90, MasterAir AE 200, or MasterAir VR 20 by BASF Corporation – Admixture Systems.
 - b. Darex AEA by Grace Construction Products.
 - c. Eucon Air Mix or Eucon AEA Series by The Euclid Chemical Co.
 - d. Or accepted equal.
- C. Water Reducing:
1. Normal Range: ASTM C494/C494M, Type A.
 - a. Acceptable Products:
 - 1) MasterPozzolith Series by BASF Corporation – Admixture Systems.
 - 2) Eucon Series by The Euclid Chemical Co.
 - 3) WRDA 64 by Grace Construction Products.
 - 4) Plastocrete 161 by Sika Corp.
 - 5) Or accepted equal.
 2. Mid Range Water-Reducing: ASTM C494/C494M, Type A or Type F.
 - a. Acceptable Products:
 - 1) MasterPolyheed Series BASF Corporation – Admixture Systems.
 - 2) Eucon Series by The Euclid Chemical Co.
 - 3) Duracem 55 by Grace Construction Products.
 - 4) Or accepted equal.
 3. High Range Water-Reducing: ASTM C494/C494M, Type F or G.
 - a. Acceptable Products:
 - 1) MasterRheobuild 1000 or MasterGlenium Series by BASF Corporation – Admixture Systems.
 - 2) Eucon Series or Plastol Series by The Euclid Chemical Co.
 - 3) Duracem 100 by Grace Construction Products.
 - 4) Sikament 10 ESL by Sika Corp.
 - 5) Or accepted equal.
- D. Shrinkage Reducing: Reduces dry shrinkage up to 80 percent at 28 days, and up to 50 percent at one year and beyond as tested per ASTM C157/C157M.
1. Acceptable Products:
 - a. MasterLife SRA 20 by BASF Corporation – Admixture Systems.
 - b. Eclipse Floor and Eclipse Plus by Grace Construction Products.
 - c. Eucon SRA Series or Conex by The Euclid Chemical Co.

- d. Or accepted equal.
- E. Set Retarding: ASTM C494/C494M, Type B or Type D.
 - 1. Acceptable Products:
 - a. Pozzolith Series or MasterSet DELVO Series by BASF Corporation – Admixture Systems.
 - b. Eucon Retarder Series, Eucon DS, or Eucon Stasis by The Euclid Chemical Co.
 - c. Or accepted equal.
- F. Set Accelerating: ASTM C494/C494M, Type C or Type E.
 - 1. Acceptable Products:
 - a. MasterSet AC 534 or MasterSet FP 20 by BASF Corporation – Admixture Systems.
 - b. Accelguard Series by The Euclid Chemical Co.
 - c. Or accepted equal.
- G. Workability-Retaining: Shall retain concrete workability without affecting time of setting or early-age strength development. ASTM C494/C494M, Type S.
 - 1. Acceptable Products:
 - a. MasterSure Z 60 by BASF Corporation – Admixture Systems.
 - b. Plastol AMP Series by The Euclid Chemical Co.
 - c. Or accepted equal.
- H. Integral Color: Furnish color manufacturer with mix design to verify compatibility. Obtain written acceptance of mix design and certification of compatibility. Color admixture and curing compound shall be provided by one manufacturer.
 - 1. Color Pigment Materials: ASTM C979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, non-fading, and resistant to lime and other alkalis.
 - 2. Acceptable Manufacturers:
 - a. Sika Scofield. Products:
 - 1) Color Admixture: Chromix P or Chromix ML.
 - 2) Curing Compound: Lithochrome Colorwax.
 - b. BASF Corporation – Admixture Systems. Products:
 - 1) Color Admixture: MasterColor L Series.
 - 2) Curing Compound: MasterKure CC 1315 by BASF Corporation – Building Systems.
 - c. The Euclid Chemical Co. Products:
 - 1) Color Admixture: Colorcrete.
 - 2) Curing Compound: Diamond Clear VOX.
 - d. Davis Colors. Products:
 - 1) Color Admixture: Mix-Ready powdered color additive.
 - 2) Curing Compound: Color Seal II, tinted to match admixture color.

- e. Conspec Marketing & Manufacturing Co., Inc.; a Dayton Superior Company.
- 3. Colors: As selected by Architect from manufacturer's full range of colors.

1.4 CURING MATERIALS AND SLAB TREATMENT

A. General:

- 1. Comply with regulations of the California Air Resources Board and the local Air Pollution Control/Air Quality Management District.
 - a. VOC Limit: 350 g/L.
- 2. Verify compatibility with subsequent adhesives and coatings before application; furnish Manufacturer's certificate of compatibility. Coordinate with related Sections.

B. Curing Compound: Select as appropriate for compatibility of subsequent adhesives and coatings.

- 1. Water-emulsion, dissipating resin based; meets or exceed ASTM C309, Type 1, Class B.
 - a. Acceptable Products:
 - 1) Kurez DR VOX by The Euclid Chemical Co.
 - 2) 1100 by W. R. Meadows, Inc.
 - 3) US SPEC Maxcure Resin Clear by US Mix Products Co.
 - 4) Or accepted equal.

C. Curing and Sealing Compound for Colored Concrete: Refer to Section 03 35 19.

D. Waterproof Sheet Materials for Curing: ASTM C171 and as follows:

- 1. Curing paper consisting of two sheets of kraft paper adhered together with a bituminous material with embedded cords or strands of fiber running in both directions not more than 1-1/4 inches apart.
 - a. Tensile strength in machine direction: Thirty foot-pounds per inch of width minimum.
 - b. Tensile strength in cross direction: Fifteen foot-pounds per inch of width minimum.
- 2. Polyethylene Film: ASTM D4397; minimum six mil thickness.
- 3. White burlap-polyethylene sheeting: Consisting of burlap weighing not less than nine ounces per square yard extrusion coated on one side with at least four mil white opaque polyethylene sheet.

E. Evaporation Retarder: Water-based polymer concentrate, readily dilutable in water.

- 1. Acceptable Products:
 - a. MasterKure ER50 by BASF Corporation – Admixture Systems.
 - b. Eucobar by The Euclid Chemical Co.
 - c. US SPEC Monofilm ER by US Mix Products Co.
 - d. Or accepted equal.

F. Surface Retarder: Water soluble liquid, formulated to retard wet surface of mortar in concrete.

1. Acceptable Products:

- a. MBT EAC-S Regular or Deep by BASF Corporation – Admixture Systems.
- b. Sure Etch Series by The Euclid Chemical Co.
- c. Rugasol-S by Sika Corp.
- d. Or accepted equal.

G. Concrete Sealer (General Use): Chemically reactive, waterborne solution of inorganic silicate or silicate materials; odorless, colorless.

1. Acceptable Products:

- a. Cureseal-W Concrete Sealer by Sika Scofield.
- b. MasterKure HD 200 WB by BASF Corporation – Building Systems.
- c. Eucosil by The Euclid Chemical Co.
- d. Aqua-Trete SG by Evonik.
- e. US SPEC Industraseal by US Mix Products Co.
- f. Or accepted equal.

H. Color Staining and Stamping: Refer to Section 03 35 19.

I. Color Hardener: Refer to Section 03 35 19.

J. Vapor Emission Control System: Refer to Section 07 26 50.

K. Water Repellent: Refer to Section 07 19 00.

1.5 GROUTING, BONDING, AND PATCHING MATERIALS

A. Grout:

1. Non-shrink Grout: ASTM C1107, non-metallic aggregate grout; 7000 psi minimum 28-day compressive strength at fluid water ratio per ASTM C939.

a. Acceptable Products:

- 1) MasterFlow 928 by BASF Corporation – Building Systems.
- 2) NS Grout, Hi-Flow Grout, or Euco Pre-Cast Grout by The Euclid Chemical Co.
- 3) US SPEC MP Grout by US Mix Products Co.
- 4) Or accepted equal.

2. Non-shrink Drypack Grout: Non-shrink, natural aggregates, 7000 psi minimum 28-day compressive strength.

a. Acceptable Products:

- 1) MasterFlow 100 by BASF Corporation – Building Systems.
- 2) Dry Pack Grout by The Euclid Chemical Co.
- 3) Sealtight Pac-it by W.R. Meadows, Inc.
- 4) US SPEC GP Grout by US Mix Products Co.
- 5) Or accepted equal.

B. Bonding Materials:

1. Bonding Agent/Admixture:

a. Interior or exterior applications: Acrylic or SBR, latex cement bonding agent/admixture; non-re-emulsifiable; meets or exceeds ASTM C1059, Type II.

1) Acceptable Products:

- a) Akkro-7T, Flex-Con, or SBR Latex by The Euclid Chemical Co.
- b) US SPEC Acrylcoat by US Mix Products Co.
- c) Sealtight Acry-Lok by W. R. Meadows, Inc.
- d) Or accepted equal.

b. Interior applications or exterior applications not subject to constant water immersions: Ethyl-vinyl acetate (EVA) copolymer liquid bonding agent and admixture; re-emulsifies once and will not re-wet; meets or exceeds ASTM C1059.

1) Acceptable Products:

- a) Tammsweld by The Euclid Chemical Co.
- b) US SPEC Multicoat by US Mix Products Co.
- c) Or accepted equal.

2. Structural Bonding Epoxy Adhesive: Two component, 100 percent solids, 100 percent reactive; meets or exceeds ASTM C881/C881M, Type II, Grade 2, Class B or C as appropriate.

a. Acceptable Products:

- 1) MasterEmaco ADH 1090RS, MasterEmaco ADH 1420, or MasterEmaco ADH 327RS by BASF Corporation – Building Systems.
- 2) Dural 452 MV by The Euclid Chemical Co.
- 3) Sealtight Rezi-Weld 1000 by W. R. Meadows, Inc.
- 4) Or accepted equal.

C. Self-Leveling Underlayment: Portland cement based, self-leveling 1 inch thick to featheredge. Fast setting – minimum compressive strength 2200 psi after one day; minimum 4000 psi compressive strength at 28 days per ASTM C109.

1. Acceptable Products:

- a. K-15 Self-Leveling Underlayment Concrete by ARDEX Engineered Cements.
- b. MasterTop 110 SL by BASF Corporation – Building Systems.
- c. Flo-Top or EucoFloor SL 160 by The Euclid Chemical Co.
- d. US SPEC Self-Leveling Underlayment by US Mix Products Co.
- e. Or accepted equal.

D. Repair Mortar: Exceeds ASTM C928, R1 and R2; rapid setting – minimum 1300 psi at three hours; 5500 psi at seven days per ASTM C109.

1. Acceptable Products:

- a. MasterEmaco T 415/430 or MasterEmaco T 1060/1061 Repair Mortars by BASF Corporation – Building Systems.
- b. Euco-Speed, Versaspeed, or Speedcrete 2028 by The Euclid Chemical Co.

- c. US SPEC Transpatch by US Mix Products Co.
 - d. Or accepted equal.
- E. Repair Mortar (for patching over steel): Liquid polymer modified, containing an integral corrosion inhibitor, exceeds C928, R2; rapid setting – minimum compressive strength 1500 psi at one day; 3500 psi at seven days; 5000 psi at 28 days per ASTM C109.
 - 1. Acceptable Products:
 - a. MasterEmaco N 350CI with Acrylic Additive or MasterEmaco T 310CI by BASF Corporation – Building Systems.
 - b. Concrete-Top Supreme by The Euclid Chemical Co.
 - c. US SPEC H2 by US Mix Products Co.
 - d. Sikatop 122 Plus by Sika Corp.
 - e. Or accepted equal.
- F. Epoxy Joint Filler: Two component, 100 percent solids, semi-rigid epoxy; hardness: minimum 75 Shore A per ASTM D2240.
 - 1. Acceptable Products:
 - a. MasterSeal CR 190 by BASF Corporation – Building Systems.
 - b. Euco 700 by The Euclid Chemical Co.
 - c. Sikadur 51 NS by Sika Corp.
 - d. Or accepted equal.

1.6 ACCESSORIES

- A. Underslab Vapor Retarder, Plastic: Performance shall exceed ASTM E1745, Class A requirements, as modified below. Material properties shall match one of the acceptable products listed below.
 - 1. Properties:
 - a. Thickness: Minimum 15 mils (ACI 302.2R, as applicable).
 - b. Water Vapor Permeance (as tested before and after ASTM E1745 mandatory conditioning): Maximum 0.01 Perms (based on Test Method ASTM E1745).
 - c. Tensile Strength: Minimum 60 lbf/in (ASTM D882).
 - d. Puncture Resistance: Minimum 3000 g (ASTM D1709, Method B).
 - 2. Acceptable Products:
 - a. VaporBlock VB15 by Raven Industries.
 - b. Griffolyn® 15 Mil Green by Reef Industries, Inc.
 - c. 15 Mil Vapor Barrier by Stego Industries, LLC.
 - d. Perminator 15 Mil by W.R. Meadows, Inc.
- B. Vapor Retarder Accessories:
 - 1. Seam Tape: Water vapor transmission rate 0.03 perms or lower, per ASTM E96. Provide seam tape as standard with vapor retarder manufacturer.
 - 2. Vapor Proofing Mastic: Water vapor transmission rate 0.03 perms or lower per ASTM E96 as standard with vapor retarder manufacturer.

3. Boots for Pipe Penetrations: Provide prefabricated pipe boots as standard with vapor retarder manufacturer.
- C. Cone Hole Plugs: Precast high strength cement compound plugs matching size and shape of form tie cone and matching color of poured-in-place concrete as provided by same manufacturer of form ties. Refer to Section 03 11 00.
- D. Waterstops:
1. Flexible PVC Waterstop: CE CRD-C 572; extruded from virgin polyvinyl chloride (PVC); dumbbell profile; 6 inches long by minimum 3/8 inch thick.
 - a. Acceptable Products:
 - 1) Cat. No. 748 by Greenstreak, Inc.
 - 2) VD6-14 by Vinylex Corp.
 - 3) Or accepted equal.
 2. Provide the following waterstop accessories:
 - a. Factory fabricated corners, intersections, and directional changes. Thermally field butt splice to maintain continuity.
 - b. Hog rings or grommets spaced at 12 inches on center along length of waterstop.
- E. Capillary Barrier: Clean crushed rock; 3/4 inch nominal maximum size with no material passing a No. 4 sieve.
- F. Expansion Joints:
1. Joint-Filler Strips: ASTM D1751; bituminous type; preformed, resilient, flexible, and non-extruding.
 - a. Acceptable Product:
 - 1) Sealtight Fiber Expansion Joint by W.R. Meadows, Inc.
 - 2) Or accepted equal.
 2. Self-Leveling Polyurethane Sealant: ASTM C920; Type M; Grade P; Class 25; use T and M.
 - a. Acceptable Products:
 - 1) THC 900/901 by Tremco Inc.,
 - 2) Urexpan NR-200 by Pecora Corp.,
 - 3) MasterSeal SL2 by BASF Building Systems,
 - 4) Or accepted equal.
- G. Anchors, Anchor Bolts, Nuts, and Washers: Refer to Section 05 12 00.

1.7 PRECAST CONCRETE WHEEL STOPS

- A. Provide precast concrete wheel stops, size and shape as indicated on Drawings.
- B. Concrete: Precast, air entrained concrete with a minimum compressive strength of 2,500 psi. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

- C. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length. Provide where indicated, or as required by design condition.

1.8 CONCRETE MIX

A. General:

1. Proportion concrete design mixes per ACI 301 Section 4.2.3 and ACI 318 Section 26.4.3.
2. Proportion concrete design mixes per ACI, prepared and tested by an independent testing laboratory acceptable to Architect prior to design mix approval. For each mix design, prepare and perform tests as follows:
 - a. Drying shrinkage test per modified ASTM C157/C157M as specified in this Section; provide at least three test specimens. Drying shrinkage test not required for below grade concrete.
3. Proportioning without field experience or trial mixtures may be permitted with written approval from Architect, where concrete manufacturer can establish the uniformity of its production for concrete of similar type and strength based on recent test data in accordance with ACI 318, Chapter 26, Article 26.4.4 "Documentation of Concrete Mixture Characteristics".
4. Proportion concrete design mix to attain compressive strength as specified below and as needed, with early strength to meet Contractor's work program.

B. Mix Designs: Refer to Structural Drawings for mix design requirements.

1. Maximum Water Content: 300 pounds per cubic yard.
2. Maximum Drying Shrinkage: 0.048 percent as tested per modified ASTM C157/C157M as specified in this Section after 7 days moist curing plus 21 days drying. This requirement does not apply to below grade concrete.
3. For concrete in ACI Exposure Class C2, the maximum water-soluble chloride ion content that is contributed from the ingredients including water, aggregates, cementitious materials, and admixtures shall be determined on the concrete mixture by ASTM C1218 at age between 28 days and 42 days, and shall be less than 0.15 percent by weight of cement.
4. Unless otherwise specified for specific concrete mixes, air entrainment shall be provided for exterior concrete work exposed to freeze-thaw cycles only, such as, site concrete, including pavements, curbs, and gutters.

C. Admixtures:

1. Use specified admixtures as acceptable to Architect. Verify compatibility of concrete admixtures when using multiple admixtures.
2. Integral Colored Concrete: Add color admixture at batch plant according to manufacturer's written instructions. Mix until color additives are uniformly dispersed throughout mixture. Maintain concrete design mix materials and proportion for color consistency.

1.9 CONCRETE MIXING

- ### A. Concrete shall be mixed per ACI 304R.

1.10 SOURCE QUALITY CONTROL

A. Owner shall employ a testing laboratory accepted by Architect to perform the following:

1. Review mix designs and certificates of compliance for materials Contractor proposes to use.

END OF SECTION

SECTION 03 35 19
COLORED CONCRETE FINISHING

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. L.M. Scofield Company, Douglasville, GA; 800-800-9900, www.scofield.com. Local Contact: West/South Division Office 323-720-3000. Products:

1. Lithochrome® Chemstain Classic. Colors as selected by Architect.
2. Selectseal-W Clear Sealer.

B. The Bomanite Company, Granite Bay, CA; 303-369-1115, www.bomanite.com.

1.2 ACCESSORIES

A. Curing Paper: Fortifiber Seekure, a nonstaining glass reinforced kraft paper.

1.3 MATERIALS

A. All materials shall be provided from a single manufacturer unless noted otherwise in this Section.

B. The chemical stain shall be an acidic, water-based solution of metallic salts that penetrate and react with chemicals in cured concrete to produce insoluble color deposits in the concrete matrix. The formulation shall contain no pigments or resins.

C. The sealer shall be a clear, one-component, water-based, acrylic-polyurethane solution.

D. Topcoat/wear surface shall be Johnson Diversey Carefree Floor Sealer/Finish or accepted equal.

1.4 CONCRETE MIX DESIGN

A. Refer to Section 03 30 00.

B. Do not add calcium chloride to mix as it causes mottling and surface discoloration.

C. Supplemental admixtures shall not be used unless approved by manufacturer.

END OF SECTION

SECTION 03 35 23

EXPOSED AGGREGATE CONCRETE FINISHING

PART 1 PRODUCTS

1.1 CONCRETE MATERIALS

- A. Cement, Water, and Admixtures: As specified in Section 03 30 00.
- B. Water: Potable, not detrimental to concrete.
- C. Decorative Exposed Aggregate: Type, size, and color as selected by Architect.

1.2 ACCESSORY MATERIALS

- A. Surface Retarder: Retarder shall be in compliance with the California Air Resources Board (CARB) VOC limit requirements in the County of Solano.
 - 1. Acceptable Manufacturers:
 - a. Grace Construction Products, Product: Grace Top-Cast.
 - b. The Euclid Chemical Company, Product: Euco Concrete Surface Retarder, Formula S.
 - c. Fritz-Pak Corporation, Product: Expo-Rock.

1.3 CONCRETE MIX

- A. Utilize concrete mix design specified in Section 03 30 00. Specified aggregate shall be incorporated into the mix design.

1.4 SOURCE QUALITY CONTROL

- A. Provide testing and analysis of concrete mix design.
- B. Test samples in accordance with Section 03 30 00.

END OF SECTION

SECTION 03 35 46
SEALED CONCRETE FINISHING

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

- A. Manufacturers and products are the Basis of Design for the sealed concrete finishing system and are listed to establish minimum requirements as to quality and performance.
- B. Concrete Sealer/Hardener Treatment:
 - 1. Ashford Formula by Curecrete Distribution, Inc., Springville, UT; 800-998-5664, www.ashfordformula.com. Northern California Representative – Stephen Gamble; phone: 916-334-0355; fax: 916-344-3517.
 - 2. or accepted equal.
- C. Concrete Sealer:
 - 1. Retro Guard by Advanced Floor Products, Provo, UT; 801-812-3420, www.retroplatesystem.com. Northern California Representative – Stephen Gamble; phone: 916-334-0355; fax: 916-344-3517.
 - 2. or accepted equal.
- D. Floor Protection:
 - 1. The System with EZ Cover as manufactured by McTech group, Inc., Loganville, GA; 866-913-8363, www.mctechgroup.com. System shall be breathable and biodegradable.
 - 2. or accepted equal.

1.2 RELATED MATERIALS

- A. Water: Potable.

1.3 FINISH

- A. Hard steel troweled concrete slab.

END OF SECTION

SECTION 04 21 13
CLAY UNIT MASONRY

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers, Clay Masonry Units:

1. H.C. Muddox, Sacramento, CA; 800-776-1244 or 916-368-4567, www.hcmuddox.com.
Product: Atlas Hollow Brick.
2. Interstate Brick, West Jordan, UT; 800-233-8654 or 801-280-5200,
www.interstatebrick.com.

B. Acceptable Manufacturers, Precast Concrete Sills and Caps:

1. Basalite Block Company, Inc.
2. Thunderstone.
3. Napa Cast Stone.
4. Cast Stone Systems.

1.2 CLAY MASONRY UNITS

A. Hollow Brick Load Bearing Units: ASTM C652, Grade SW, Type HBS or better.

1. Provide open and closed-end units, bond beams, U beams, half units and any additional special shapes and sizes as required to complete the Work.
2. Units shall be of the following type: Standard smooth finish with two good faces, sizes as indicated on Drawings; color as selected by Architect.

B. Facing Brick Load Bearing Units: ASTM C216, Grade SW, Type FBS or better.

1. Provide full and half units and any additional special shapes and sizes as required to complete the Work.
2. Units shall be of the following types:
 - a. Standard smooth finish on exposed faces, sizes as indicated on Drawings; color as selected by Architect.

1.3 MORTAR AND GROUT

A. Portland Cement: ASTM C150, Type I or II, low alkali. Masonry cement will not be permitted.

B. Aggregate:

1. For Mortar: ASTM C144.
2. For Grout: ASTM C404.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and potable, free from impurities detrimental to mortar and grout.

E. Admixtures:

1. Unless otherwise specified, use admixtures only with Architect's acceptance and without adversely affecting bond or compressive strength.
2. Grout Additive: Grout pours greater than five feet-four inches shall contain "Grout Aid" by Sika Chemical Corporation or "Pre-Mix Products Grout Additive" by Valley Abrasive Shot, Inc.
 - a. Mix grout additive as recommended by manufacturer.

F. Provide integral water repellent admixture in mortar mix. Mixing and proportions shall be in strict accordance with water repellent manufacturer's printed instructions.

G. Mortar Color: As selected by Architect.

1.4 REINFORCEMENT, ACCESSORIES, AND RELATED ITEMS

A. Steel reinforcement including anchors, ties and accessories: shall conform to CBC Section 2103.14 "Metal Reinforcement and Accessories."

B. Reinforcing Steel: Refer to Section 03 20 00.

C. Wire Ties: No. 16 annealed wire for tying reinforcing steel.

D. Wire Joint Reinforcement: 9 gauge continuous wire in joint.

E. Bonding Agent: MasterEmaco ADH 326 two-component 100 percent solids liquid epoxy bonding adhesive in compliance with ASTM C881, Type II, Grade 2, Class C as manufactured by Master Builders Solutions/BASF, or accepted equal.

F. Control Joints: Closed cell neoprene rubber conforming to ASTM D1056, Grade 2A1. 3/8 inch thick by 3 inches wide. Product: Rapid Expansion Joint DA2015 as manufactured by Dur-O-Wal, a Hohmann & Barnard Company, Hauppauge, NY; 800.645.0616, www.dur-o-wal.com, or accepted equal.

1.5 PRECAST CONCRETE SILLS AND CAPS

A. Precast Concrete Sills and Caps: Sizes and profiles as indicated on Drawings.

B. Provide precast units complying with ASTM C1364 using either the vibrant dry tamp or wet-cast method.

C. Provide integral water repellent admixture in mortar mix. Mixing and proportions shall be in strict accordance with water repellent manufacturer's printed instructions.

D. Fabricate units with sharp arrises and accurately reproduced details, with indicated texture on all exposed surfaces.

E. Fabrication Tolerances:

1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.

1.6 MIXES AND MIXING

A. Mortar:

1. Meet the requirements of CBC Section 2103.2 and ASTM C270.
 - a. Compressive Strength: 1,800 psi minimum at 28 days.
 - b. Proportions by volume: 1 part Portland cement, 1/2 part hydrated lime, and 4-1/2 parts sand based on dry loose volume.
2. Mortar shall be mixed as follows, with a total mixing time not less than ten minutes.
 - a. Place approximately half of required water and sand into mixer while running.
 - b. Add cement and remainder of sand and water into mixer in that order and mix for a period of at least two minutes.
 - c. Add lime and continue mixing as long as needed to secure a uniform mass.
3. Use and place mortar in final position within 2-1/2 hours after mixing. Mortars that have stiffened due to evaporation of water may be re-tempered with water as necessary to restore required consistency during that time period.

B. Grout:

1. Grout shall conform to the requirements of TMS 602 and shall be a coarse grout designed to attain a compressive strength of not less than 2,000 psi at 28 days.
2. Proportions: Grout shall be proportioned as specified by one of the following methods:
 - a. Based on proportions specified in ASTM C476.
 - b. Based on laboratory or field experience with the grout ingredients and the masonry units to be used.
 - 1) For coarse grout, the coarse and fine aggregates shall be combined such that the fine aggregate part is not greater than 80 percent of the total aggregate weight (mass). Coarse grout proportioned by weight shall contain not less than 564 pounds of cementitious material per cubic yard.
 - 2) If this method is selected, Contractor shall submit documented history of grout mix design and results of test data used to establish mix proportions from no less than ten different recent projects.
 - 3) Compressive strength shall be determined in accordance with ASTM C1019.
3. Aggregate for grout shall conform to the requirements set forth in ASTM C404, Aggregates for Grout. Coarse grout shall be used in grout spaces 2 inches or more in width and in all filled-cell masonry construction.
4. Materials for grout shall be measured in suitable calibrated devices. After the addition of water, all materials shall be mixed for at least three minutes in a drum type batch mixer. Mixing equipment and procedures shall produce grout with the uniformity required for concrete by ASTM C94.

1.7 SOURCE QUALITY CONTROL

A. Where required by governing code, Owner's Testing Agency will:

1. Select masonry units by random sampling at the plant and test units for strength, absorption, and moisture content in accordance with ASTM C140; report strengths based on net area.

2. Review mix designs for mortar and grout.
3. Review certificates of compliance for materials. Sample and test where non-conformance is suspected.
4. Perform masonry and grout tests.

END OF SECTION

SECTION 04 21 13.13
BRICK VENEER MASONRY

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Acceptable Manufacturers:
1. H.C. Muddox Company, Inc.
 2. McNear Brick and Block.
 3. Interpace Industries, Inc.
 4. Endicott Brick, Inc.

1.2 BRICK MASONRY UNITS

- A. Face Brick: ASTM C216, Grade SW, Type FBX, maximum saturation coefficient of 0.78. Units shall be as follows:
1. Size as selected by Architect.
 2. Color and texture as selected by Architect.

1.3 MORTAR AND MORTAR MATERIALS:

- A. Type S mortar shall be used. Proportions shall be 1.0 cubic foot Portland cement, 0.25 cubic foot to 0.50 cubic foot hydrated lime or lime putty, 2.25 cubic feet to 3 cubic feet aggregate (sand), damp and loose.
1. Mortar shall conform to the requirements of ASTM C270.
 2. Cement shall conform to "Standard Specifications for Portland Cement", ASTM C150 Type I, as last amended and shall comply with the requirements for total alkali percentage as set forth in the "Standard methods of Chemical Analysis of Portland Cement," ASTM C114.
 3. Hydrated Lime shall conform to Type S hydrated lime as given in "Standard Specifications for Hydrated Lime for Masonry Purposes," ASTM C207.
 4. Sand used in mortar shall conform to "Standard Specifications for Aggregate for Masonry Mortar," ASTM C144-52T, except that not less than 3 percent shall pass the No. 100 sieve.
 5. Lime putty shall be mixed with approximately 6-1/4 gallons of water per 50 pound bag of lime. Putty may be machine mixed and used immediately or soaked and used the next day.
 - a. Quick lime shall conform to the "Standard Specifications for Quick Lime for Structural Purposes," ASTM C5.

1.4 WATER

- A. Water used in mortar shall be taken from a supply distributed for domestic purposes, and at the time of mixing shall be clean and free of deleterious amounts of acids, alkalis, and organic materials.

1.5 MASONRY ACCESSORIES

A. Masonry Anchor System:

1. Dur-O-Wall, Product: D/A 901 slotted channels with D/A 931 seismic channel slot anchors.
2. Halfen Anchoring Systems, Product: Fleming Masonry Anchoring System.

B. Through Wall Base Flashing: Perm-a-Barrier wall flashing by W.R. Grace or accepted equal.

END OF SECTION

SECTION 04 22 00
CONCRETE UNIT MASONRY

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers, Concrete Masonry Units (CMU):

1. Basalite Block Company, Inc., Dixon, CA; 800-776-6690, 707-678-1901, www.basalite.com.
2. Calstone Company, Sunnyvale, CA; 408-984-8800, www.calstone.com.
3. Angelus Block Co., Inc., Sun Valley, CA; 818-767-8576, www.angelusblock.com.

B. Acceptable Manufacturers and Products, Integral Water Repellent for CMU and Mortar:

1. Grace Construction Products, W. R. Grace & Co. - Conn.; "Dry-Block Block Admixture" for CMU; "Dry-Block Mortar Admixture" for mortar.
2. ACM Chemistries, Inc.; "RainBloc" for CMU, and "RainBloc for Mortar" for mortar.
3. BASF Aktiengesellschaft; Rheopel Plus for CMU; Rheopel Mortar Admixture for mortar and grout.

C. Acceptable Manufacturers, Precast Concrete Sills and Caps:

1. Bertelson Precast.
2. Basalite Block Company, Inc.
3. Napa Cast Stone.
4. Cast Stone Systems.
5. Thunderstone, Lincoln, NE; 402-420-2322, www.thunderstone.com.

1.2 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Units: ASTM C90, maximum oven dry density of 135 pounds per cubic foot, 2000 pounds per square inch minimum compressive strength. Provide open and closed-end units, bond beams, U beams, half units and any additional special shapes and sizes as required to complete the Work. Units shall be of the following types:

1. Standard:
 - a. Smooth finish, sizes as indicated on Drawings; colors as selected by Architect.
 - b. Split-face texture one side and exposed ends, sizes as indicated on Drawings; colors as selected by Architect.
2. Insulated:
 - a. Precision smooth finish double open ended units to receive specified insulation, sizes as indicated on Drawings; colors as selected by Architect.
 - b. Split-face texture one side and exposed ends, double open ended units to receive specified insulation, sizes as indicated on Drawings; colors as selected by Architect.

B. Provide integral water repellent admixture in concrete mix during manufacture of concrete masonry units. Mixing and proportions shall be in strict accordance with water repellent manufacturer's printed instructions.

1.3 MORTAR AND GROUT

- A. Portland Cement: Type I or II. Masonry cement will not be permitted.
- B. Aggregate:
 - 1. For Mortar: ASTM C144.
 - 2. For Grout: ASTM C404.
- C. Hydrated Lime: Type S, ASTM C207.
- D. Quick Lime: ASTM C5.
- E. Water: Clean and potable, free from impurities detrimental to mortar and grout.
- F. Admixtures:
 - 1. Unless otherwise specified, use admixtures only with Architect's acceptance and without adversely affecting bond or compressive strength.
 - 2. Grout Additive: Grout pours greater than five feet-four inches shall contain "Grout Aid" by Sika Chemical Corporation or "Pre-Mix Products Grout Additive" by Valley Abrasive Shot, Inc.
 - a. Mix grout additive as recommended by manufacturer.
- G. Provide integral water repellent admixture in mortar mix. Mixing and proportions shall be in strict accordance with water repellent manufacturer's printed instructions.
- H. Color of mortar as selected by Architect.

1.4 REINFORCEMENT, ACCESSORIES, AND RELATED ITEMS

- A. Steel reinforcement including anchors, ties and accessories: shall conform to CBC Section 2103.4 "Metal Reinforcement and Accessories."
- B. Reinforcing Steel: Same type and quality specified for concrete reinforcing, Section 03 20 00.
- C. Wire Ties: No. 16 annealed wire for tying reinforcing steel.
- D. Wire Joint Reinforcement: 9 gauge continuous wire ladder in joint.
- E. Bonding Agent: MasterEmaco ADH 326 two-component 100 percent solids liquid epoxy bonding adhesive in compliance with ASTM C881, Type II, Grade 2, Class C as manufactured by Master Builders Solutions/BASF, or accepted equal.
- F. Control Joints: Closed cell neoprene rubber conforming to ASTM D1056, Grade 2A1. 3/8 inch thick by 3 inches wide. Product: Rapid Expansion Joint DA2015 as manufactured by Dur-O-Wal, a Hohmann & Barnard Company, Hauppauge, NY; 800.645.0616, www.dur-o-wal.com, or accepted equal.
- G. Insulation: Korfil Hi-R-H (ICC ESR-3508) as manufactured by Concrete Block Insulating Systems, Inc. or accepted equal, with the following characteristics:
 - 1. Material: Expanded polystyrene, conforming to ASTM C578, Type X for use in 12 inch wide concrete masonry units.
 - 2. Density: 1.3 pounds per cubic foot minimum per ASTM C303.

3. Thermal Resistance: R-5 per inch of thickness at 75 degrees F.
4. Moisture Absorption: Less than 1.0 percent by volume per ASTM C272.
5. Flame Spread: Less than 5.0 per ASTM E84.

1.5 PRECAST CONCRETE SILLS AND CAPS

- A. Precast Concrete Sills and Caps: Sizes and profiles as indicated on Drawings.
- B. Provide precast units complying with ASTM C1364 using either the vibrant dry tamp or wet-cast method.
- C. Provide integral water repellent admixture in concrete mix. Mixing and proportions shall be in strict accordance with water repellent manufacturer's printed instructions.
- D. Fabricate units with sharp arrises and accurately reproduced details, with indicated texture on all exposed surfaces.
- E. Fabrication Tolerances:
 1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
 2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
 3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.

1.6 MIXES AND MIXING

- A. Mortar:
 1. Meet the requirements of CBC Section 2103.2 and ASTM C270.
 - a. Compressive Strength: 1,800 psi at 28 days.
 - b. Proportions by volume: One part Portland cement, 2.25 parts to 3 parts sand based on damp loose volume, and not less than a quarter and not more than half part lime.
 2. Mortar shall be mixed as follows, with a total mixing time not less than ten minutes.
 - a. Place approximately half of required water and sand into mixer while running.
 - b. Add cement and remainder of sand and water into mixer in that order and mix for a period of at least two minutes.
 - c. Add lime and continue mixing as long as needed to secure a uniform mass.
 3. Use and place mortar in final position within 2-1/2 hours after mixing. Mortars that have stiffened due to evaporation of water may be re-tempered with water as necessary to restore required consistency during that time period.
- B. Grout:
 1. Grout shall conform to the requirements of TMS 602 and shall be a coarse grout designed to attain a compressive strength of not less than 2,000 psi at 28 days.
 2. Proportions: Grout shall be proportioned as specified by one of the following methods:
 - a. Based on proportions specified in ASTM C476.
 - b. Based on laboratory or field experience with the grout ingredients and the masonry units to be used.

- 1) For coarse grout, the coarse and fine aggregates shall be combined such that the fine aggregate part is not greater than 80 percent of the total aggregate weight (mass). Coarse grout proportioned by weight shall contain not less than 564 pounds of cementitious material per cubic yard.
- 2) If this method is selected, Contractor shall submit documented history of grout mix design and results of test data used to establish mix proportions from no less than ten different recent projects.
- 3) Compressive strength shall be determined in accordance with ASTM C1019.
3. Aggregate for grout shall conform to the requirements set forth in ASTM C404, Aggregates for Grout. Coarse grout shall be used in grout spaces 2 inches or more in width and in all filled-cell masonry construction.
4. Materials for grout shall be measured in suitable calibrated devices. After the addition of water, all materials shall be mixed for at least three minutes in a drum type batch mixer. Mixing equipment and procedures shall produce grout with the uniformity required for concrete by ASTM C94.

1.7 SOURCE QUALITY CONTROL

A. Where required by governing code, Owner's Testing Agency will:

1. Select masonry units by random sampling at the plant and test units for strength, absorption, and moisture content in accordance with ASTM C140; report strengths based on net area.
2. Review mix designs for mortar and grout.
3. Review certificates of compliance for materials. Sample and test where non-conformance is suspected.
4. Perform masonry and grout tests.

END OF SECTION

SECTION 04 22 00.13
CONCRETE UNIT VENEER MASONRY

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Basalite Block Company, Inc., Dixon, CA; 800-776-6690, 707-678-1901, www.basalite.com.
2. Calstone Company, Sunnyvale, CA; 408-984-8800, www.calstone.com.
3. Angelus Block Co., Inc., Sun Valley, CA; 818-767-8576, www.angelusblock.com.

1.2 MASONRY UNITS

A. Solid Concrete Block Units: ASTM C90, lightweight or mediumweight. Units shall be as follows:

1. Smooth faces, single score, 4 inches x 8 inches x 16 inches size, Colors as selected by Architect.

1.3 MORTAR

A. Type S mortar shall be used. Proportions shall be 1.0 cubic foot Portland cement, 0.25 cubic foot to 0.50 cubic foot hydrated lime or lime putty, 2.25 cubic feet to 3 cubic feet aggregate (sand), damp and loose.

B. Mortar shall conform to the requirements of ASTM C270 and grout shall conform to the requirements of ASTM C476.

C. Cement: ASTM C150 Type I, and shall comply with the requirements for total alkali percentage as set forth in ASTM C114.

D. Hydrated Lime: ASTM C207, Type S.

E. Sand: Conform to ASTM C144, except that not less than three percent shall pass the No. 100 sieve.

F. Lime putty shall be mixed with approximately 6-1/4 gallons of water per 50 pound bag of lime. Putty may be machine mixed and used immediately or soaked and used the next day.

1. Quick lime shall conform to ASTM C5.

G. Admixture, Grout Additive: All grout shall contain "Grout Aid" as manufactured by Sika Chemical Corp or "Pre-Mix Products Grout Additive" as manufactured by Valley Abrasive Shot, Inc. Mix Grout Additive as recommended by the manufacturer.

H. Color of mortar as selected by Architect.

1.4 WATER

A. Water used in mortar and grout shall be clean and potable, free from impurities detrimental to mortar and grout.

1.5 MASONRY ACCESSORIES

A. Masonry Anchor System:

1. Dur-O-Wall, Product: DA901 slotted channels with DA931 seismic channel slot anchors.
2. Halfen Anchoring Systems, Product: Fleming Masonry Anchoring System.

B. Control Joints: Closed cell neoprene rubber conforming to ASTM D1056, Grade 2A1. 3/8 inch thick by 3 inch wide.

1. Product: Rapid Expansion Joint DA2015 as manufactured by Dur-O-Wal, a Hohmann & Barnard, Inc., Hauppauge, NY; 800-645-0616, www.dur-o-wal.com, or accepted equal.

C. Through Wall Base Flashing: Perm-a-Barrier wall flashing by W.R. Grace or accepted equal.

END OF SECTION

SECTION 04 42 00

EXTERIOR NATURAL STONE CLADDING

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Rolleri Landscape Products, 1142 Murphy's Grade Road, Angels Camp, CA 95222, Phone: 209-736-0381, Fax: 209-736-4154, URL: <http://www.rolleri-landscape-products.com>, Product: White Marble with gray vanes and gray limestone.
- B. The Decorative Rock Network, Inc., 7641 East Highway 12, Wallace, CA 95254, Phone: 209-763-5099, URL: <http://www.decorock.com>.
- C. Oasis Stone Company, P.O. Box 586, Windsor, CA 95492, Phone: 888-785-1222, Fax: 707-431-1681, URL: <http://www.oasisstonecompany.com>.
- D. Kettle Valley Stone Company, 204 Cambro Road, Kelowna, BC, Canada V1X 7T3, Phone: 877-670-7625, URL: <http://www.kettlevalleystone.com>.
- E. Telluride Stone Company, 3975 York Street, Denver, CO 80205, Phone: 303-388-8863, Fax: 303-759-5735, URL: <http://www.telluridestone.com>.

1.2 MORTAR AND MORTAR MATERIALS

- A. Portland Cement: ASTM C150, Type II, low alkali, gray color.
- B. Sand: Comply with ASTM C144, with not less than five percent passing the No. 100 sieve.
- C. Lime: ASTM C207, Type S.
- D. Iron oxide pigments.

1.3 ACCESSORIES

- A. Water Repellent: Refer to Section 07 19 00.

END OF SECTION

SECTION 04 73 00
MANUFACTURED STONE MASONRY

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Creative Mines, San Diego, CA; 800-453-7040, www.creativemines.us.
- B. Eldorado Stone, San Marcos, CA; 800-925-1491, www.eldoradostone.com.
 - 1. Profile: As selected by Architect.
 - 2. Color: As selected by Architect.
 - 3. Shapes: Flat and Corners.
- C. Coronado Stone Products, Fontana, CA; 800-847-8663, www.coronado.com.
- D. Boral Material Technologies Cultured Stone, Roswell, GA; 770-645-4500, www.boralna.com.
- E. Daltile Manufactured Stone, Dallas, TX; 214-398-1411, www.daltilemanufacturedstone.com.

1.2 STONE VENEER

- A. Stone veneer units shall consist of Portland cement, lightweight aggregates, and mineral oxide pigments. Properties:
 - 1. Compressive strength per ASTM C39 and ASTM C192, five sample average: Greater than 1,800 psi.
 - 2. Shear bond per ASTM C482: 50 psi.
 - 3. Thermal Resistance per ASTM C177: 0.473 at 1.387 inch thickness.
 - 4. Water absorption per ICC Evaluation service AC 51: Less than 22 percent when density is less than 85 pounds per cubic foot; less than 18 percent when density is less than 105 pounds per cubic foot.
 - 5. Freeze-thaw test per ASTM C67: Less than three percent weight loss and no disintegration.

1.3 MORTAR AND MORTAR MATERIALS

- A. Portland Cement: ASTM C150, Type II, low alkali, gray color.
 - 1. Option: ASTM C91 Type N or Type S masonry cement.
- B. Sand: Comply with ASTM C144, with not less than five percent passing the No. 100 sieve.
- C. Lime: ASTM C207.
 - 1. Lime is not required when using Type N or Type S masonry cement.
- D. Color Pigment: ASTM C979, mineral oxide pigments.
- E. Water: Potable.

1.4 ACCESORIES

- A. Weather-Resistant Barrier and Accessories: Refer to Division 07.
- B. Metal Lath: Self furred, grooved, galvanized expanded metal flat diamond mesh; weighing 3.4 pounds per square yard; continuous horizontal grooves 1/4 inch deep at 6-3/16 inches on center as manufactured by ClarkDietrich Building Systems, Cemco, Amico or accepted equal.
 - 1. Acceptable Alternative Metal Lath: Structa Mega Lath as manufactured by Structa Wire Corporation with the following characteristics:
 - a. Weight: 1.95 pounds per square yard.
 - b. No. 17 gauge x No. 16 gauge galvanized cold-rolled steel wire welded to form 0.7 inch x 1.5 inch openings.
 - c. Six secondary cold-rolled flat longitudinal wires spaced nominally every 5-3/8 inches to form a twin track.
 - d. Furring:
 - 1) Width of Furring Leg: 1/4 inch.
 - 2) Furring Height: 1/4 inch to underside of cross wire.
 - 3) Furring Spacing: 2-1/8 inch on center.
 - 4) Every cross wire is furred.
- C. Anchorages at Metal Framing: Install galvanized # 8 wafer head screws at 6 inches on center vertically at each stud x length as required for 3/8 inch penetration into framing members.
 - 1. ASTM C954, self-drilling and self-tapping screws for heavy gauge steel framing (0.033 inch to 0.112 inch thick).
 - 2. ASTM C1002, self-drilling and self-tapping screws for light gauge steel framing (less than 0.033 inch thick).
- D. Bonding Agent: Exterior integral bonding agent complying with ASTM C932 or ASTM C1059, Type II.
- E. Masonry Sealer: Refer to Section 07 19 00.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 PRODUCTS

1.1 MATERIALS

A. Structural Steel Members:

1. ASTM A992 Grade 50 for wide flange and WT shapes.
2. ASTM A36/A36M or A572 Grade 50 for plates, as noted on Drawings.
3. ASTM A36/A36M for channels, angles and all other shapes.

B. HSS:

1. Tubing: ASTM A500, Grade B.
2. Round: ASTM A500, Grade B.

C. Pipe: ASTM A53/A53M, Type E or S, Grade B.

D. Bolts and Nuts: ASTM A307, Grade A, with ASTM A563, Grade A, hex nuts, ASTM A325N, Type 1, with ASTM A563, Grade C, heavy hex nuts; anchor bolts, ASTM F1554, grade as indicated on Drawings.

E. High-Strength Bolts, Nuts, and Washers: ASTM A325, Type 1, heavy hex steel structural bolts; ASTM A563 heavy hex carbon-steel nuts.

F. High-Strength Bolts, Nuts, and Washers: ASTM A490, Type 1, heavy hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers, plain.

G. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F1852, Type 1, heavy hex head or round head steel structural bolts with splined ends; ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.

H. Welding Materials:

1. Typical Weld Locations: AWS D1.1; type required for materials being welded.
2. SFRS and Demand Critical Welds: AWS D1.8; filler metal shall be classified as low hydrogen and shall have a minimum Charpy V-notch toughness of twenty foot-pounds at 0 degrees F for SFRS welds and forty foot-pounds at 70 degrees F for Demand Critical Welds as determined by AWS classification or manufacturer certification. Demand critical weld material shall also meet heat input testing requirements of AWS D1.8, Clause 6.3.

I. Circular washers for common bolts: ASTM F844, Type A, and ANSI B18.22.1.

J. Beveled washers for common bolts: ANSI B18.23.1.

K. Washers for high strength bolts: Direct tension indicator. ASTM F959 hardened circular, beveled and clipped, ASTM F436.

L. Post-Installed Concrete Anchors: I.C.C. approved, as indicated and manufactured by Hilti or accepted equal.

- M. Eye Bolts and Nuts: ASTM A108, Grade 1030, cold-finished carbon steel.
- N. Sleeve Nuts: ASTM A108, Grade 1018, cold-finished carbon steel.
- O. Welded Headed Stud Anchors: ASTM A108. Welding, testing and inspection shall be in accordance with AWS D1.1.
- P. Steel Shop and Touch-Up Primer: TNEMEC Series 115 Uni-Bond DF or accepted equal.
- Q. Shop and Touch-Up Zinc Rich Primer for Galvanized Surfaces: ZRC Galvilitite Galvanizing Repair Compound as manufactured by ZRC Worldwide Company, Phone: (800) 831-3275, or accepted equal.
- R. Weld filler material: All weld filler material shall have a minimum tensile strength of 70 KSI per AWS D1.1, latest edition approved by code enforcement agency.
- S. Drypack: Refer to Section 03 30 00.
- T. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- U. Reinforcing Steel: Refer to Section 03 20 00.

1.2 FABRICATION

- A. General: Fabricate items of structural steel in accordance with AISC specifications and as indicated on Drawings. Properly mark and match-mark all materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling.
 - 1. Welded splicing of structural members may be done only upon written acceptance by Architect, unless otherwise indicated on Drawings. Splicing shall be thoroughly examined by a nondestructive means at Contractor's expense. Inspection shall be made by a recognized and approved testing laboratory; procedure, technique and standards of acceptance shall conform to Appendix E of AWS Standard D2.0-69. Correct faulty welds and re-examine in a manner specified for original welds.
- B. Welded Construction:
 - 1. Weld in accordance with AISC using manual shielded arc method or flux cored arc method in accordance with AWS D1.1 and AWS D1.8. Groove welds shall be complete joint penetration welds, unless specifically designated otherwise on Drawings.
 - 2. Remove back-up plates for complete joint penetration welds when specifically requested by testing laboratory to perform non-destructive testing. Remove at no cost to Owner.
 - 3. Weld reinforcing steel in accordance with AWS D1.4 and using prequalified procedures.
- C. Connections:
 - 1. Weld or bolt shop connections as indicated.
 - 2. Bolt field connections except where welded or other connections are indicated. Provide unfinished threaded fasteners only where noted on Drawings and for temporary bracing to facilitate erections.

- D. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for the passage of work through steel framing members as indicated. Provide threaded nuts welded to framing, and other specialty items as shown to receive other work. Cut, drill or punch holes perpendicular to metal surfaces. Thermally cut holes are only permitted at anchor rod holes.

1.3 FINISHES

- A. Prepare structural component surfaces in accordance with SSPC SP-2 at concealed locations and SSPC SP-6 at exposed locations. Provide Class "A" (clean mill scale) contact surfaces per RCSC 2009 at high-strength bolted connections.
- B. Do not prime surfaces scheduled to receive fireproofing, in direct contact with concrete, where field welding is required, or contact surfaces of steel-to-steel connections. Provide Class "A" or better contact surfaces at steel connections per RCSC Specification for Structural Joints Using High Strength Bolts, latest edition.
- C. All exposed interior steel and all interior steel scheduled to receive intumescent mastic fireproofing shall be primed with shop primer unless otherwise noted.
1. Primer shall be applied in one coat, to meet or exceed the minimum mil thickness required by the primer manufacturer.
- D. All un-exposed, concealed or enclosed interior or exterior steel requires no finish.
- E. All exposed exterior steel shall be galvanized unless otherwise noted.
1. Galvanize in accordance with ASTM A123/A123M, designated steel items. Provide minimum 1.25 ounce per square foot galvanized coating.
 2. At galvanized members, touch-up all welds with zinc-rich primer.
- F. Column Bases: Column bases and base plates shall be finished in accordance with the following requirements:
1. Steel bearing plates 2 inches or less in thickness are permitted without milling provided a smooth and notch-free contact bearing surface is obtained. Steel bearing plates over 2 inches but not over 4 inches in thickness are permitted to be straightened by pressing or, if presses are not available, by milling for bearing surfaces, except as stipulated in subparagraphs (2) and (3) below, to obtain a smooth and notch-free contact bearing surface. Steel bearing plates over 4 inches in thickness shall be milled for bearing surfaces, except as stipulated in subparagraphs (2) and (3) below.
 2. Bottom surfaces of bearing plates and column bases that are grouted to ensure full bearing contact on foundations need not be milled.
 3. Top surfaces of bearing plates need not be milled when complete-joint-penetration groove welds are provided between the column and the bearing plate.

1.4 TESTING AND INSPECTION

- A. General: Owner will engage and pay a testing agency to perform the following services:
1. Review manufacturer's certificates and check heat numbers and that the steel is properly identified in accordance with CBC Section 2203 "Identification and Protection of Steel for Structural Purposes".
 2. Testing of unidentified materials or as directed by Owner.

3. Provide inspection per CBC Sections 1705.2 and 1705.12.
4. Provide testing per CBC Section 1705.13.
5. In the event an examination discloses faulty welds and additional tests are required to fully examine the welds, the cost of the additional tests shall be paid for by Owner and back-charged to Contractor.
6. All defective welds shall be repaired and tested at no expense to Owner.
7. Perform any physical tests of structural steel as required by Architect. Perform ultrasonic tests on members as determined by Architect to determine if delamination defects in steel members are evident.
8. High-strength bolting testing and inspection shall conform to the following requirements:
 - a. Perform pre-installation verification of pretensioned bolts per RCSC Section 7.1 for the selected pretensioning method.
 - b. Inspect bolted joints per RCSC Section 9 and CBC Section 1705.2.1.
 - c. All fasteners failing to meet the specified tension shall be examined to determine the cause of failure and re-tested.

END OF SECTION

SECTION 05 12 13

ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

PART 1 PRODUCTS

1.1 MATERIALS

- A. Structural Steel Members, Connections, and Welds: As indicated on Drawings and as specified in Section 05 12 00.

1.2 PRIMER

- A. General: Primers shall be compatible with finish paint systems specified for AESS surfaces.
- B. Steel Shop and Touch-Up Primer:
1. Provide compatible ferrous metal primers as specified in Section 09 91 00, or accepted equal, as standard with the fabricator.
 2. Primer: SSPC-Paint 25, Type I or Type II, zinc oxide, alkyd, linseed oil primer. Type I Primer requires SSPC-SP 2 surface preparation or better and 24 hours' drying before recoating. Type II has lower VOC content than Type I.
 3. Primer: SSPC-Paint 25 BCS, Type I or Type II, zinc oxide, alkyd, linseed oil primer. Type I Primer requires SSPC-SP 6/NACE No. 3 commercial blast-cleaning surface preparation or better and 24 hours' drying before recoating. Type II has lower VOC content than Type I.
 4. Primer: SSPC-Paint 23, latex primer. Latex primer requires SSPC-SP 6/NACE No. 3 commercial blast-cleaning surface preparation or better and 24 hours' drying before recoating. SSPC recommends two primer coats before exposing steel to exterior; and one or two topcoats.
 5. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting, alkyd metal primer, compatible with topcoat. Verify if primers meet limitations and characteristics listed above. Fabricator's standard primer requires SSPC-SP 2 surface preparation or better; and usually provides minimal protection.
 6. Primer for steel members indicated to receive intumescent fireproofing, shall be compatible with intumescent fireproofing materials.
- C. Galvanized Steel Shop and Touch-Up Primer: Galvanized metal primers as listed below.
1. Etching Cleaner for Galvanized Metal: Suitable for removal of grease and oil residue from metal surfaces.
 2. Galvanizing Repair Paint: Single component organic zinc rich primer, inorganic zinc rich primer, or SSPC-Paint 20 or ASTM A780.
 3. Shop Primer for Galvanized Steel: Cementitious galvanized metal primer, or vinyl wash primer, or water-based galvanized metal primer, as suitable for finish coats.
 4. Primer for galvanized steel members indicated to receive intumescent fireproofing, shall be compatible with intumescent fireproofing materials.

1.3 FABRICATION

- A. General: Shop fabricate and assemble AESS to the maximum extent possible. Locate field joints at concealed locations if possible. Detail assemblies to minimize handling and to expedite erection.
- B. Fabrication shall comply with the requirements of AISC 303 for the applicable AESS category.

1.4 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123/A123M.
 - 1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
 - 2. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
 - 3. Galvanize lintels, shelf angles, and similar members attached to structural-steel frame and located in exterior walls.

1.5 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials.
 - 5. Galvanized surfaces.
- B. Preparing Galvanized Steel for Shop Priming: After galvanizing, thoroughly clean steel of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at the rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

END OF SECTION

SECTION 05 21 00
STEEL JOIST FRAMING

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Acceptable Manufacturer: Vulcraft Corporation, Brigham City, UT; 453-734-9433, www.vulcraft.com; or accepted equal.

1.2 MATERIALS

- A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.
- B. Steel Bearing Plates and Other Shapes: ASTM A36/A36M.
- C. Carbon-Steel Bolts and Threaded Fasteners: ASTM A307, Grade A, carbon-steel, hex-head bolts and threaded fasteners, carbon steel nuts, and flat, unhardened steel washers.
1. Finish: Plain, uncoated. Hot-dip zinc coating, ASTM A153/A153M, Class C.
- D. High-Strength Bolts, Nuts, and Washers: ASTM A325, Type 1, heavy hex steel structural bolts, with ASTM A563, Grade C, heavy hex carbon-steel nuts; and ASTM A563 heavy hex carbon-steel nuts; and ASTM F436 hardened carbon-steel washers.
1. Finish: Plain, uncoated. Hot-dip zinc coating, ASTM A153/A153M, Class C.
- E. Welding Materials: AWS D1.1; type required for materials being welded. Filler metal shall be classified as low hydrogen and shall have a minimum Charpy V-notch toughness of twenty foot-pounds at minus 20 degrees F, as determined by AWS Classification or manufacturer certification.
- F. Steel Shop and Touch-Up Primer: TNEMEC Series 115 Uni-Bond DF or accepted equal.
1. Primer for steel members indicated to receive cementitious or intumescent fireproofing, shall be compatible with cementitious and intumescent fireproofing materials.
- G. Galvanized Steel Shop and Touch-Up Primer: ZRC Galvilite Galvanizing Repair Compound as manufactured by ZRC Worldwide Company, Phone: (800) 831-3275, or accepted equal.
1. Primer for galvanized steel members indicated to receive intumescent fireproofing, shall be compatible with intumescent fireproofing materials.

1.3 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
- B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C. Provide holes in chord members for connecting and securing other construction to joists.

- D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."
- E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- F. Camber: Camber joists in accordance with SJI's "Specifications."
- G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

1.4 LONG-SPAN STEEL JOISTS

- A. Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements, as follows:
 - 1. Joist Type: LH-series steel joists and DLH-series steel joists.
 - 2. End Arrangement: Underslung and/or Square as required.
 - 3. Top-Chord Arrangement: Parallel, or Pitched 1/8 inch per 12 inches (1:96), one way, or Pitched 1/8 inch per 12 inches (1:96), two ways.
- B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C. Provide holes in chord members for connecting and securing other construction to joists.
- D. Camber: Camber joists in accordance with SJI's "Specifications."
- E. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

1.5 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Hot-dip zinc coat according to ASTM A123/A123M bearing plates.
- C. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.
- D. Where required, supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface, unless otherwise indicated.

1.6 SHOP PRIMING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

- C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry film thickness of not less than one mil.

END OF SECTION

SECTION 05 31 00

STEEL DECKING

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Acceptable Manufacturer, Standard Decking Profiles:
 - 1. Basis-of-Design: ASC Steel Deck, West Sacramento, CA; 916-372-6851, www.ascsd.com; per evaluation agency reports as follows:
 - a. IAPMO Evaluation Report No. ER-0161 for bare steel deck.
 - b. IAPMO Evaluation Report No. ER-0329 for concrete-filled steel deck.
- B. Acceptable Manufacturer, Specialty Decking Profiles:
 - 1. Basis-of-Design: Epic Metals Corporation, Rankin, PA; 877-696-3742, www.epicmetals.com. ICC Evaluation Report No. ESR-2047; Products:
 - a. Epicore.
 - b. Epicore ER2R.
 - c. Epicore ER2RA.
 - d. Epicore ER3.5.
 - e. Epicore ER3.5A.
 - f. Wedge Anchor Fastening System: UES Evaluation Report No. 226.
- C. Substitutions: Provide valid Evaluation Agency Report.
 - 1. Substitution requests for steel decking shall consider the vertical and lateral load capacities of final system, including attachments. Provide a comparison summary of proposed and specified deck systems showing that the proposed system has equal or greater vertical and lateral load capacities for all conditions shown on Drawings. Systems with lower load capacities will not be acceptable.
 - 2. Substitution requests will require review by the Structural Engineer of Record and Authority Having Jurisdiction (AHJ) Cost for such reviews shall be borne by Contractor.
 - 3. Do not submit shop drawings with substituted decking manufacturer until decking manufacturer has been accepted via substitution request process.

1.2 MATERIALS

- A. Sheet Steel for Bare Deck: ASTM A653/A653M, SS designation, Grade 40 (minimum yield 38 KSI); zinc coated conforming to ASTM A653/A653M, G60, unless noted otherwise. Refer to Drawings for types and sizes of steel decking.
- B. Sheet Steel for Composite Deck: ASTM A653/A653M, SS designation, Grade 50 (minimum yield 50 KSI) and Grade 40 for 3 inch Type "W" and "WF" deck profiles (minimum yield 40 KSI); zinc coated conforming to ASTM A653/A653M, G60, unless noted otherwise. Refer to Drawings for types and sizes of steel decking.

- C. Sheet Steel for Epic Metals Products: ASTM A653/A653M, SS designation, Grade 40 (minimum yield 40 KSI); zinc coated conforming to ASTM A653/A653M, G60. Refer to Drawings for types and sizes of steel decking.
- D. Welding Materials: Conform to AWS D1.1 and D1.3, with a minimum 60 KSI filler metal yield strength.
- E. Shop and Touch-Up Zinc Rich Primer for Galvanized Surfaces: ZRC Galvilitite Galvanizing Repair Compound as manufactured by ZRC Worldwide Company, Marshfield, MA; 800-831-3275, www.zrcworldwide.com, or accepted equal.
- F. Steel Decking and Design: Steel decking shall be metallic coated with interlocking side lap. Deck types and minimum structural properties shall be as indicated on Drawings. Submit Evaluation Agency Reports that demonstrate compliance with design requirements.
 - 1. Decking shall be vented with factory punched holes where filled with concrete; otherwise provide non-vented decking. Venting is not required at concrete filled deck where underside is permanently exposed or where cellular deck is used.
- G. Epicore, Epicore ER2R, Epicore ER2RA, Epicore ER3.5, and Epicore ER3.5A roof decks shall provide an exposed bottom surface that is substantially flat. The narrow rib openings of the deck units shall provide the appearance of a linear ceiling.
 - 1. Accessories:
 - a. Fasteners for sidelaps and overlying roofing materials shall be concealed within the depth of the dovetail-shaped ribs.
 - b. Epic "Wedge Nut" or similar hanging devices shall be installable and relocatable along the length of the interior ribs of the deck units. Minimum spacing, load capacities and proper installation procedure of the hanging devices shall be per UES Evaluation Report No. 226.
 - c. Sump pans, ridge plates, valley plates, transition plates, and eave plates shall be provided per manufacturer's standards.
 - d. 2 inch thick by 4-1/2 inch wide sound absorbing elements of three pound density fiberglass shall be provided for installation above the perforated holes in the bottom flat area between the dovetail-shaped ribs. To facilitate field painting of the perforated surfaces, the sound absorbing elements shall be supported on corrosion resistant mesh spacers.
- H. Welded Headed Studs: ASTM A108. Welding testing and inspection shall be in accordance with AWS D1.1 and CBC Sections 1705.2.2, 1705.12 and 1705.13.
- I. Insulation at Acoustical Decking: Unfaced fiberglass batts provided and installed by decking manufacturer, cut to size for profile of decking.

1.3 FABRICATION

- A. Fabrication: All steel decking units shall be roll-formed to assure uniformity and strength.
- B. Allowable Tolerances: Maximum variation in unit alignment 1/4 inch in 40 feet (1/1920).

- C. Workmanship: All work shall be neat, trim, true to line and upon completion shall present a true finished surface of specified deck profile, free of dents, deformations, creases, weld spatter or other noticeable defects. Steel deck permanently exposed to view shall be manufactured, handled, and transported for “exposed” installation.
 - 1. Acoustical Decking: Remove all weld markings following sheet resistant spot welding and touch up all welds with same primer used to prime decking materials. Touch up shall not be obvious.
- D. Reinforcement: Provide reinforcement for openings, cutouts and free edges of decking as required for strength and stiffness. Provide reinforcement where a cell is cut parallel to rib as necessary to make a tight fit along the cut cell. Such reinforcement shall be in addition to structural supports shown on Drawings and specified in Section 05 12 00.
- E. Miscellaneous Work: Provide all other transition pieces, reinforcement and miscellaneous decking items as detailed and required to provide a complete installation.
- F. Where steel decking is scheduled to receive fireproofing or a paint finish, it shall be provided free of lubricants, oils, passivators, and other substances which would impair the adhesion of the fireproofing or paint system.

END OF SECTION

SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 1 PRODUCTS

1.1 METAL FRAMING SYSTEM

A. Acceptable Manufacturers:

1. ClarkDietrich Building Systems, West Chester, OH; 513-870-1100, www.clarkdietrich.com.
2. MarinoWARE, South Plainfield, NJ; 800-627-4661, www.marinoware.com.
3. CEMCO, Pittsburg, CA; 925-473-9340, www.cemcosteel.com.
4. SCAFCO Steel Stud Company, Spokane, WA; 509-343-9000, www.scafco.com.

1.2 FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, grade as follows:
1. Grade: ST33H for 18 gauge and lighter, ST50H for 16 gauge and heavier.
- B. Sheet Steel for Vertical Deflection and Drift Clips: ASTM A1003/A1003M and ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 50 (340).
 2. Coating: G90 (Z275).
- C. Studs, Zees, Angles and Plates: ASTM A1003/A1003M Steel sheet formed to channel shape, solid web; sizes and gauges, as indicated on Drawings.
- D. Deflection Track Slotted: Single, deep-leg, U-shaped steel track: punched with vertical slots in both legs. Steel Sheet top runner manufactured to prevent cracking of finishes applied to framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- E. Vertical Deflection Clips: Manufacturer's standard bypass and head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web and capable of resisting forces imposed by the wall system.
- F. Joists: ASTM A1003/ A1003M Grade 50, Class 1 or 2 sheet steel, formed to channel shape, punched web.
- G. Headers and Jambs: Shapes used to form header beams and jambs, columns or posts, of web depths indicated, un-punched, with stiffened flanges.
- H. Channel Bridging or Bracing: U-Channel Assembly: ASTM C645; Base metal thickness of 0.0538 inch, and minimum 1/2 inch wide flanges.
- I. Framing members shall be provided by a member of the Steel Stud Manufacturer's Association (SSMA) or Steel Framing Industry Association (SFIA).

1.3 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered.
- B. Plates, Gussets, Clips: Formed sheet steel, thickness as shown on Drawings.
- C. Shop and Touch-Up Primer: TNEMEC Series 115 Uni-Bond DF or accepted equal, unless otherwise required to match shop primer.
- D. Shop and Touch-Up Zinc Rich Primer for Galvanized Surfaces: ZRC Galvilite Galvanizing Repair Compound as manufactured by ZRC Worldwide Company, Marshfield, MA; 800-831-3275, www.zrcworldwide.com, or accepted equal.

1.4 FASTENERS

- A. Self-drilling, Self-tapping Screws, Bolts, Nuts and Washers: ASTM C1513, corrosion resistant.
- B. Welding: In conformance with AWS D1.1 and AWS D1.3.
- C. Power Actuated Fasteners: Tempered steel pins with special corrosive-resistant plating or coating. Pins shall have guide washers to accurately control penetration, minimum 1-1/8 inch. Fastening shall be accomplished by low-velocity pistol-driven powder activated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems; Impex Tool Corporation; ITW Ramset/Redhead; or accepted equal. All fasteners shall have Evaluation Agency approval.

1.5 FINISHES

- A. Studs and Joists: Provide galvanized finish as follows:
 - 1. Coating Class: G-60 per ASTM A653.
- B. Tracks and Headers: Provide galvanized finish as follows:
 - 1. Coating Class: G-60 per ASTM A653.
- C. Bracing, Furring, Bridging: ASTM A1003/A1003M, hot dip galvanized to Coating Class G-60 per ASTM A653.
- D. Plates, Gussets, Clips: ASTM A1003/A1003M, hot dip galvanized to Coating Class G-60 per ASTM A653.
- E. No equivalent coatings allowed.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 PRODUCTS

1.1 MATERIALS

- A. Steel: Unless otherwise noted, provide steel materials as follows:
1. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
 2. Plates: ASTM A283/A283M.
 3. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 (Z275) coating designation, structural quality.
 4. Pipe: ASTM A53/A53M, Type E or S, Grade B.
 5. HSS:
 - a. Tubing: ASTM A500, Grade B.
 - b. Round: ASTM A500, Grade B.
 6. Mechanical Tubing: ASTM A513, MT1010, Type 5, drawn over mandrel (DOM).
 7. Bolts, Nuts and Washers: ASTM A307.
- B. Stainless Steel: Unless otherwise noted, provide stainless steel materials as follows:
1. Bars and Shapes: ASTM A276, Type 304.
 2. Tubing: ASTM A554, Grade MT, Type 304.
 3. Pipe: ASTM A312/A312M, Grade TP, Type 304.
 4. Plates, Sheets, and Strip: ASTM A240/A240M, hot rolled and pickled (HRAP), Type 304.
 5. Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 304.
 6. Bolts, Nuts, and Washers: Regular hexagon-head annealed stainless-steel bolts, nuts and, where indicated, flat washers. ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.
- C. Aluminum:
1. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6, unless otherwise indicated.
 2. Aluminum Extrusions: ASTM B221, Alloy 6063-T6, unless otherwise indicated.
 3. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
 4. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.
- D. Anchorage:
1. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.
 2. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, 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 E488, conducted by a qualified independent testing agency.

E. Welding Materials:

1. Steel: AWS D1.1; type as required for materials being welded.
2. Sheet Steel: AWS D1.3; type as required for materials being welded.
3. Stainless Steel: AWS D1.6; type as required for materials being welded.
4. Aluminum: AWS D1.2; type as required for materials being welded.

F. Weld filler material: All weld filler material shall have a minimum tensile strength of 70 ksi per AWS D1.1, latest edition approved by code enforcement agency.

G. Steel Shop and Touch-Up Primer: TNEMEC Series 115 Uni-Bond DF or accepted equal.

H. Shop and Touch-Up Zinc Rich Primer for Galvanized Surfaces: ZRC Galviline Galvanizing Repair Compound as manufactured by ZRC Worldwide Company, Phone: (800) 831-3275, or accepted equal.

I. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

1.2 SERVICE YARD GATE

A. Components:

1. Steel Plates and Sections: Sizes and thicknesses as shown on Drawings.
2. Metal Panel: 1-1/2 inch by 18 gauge steel deck, galvanized.
3. Tension Rods and Turnbuckles: 1/2 inch diameter.

B. Hardware: Refer to Section 08 71 00.

C. Paint finish under provisions of Section 09 91 00.

1.3 METAL CANOPY

A. Components:

1. Steel Plates and Sections: Sizes and thicknesses as shown on Drawings.
2. Galvanized Metal Deck: Refer to Section 05 31 00.

1.4 RAILING ASSEMBLIES

A. Steel Railing Assemblies: Fabricated from steel pipe or mechanical tubing, steel plates and sections; sizes as shown on Drawings. At exterior locations, hot-dip galvanize all components in accordance with ASTM A123/A123M, minimum 1.25 ounces per square foot.

1. Steel Pipe: ASTM A53/A53M, Grade A, Schedule 40.
2. Steel Mechanical Tubing: ASTM A513, minimum wall thickness 0.156 inch.
3. Handrail Wall Brackets: Steel.
4. Galvanize exterior handrail and guardrail assemblies after fabrication. After assembly has been galvanized, fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
5. Finish: Field painted in accordance with Section 09 91 00; color as selected by Architect.

- B. Stainless Steel Railing Assemblies: Fabricated from stainless steel tubing, stainless steel plates and sections; size as shown on Drawings.
 - 1. Stainless Steel Tubing: ASTM A554, Grade MT, Type 304, minimum wall thickness 0.156 inch.
 - 2. Stainless Steel Pipe: ASTM A312, Grade TP, Type 304.
 - 3. Finish: 320 grit polished and buffed.
- C. Steel Tube or Pipe Barrier at Drinking Fountain: Steel mechanical tubing; size as shown on Drawings. At exterior locations, Hot-dip galvanized in accordance with ASTM A123/A123M, minimum 1.25 ounces per square foot.
 - 1. Steel Pipe: ASTM A53, Grade B, Schedule 40.
 - 2. Galvanize steel tube or pipe barrier assembly after fabrication.
 - 3. Finish: Field painted in accordance with Section 09 91 00; color as selected by Architect.
- D. Stainless Steel Tube Barrier at Drinking Fountain: Fabricated from stainless steel tubing or pipe, stainless steel plates and sections; size as shown on Drawings.
 - 1. Stainless Steel Tubing: ASTM A554, Grade MT, Type 304, minimum wall thickness 0.156 inch.
 - 2. Stainless Steel Pipe: ASTM A312, Grade TP, Type 304.
 - 3. Finish: 320 grit polished and buffed.
- E. Fabrication:
 - 1. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.
 - 2. Handrails shall not rotate in their fittings.

1.5 BOLLARDS, METAL

- A. Pipe Bollard: ASTM A53/A53M; Schedule 40, Weight Class STD, steel pipe, galvanized.
 - 1. Designator and Dimensions:
 - a. NPS Designator: 3-1/2, 4, or 6 inches NPS.
 - b. Outside Diameter: 4, 4.5, or 6.625 inches.
 - c. Wall Thickness: 0.226 inch For 3-1/2-inch NPS, 0.237 inch For 4-inch NPS, or 0.280 inch For 6-inch NPS.
 - d. Height and Embedment: As indicated on Drawings.
 - 2. Fill fixed bollard with concrete. See Section 03 30 00 for concrete requirements.
 - a. Cap bollard with concrete dome.
 - 3. Cap bollards with 1/4-inch thick steel plate, welded to pipe.
- B. Bollard Anchorage at Existing Slab: Fabricate bollards with 3/8-inch-thick steel base plates for bolting to concrete slab. Drill base plates at all four corners for 3/4-inch diameter anchor bolts.
- C. Door Operator Mounting: Where bollards are indicated to receive controls for door operators, provide necessary cutouts for controls and holes for wire.

- D. Removable Bollards: Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch wall-thickness steel tubing with an outside diameter approximately 1/16 inch less than inside diameter of bollards. Match drill sleeve and bollard for 3/4 inch diameter steel machine bolt.
- E. Sleeves: Fabricate sleeves for bollard anchorage from steel pipe with 1/4-inch-thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than outside diameter of bollard.
- F. Finish: Field paint in accordance with Section 09 91 00; color and pattern as selected by Architect.

1.6 DOWNSPOUTS

- A. Downspouts and Support Brackets:
 - 1. Pipe: ASTM A53/A53M, Schedule 40, round, galvanized, size as indicated on Drawings.
 - 2. Support Brackets: Steel plates, sections, and sheets: galvanized; size and thickness as shown on Drawings.
 - 3. Finish: Site paint finish under provisions of Section 09 91 00.

1.7 ELEVATOR PIT LADDER

- A. Regulatory Requirements: Conform to ANSI A14.3, OSHA, and UL requirements, as applicable.
 - 1. For elevator pit ladders, comply with ASME A17.1.
- B. Elevator Pit Ladder, General:
 - 1. Space side rails 18 inches apart, unless otherwise indicated.
 - 2. Support each ladder at top and bottom, and not more than 48 inches on center, with brackets made from same metal as ladder.
 - 3. Provide brackets and anchorage as indicated on Drawings.
- C. Steel Ladders:
 - 1. Side Rails: Continuous, 3/8 inch by 3-1/2 inch steel flat bars, with eased edges, unless otherwise indicated.
 - 2. Rungs: 3/4-inch-diameter steel bars.
 - 3. Fit rungs in centerline of side rails; plug-weld and grind smooth on outer rail faces.
 - 4. Provide non-slip surfaces on top of each rung by coating with abrasive material metallically bonded to rung by a proprietary process. Provide one of the following products:
 - a. W. S. Molnar Company; SlipNOT.
 - b. IKG Industries, a Harsco company; Mebac.
- D. Finish: Galvanized in accordance with ASTM A123/A123M, minimum 1.25 ounces per square foot coating.

1.8 BICYCLE RACKS

- A. Basis-of-Design Product: "Rolling Rack" by Dero Bike Rack Company, Minneapolis, MN; 800-891-9298, www.dero.com.
- B. Acceptable Manufacturers: Provide the product named above or accepted equal by one of the following:
1. American Bicycle Security Company, Ventura, CA; 800-245-3723, www.ameribike.com.
 2. BRP Enterprises, Inc., Lincoln, NE; 888-438-5311, www.brponline.com.
 3. Canterbury International, Los Angeles, CA; 800-935-7111, www.canterburyintl.com.
 4. Creative Pipe, Inc., Rancho Mirage, CA; 800-644-8467, www.creativepipe.com.
- C. Bicycle Rack Construction:
1. Frame: Steel pipe, ASTM A53, Schedule 40, not less than 2 inches NPS (2.375 inches outside diameter).
 2. Style: Serpentine style, suitable for double-sided parking.
 3. Overall Height: 36 inches above floor level.
 4. Capacity: Designed to accommodate nine bicycles, minimum.
 5. Finish: Galvanized.
 6. Post Installation: Cast in concrete. Fill annular space with non-shrink epoxy grout.

1.9 STAIR SAFETY NOSINGS

- A. Safety Nosing: Provide aluminum safety nosing with anti-slip abrasive finish.
1. Basis-of-Design Product: Supergrit® Safety Nosing, Type 231-BF with Sure-hold anchors by Wooster Products Inc., Wooster, OH; 800-321-4936, www.wooster-products.com; or accepted equal.
 2. Nosing Materials:
 - a. Type 6063-T5 extruded aluminum, with anti-slip abrasive filler containing approximately 65 percent virgin grain aluminum oxide (Al₂O₃) and silicon carbide abrasive.
 - b. Width: 3 inches.
 - c. Thickness: 1/4 inch.
 - d. Length: Provide nosing for full width of treads less 1/8 inch on either side for clearance.
 - e. The radius of curvature at the leading edge of the nosing shall be no greater than 1/2 inch.
 3. Anchorage: Provide integral anchorage in nosing, as standard with manufacturer and acceptable to Architect.
 4. Abrasive Filler Color: As selected by Architect from manufacturer's full range of standard colors.

1.10 VERTICAL VEGETATION SCREEN AND GATES

A. Manufacturer:

1. Greenscreen®, Los Angeles, CA; 800-450-3494, www.greenscreen.com. Product: "Greenscreen®" panels.

B. Vegetation Screen, Vertical: Provide framing members and screen panels as indicated on Drawings.

1. Provide fittings and fasteners as required and as shown on Drawings for free standing and wall-mounted applications.

C. Materials:

1. Welded Wire Fabric: 14 gauge, ASTM A641 galvanized wire.
2. Trim: 20 gauge galvanized steel, ASTM A879.
3. Clips and Straps: Provide manufacturer's standard types of clips and straps suitable for mounting conditions. Fabricate from ASTM A879 galvanized steel. Adjustable clips shall have 1/4 inch diameter 18-8 stainless steel bolt, washer, and nut.
4. Fasteners for attachment to posts: 18-8 stainless steel nuts, bolts, and washers; self-tapping, self-drilling, stainless steel fasteners for mounting clips to posts.
5. Fasteners for Attachment to Structure:
 - a. To Concrete: 550 pounds.
 - b. To Structural Steel: 550 pounds.
 - c. To Light-Gauge Steel Framing: 550 pounds.

D. Panel Size: Modular, 4 feet by 8 feet, 3 inches thick, with 2 inch by 2-inch face grids, unless otherwise indicated on Drawings.

1. Finish: Polyester powder coat; Color: Black.

E. Fittings and Accessories: As standard with manufacturer.

F. Framing: Member sizes and configuration as indicated on Drawings; paint finished to match screen panels.

G. Concrete: 3,000 psi minimum compressive strength; refer to Section 03 30 00.

H. Gates: Lattice Design Gates by Ametco Manufacturing Corporation or accepted equal with the following characteristics:

1. 2 inch square steel frame.
2. Steel lattice infill panels with 2-7/16 inch by 2-19/32 inch mesh.
 - a. Vertical Bar Size: 1 inch by 1/8 inch.
 - b. Horizontal Rod Size: 3/16 inch diameter.
3. One slide bolt with provision for padlock on each gate leaf.
4. Manufacturer's heavy duty steel hinges, 3 per gate leaf.
5. Finish: Hot-dip galvanized with polyester powder coat painted black to match adjacent vegetation screen color.

1.11 MISCELLANEOUS METAL FABRICATIONS

- A. Provide miscellaneous metal fabrications as required to complete work under other Sections, but not specified in those Sections.
- B. Miscellaneous metal work, including, but not limited to, the following items:
 - 1. Steel Framing and Supports For:
 - a. Countertops.
 - b. Overhead doors.
 - c. Mechanical and electrical equipment.
 - 2. Support angles for elevator door sills.
 - 3. Elevator hoistway and lifeline beams.
 - 4. Loose bearing and leveling plates.
 - 5. Steel weld plates and angles for casting into concrete not specified in other Sections.

1.12 SHOP FABRICATION

- A. Fit and shop assemble in largest practical sections, for delivery to site.
 - 1. 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. Fabricate panels and gates as shown on Drawings and approved shop drawings.
- C. Fabricate items with joints tightly fitted and secured.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Cut, drill, and punch metals cleanly and accurately. De-burr rough edges and holes.
- F. Form exposed work true to line and level with accurate angles and surfaces and straight edges.
- G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- H. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication except where specifically noted otherwise.
- I. Miter and weld members, welds ground smooth.
- J. 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.

1.13 FINISHES

- A. Prepare structural component surfaces in accordance with SSPC SP-2 at concealed locations and SSPC SP-6 at exposed locations. Provide Class A (clean mill scale) contact surfaces per RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts, LRFD or ASD at high-strength bolted connections.
- B. Do not prime surfaces in direct contact with concrete, where field welding is required, or contact surfaces of steel-to-steel connections.
- C. Shop prime all exposed interior steel with shop primer unless otherwise noted. Apply primer in one coat, to meet or exceed the minimum mil thickness required by the primer manufacturer.
- D. All unexposed, concealed, or enclosed interior or exterior steel requires no finish.
- E. All exposed exterior steel shall be galvanized after fabrication unless otherwise noted.
 - 1. Galvanizing shall be in accordance with ASTM A123/A123M, on designated steel items. Provide minimum 1.25 ounces per square foot galvanized coating.
 - 2. At galvanized members, touch-up all welds with zinc-rich primer.
- F. Aluminum Finishes: As specified in this Section. Do not paint aluminum surfaces, unless required for protection of dissimilar materials.
- G. Stainless Steel Finishes: As specified in this Section. Do not paint stainless steel surfaces.
- H. Painting shall conform to applicable requirements of Section 09 91 00.

END OF SECTION

SECTION 05 51 00

METAL STAIRS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. American Stair Corporation.
- B. Worthington Metal Fabricators.
- C. Pacific Stair Corporation.

1.2 MATERIALS

- A. Metal Surfaces: For fabrication of steel stair work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove blemishes by grinding and/or welding and grinding prior to cleaning, treating and application of surface finish.
 - 1. All interior steel components shall receive one coat of shop primer.
- B. Structural Steel Plates, Shapes and Bars: ASTM A36/A36M.
- C. Hot-Rolled Carbon Steel Sheets and Strips: ASTM A1011/A1011M.
- D. Sheet Steel: ASTM A1011/A1011M, Grade B Structural Quality.
- E. Steel Pipe: ASTM A53/A53M, Type S, Grade A and ASTM A500 Grade B.
- F. Hollow Structural Sections: ASTM A500 Grade B.
- G. Welding Materials: AWS D1.1, type required for materials being welded.
- H. Bolts, Nuts and Washers: Manufacturer's standard.
- I. Steel Shop and Touch-Up Primer: TNEMEC Series 115 Uni-Bond DF or accepted equal.
- J. Shop and Touch-Up Zinc Rich Primer for Galvanized Surfaces: ZRC Galvilite Galvanizing Repair Compound as manufactured by ZRC Worldwide Company, Phone: (800) 831-3275, or accepted equal.
- K. Handrail brackets at walls shall be steel, as indicated on Drawings.

1.3 FABRICATION

- A. Size members as required for job conditions. Fit and shop assemble in largest practical sections, for delivery to site.
- B. Stringers and Headers: Minimum 7 gauge steel plate.
- C. Treads: Provide 14 gauge minimum structural steel form to receive concrete fill as specified in Section 03 30 00. Provide support/retainer with steel angles side-supported brackets shop welded to stringers.

- D. Metal Risers: Form metal risers of 14 gauge minimum structural sheet steel. Shape to configuration shown and shop weld to stringer.
- E. Landings: Construct platforms of loose structural steel channel side-supported headers and miscellaneous framing members independent of stair stringers as shown. Provide minimum 14 gauge steel sub-deck complete with shop welded #5 reinforcing rods at 14 inches on center each way. Concrete fill as specified in Section 03 30 00.
- F. Form stringers with rolled steel channels, 12 inches deep minimum; prime paint finish.
- G. Fabricate stairs and landings with closed risers.
- H. Secure tread pans to stringers with clip angles; welded in place.
- I. Form stringers with rolled steel channels, 12 inches deep; prime paint finish.
- J. Reinforce underside of landing with angles to attain design load requirements as specified in this Section.
- K. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- L. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- M. Accurately form components required for anchorage of stairs and landings and railings to each other and to building structure.
- N. All stair fasteners shall be provided and installed by stair manufacturer or fabricator.
- O. Form work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to radius of approximately 1/32 inch. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- P. Weld corners and seams in accordance with recommendations of AWS. Grind these exposed welds to match and blend with adjoining surfaces.
- Q. Join rails and corners by mitered and welded joints made by fitting top rail and intermediate rails in a unit and bracketed, or weld to posts as indicated. Butt railing splices and reinforce by a tight fitting interior sleeve. Plumb posts in each direction. Secure posts by welding direct to stair stringers.
- R. Remove scale, rust and other deleterious materials before applying shop primer. Apply one shop coat of metal primer to all fabricated metal items.
- S. Clean surfaces of rust, scale, grease and foreign matter prior to finishing.
- T. Do not prime surfaces in direct contact with concrete or where field welding is required.
- U. Prime paint items with one coat of metal primer.
- V. Clean and strip primed steel items to bare metal where site welding is required.
- W. Fit and shop-assemble in largest practical sections, for delivery to site.

- X. Fabricate components with joints tightly fitted and secured.
- Y. Continuously seal jointed pieces by continuous welds.
- Z. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush and hairline. Ease exposed edges to small uniform radius.

1.4 RAILING ASSEMBLIES

- A. Refer to Section 05 50 00.
- B. Wall Railings: Install with specified brackets spaced and anchored as indicated. Return handrails to wall. Provide welded steel end caps at returns.
- C. Fabrication:
 - 1. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.
 - 2. Handrails shall not rotate in their fittings.

END OF SECTION

SECTION 05 58 13

COLUMN COVERS

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers and Products

1. Fry Reglet Corporation, Alpharetta, GA; 800-955-2343, www.fryreglet.com. Product: Series KS with soft V butt joint, mechanical.
2. SAF Metal Fabrications, Villa Rica, GA; 770-942-1207, www.saf.com.
3. MM Systems Corporation, Pendergrass, GA 30567; phone: 800.241.3460; fax: 706.824.7500; URL: <http://www.mmsystemscorp.com>.

1.2 COLUMN COVERS

A. Material:

1. Aluminum Sheet: ASTM B209, 3003-H14 alloy, minimum [0.125] [0.90] inch wall thickness.
2. Aluminum Extrusions: ASTM B221, 6063-T6 alloy, or
3. Stainless Steel Sheet: ASTM A666, Type 304, minimum 16 gauge (0.064 inch), or
4. Bronze Sheet: ASTM B36/B36M, Muntz metal alloy 280, minimum 14 gauge (0.064 inch), or
5. Galvanized Steel Sheet: ASTM A1008/A1008M, minimum gauge 16 (0.063 inch) electroplated.

B. Anchors, Clips, and Fasteners: Manufacturer provided as a complete package. No exposed fasteners for metal closures shall be allowed.

1.3 FABRICATION

A. Fabricate in accordance with accepted shop drawings.

B. Column Cover Joints:

1. Horizontal Joint: Up to 12 feet - 6 inches without horizontal joints.
2. Vertical Joint: Closed or Reveal vertical joint as shown on Drawings.

C. Reveals:

1. Top Reveal: 4 inch.
2. Horizontal Accent Reveal: 4 inch.
3. Base Reveal: 4 inch.

D. Fabricate column covers true to geometry as shown on plan view of Drawings with a tolerance of +/- 1/16 inch.

E. N-gauge Column Covers:

1. Fabricate with return flanges at the vertical joints for structural strength. Reinforce top and bottom with internal stiffener ring.

2. No support posts are required for N-gauge system; however, tiebacks shall be required for columns with stacking joints. Tiebacks shall be engineered and provided by column cover manufacturer.
3. Provide engagement clips and factory-attach to the column covers at intervals to allow for complete accessibility without tools or exposed fasteners. A 3/4 inch reveal is required at the top for installation.
4. Provide a locking clip at the top of column cover.

1.4 FINISHES

- A. Aluminum or Galvanized Steel Sheet: Two-coat, shop-applied, baked-on fluoropolymer coating system based on Atochem North America, Inc. Kynar 500 resin or Ausimont U.S.A., Inc. Hylar 5000 resin (polyvinylidene fluoride, PVDF), formulated by a licensed manufacturer and applied by manufacturer's approved applicator to meet AAMA Publication 605.2.
 1. Coating system shall provide minimum 1.0 mil dry film thickness consisting of minimum 0.20 mil primer and minimum 0.80 mil color coat.
 2. Color as selected by Architect from manufacturer's full range of standard colors..
- B. Stainless Steel: Factory applied No. 4 brushed finish.
- C. Bronze: Factory applied No. 4 brushed finish, followed by an air dry clear lacquer finish.

END OF SECTION

SECTION 05 73 00
DECORATIVE METAL RAILINGS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Julius Blum & Co., Inc., Carlstadt, NJ; 800-526-6293, www.juliusblum.com. Product: Connectorail System.
- B. HDI Railing Systems, Columbia, PA; 717-285-4088, www.hdirailings.com.
- C. Livers Bronze.
- D. P&P Artec.

1.2 ALUMINUM RAILING SYSTEM

- A. Rails: 1-1/2 inch diameter, Schedule 40, extruded tubing. Permanently anchored. Fabricate from anodized aluminum, 6063-T52 tube.
- B. Fittings: Wrought material of aluminum. Fittings fabricated from more than one piece shall be of welded construction with no weld marks visible when the fitting is installed.
- C. Connector Sleeves: Internal connector sleeves shall be of extruded aluminum.
- D. Splice Joints: Secured by internal connector sleeves with the use of epoxy adhesive as recommended by manufacturer.
- E. Exposed Fasteners: 3/8 inch stainless steel machine screws.
- F. Handrail Brackets: Aluminum.
- G. Finish: Mill finish aluminum.

1.3 FABRICATION

- A. Fit and shop-assemble components in largest practical sizes for delivery to site.
- B. Fabricate components with joints tightly fitted and secured. Remove burrs from all exposed edges, with no chamfer.
- C. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- E. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- F. Close exposed ends of pipe by use of appropriate end caps.

- G. Accurately form components to suit stairs, landings and curves to each other and building structure.
- H. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.
- I. Handrails shall not rotate in their fittings.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 PRODUCTS

1.1 MATERIALS

A. Wood:

1. Lumber shall be identified by the grade mark of an approved lumber grading or inspection agency in conformance with NIST Doc PS-20.
2. Lumber species and grades shall be as follows:
 - a. 2x and 3x framing: DF-L, No. 2
 - b. 4x framing: DF-L, No. 1
 - c. 6x and larger framing: DF-L, Select Structural.

B. Plywood:

1. General Use: DOC PS 1, Exposure 1. Thickness and type shall be as indicated on Drawings.
2. Plywood back boards for electrical, telephone, and similar types of wall mounted equipment shall be provided as indicated and as required by design conditions. Unless otherwise specified, plywood shall be 3/4 inch thick, fire-retardant treated, exterior A-C plywood with "A" face exposed.

C. Plates, Blocking, Cast-in-Nailers at Concrete Curbs, or Sills on Concrete: Douglas Fir No. 1 pressure-treated.

D. Preservative Treatment:

1. Furnish pressure treated wood in accordance with AWWA Standard U1.
2. All preservative treatment products shall be waterborne, alkali-based type, acceptable for use in California.
 - a. Acceptable products and retention rates for Douglas Fir sawn lumber:
 - 1) Alkaline Copper Quat (ACQ) with retention rates of 0.25 pounds per cubic foot for wood installed above grade and 0.40 pounds per cubic foot for wood in contact with the ground.
 - 2) Ammoniacal Copper Zinc Arsenate (ACZA) with retention rates of 0.25 pounds per cubic foot for wood installed above grade and 0.40 pounds per cubic foot for wood in contact with the ground.
 - 3) Copper Azole Type C (CA-C) with retention rates of 0.06 pounds per cubic foot for wood installed above grade and 0.15 pounds per cubic foot for wood in contact with the ground.
3. Cut, bored or notched surfaces shall be retreated per AWWA Standard M4 by brushing on a minimum of three coats of Copper Naphthenate (CuN-W) containing a minimum of 1.0 percent copper metal.
4. Each piece of preservative treated lumber shall be labeled per CBC Section 2303.1.9.1 shall bear AWWA quality stamp by an ALSC approved treating inspection agency indicating compliance with the AWWA standards.

5. Type of fasteners used with pressure treated wood shall be in accordance with CBC Section 2304.10.5.1.
- E. Rough Hardware Fastenings and Connections: All types including bolts, lag screws, nails, spikes, screws, washers, framing devices and other rough hardware, or kinds that may be purchased and that require no further fabrication, shall be furnished and installed for all finish and rough carpentry. All exterior hardware shall be hot-dipped galvanized per ASTM A123/123M Standards.
 1. Nails: Common wire nails or spikes; box nails and "sinkers" are not permitted.
 2. Bolts: ASTM A307, Grade A, hexagonal heads, unless noted otherwise. Upset threads are not permitted.
 3. Washers: Washers for bearing against wood shall be provided under all bolt heads and nuts. Washers shall be as indicated on Drawings.
 4. Power Actuated Fasteners: Tempered steel pins with special corrosive-resistant plating or coating. Pins shall have guide washers to accurately control penetration, minimum 1-1/8 inch. Fastening shall be accomplished by low-velocity pistol-driven powder activated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems; ITW Ramset/Redhead; Impex Tool Corporation; or accepted equal. All fasteners shall have ICC approval.
 5. Post-Installed Anchors: ICC approved, Hilti, ITW Ramset/Redhead Fastening Systems, or accepted equal.
 6. Fabricated Sheet Metal Timber Framing Connectors: ICC approved; fabricate from hot-dipped galvanized steel. Connector material shall be 18 gauge minimum (1/8 inch plate materials where welded, unless otherwise noted), and punched for nailing. Nails and nailing shall conform to manufacturer's printed instructions with a nail provided for each punched hole. Connector types shall be as indicated on Drawings. Provide timber framing connectors by Simpson Co. or accepted equal. Framing connectors shall be stamped with manufacturer's logo, and model designation.
 - a. Inspection of Timber Connectors shall conform to CBC Section 1705A.5.6.
 7. Nailing Schedule: Except as otherwise indicated on Drawings or specified, nailing shall conform to 2016 CBC, Table 2304.10.1, Fastening Schedule.
 8. Lag Screws: Conform to ANSI/ASME B.18.2.1. Dimensions and installation shall conform to requirements described in the National Design Specification (NDS), 2012 edition.

1.2 FABRICATION

A. Lumber:

1. Air- or kiln-dry to maximum 19 percent moisture content, at the time of installation.
2. Furnish S4S unless otherwise noted.
3. Size to conform to rules of governing standard. Sizes shown are nominal unless otherwise noted.

1.3 SOURCE QUALITY CONTROL

- ### A. Grade Mark each piece of lumber. Marking must be done by recognized agency.

- B. Plywood: Each panel shall be legibly identified as to type, grade and specie by APA grade. If plies are spliced, the slope of the scarf shall not be steeper than 1:8. White pockets will not be permitted in face plies.
- C. Each piece of preservative treated lumber shall bear AWPA quality stamp by an ALSC approved inspection agency indicating compliance with the AWPA standards.

END OF SECTION

SECTION 06 17 33

WOOD I-JOISTS

PART 1 PRODUCTS

1.1 MANUFACTURER

A. Red-Built. Product: Red-I joists; ICC ESR-2994.

1. Inspection of fabrication of wood I-joists by substituted manufacturers will be required.

1.2 MATERIALS

A. Lumber Grading Rules: WCLIB, WWPA.

B. Flanges: Micro-laminated veneer lumber, manufactured according to the manufacturer's standards as specified in current evaluation report.

C. Webs: APA rated sheathing conforming to PS1 of approved size, unsanded. Plywood shall be Structural 1, CD; Oriented strand board shall be Performance Plus, Exposure I.

D. Joist Bridging: Type, size and spacing as shown on the structural drawings and per manufacturer's requirements.

1.3 ACCESSORIES

A. Adhesive: ASTM D2559; Type as recommended by fabricator of joists for wet condition of service.

B. Wood Blocking, Support Members and Framing for Openings: In accordance with Section 06 10 00.

C. Fasteners: Hot dip galvanized steel, type to suit application.

D. Blocking Panels: As indicated on Drawings.

1.4 FABRICATION

A. Fabricate joists to achieve structural requirements specified.

B. Web stiffeners at bearing points of joist shall be installed at the plant.

END OF SECTION

SECTION 06 17 36
METAL-WEB WOOD JOISTS

PART 1 PRODUCTS

1.1 MANUFACTURER

- A. Truss Joist Mac Millian Product: TJS.

1.2 MATERIALS

- A. Lumber Grading Rules: NFPA, WCLIB, WWPA.
- B. Flanges: Micro-laminated veneer lumber, manufactured according to the standards of Trus-Joist Corp. as specified in report NER-126.
- C. Metal Web: Tubular steel members with 45,000 psi minimum yield. Diameter of tubing as indicated on the drawings. Gage as required to meet structural design requirements.
- D. Joist Bridging: Type, size and spacing as shown on the structural drawings.

1.3 ACCESSORIES

- A. Adhesive: ASTM D2559; Type as recommended by fabricator of joists, for wet condition of service.
- B. Wood Blocking, Support Members and Framing for Openings: In accordance with Section 06 10 00.
- C. Fasteners: Hot dip galvanized steel, type to suit application.
- D. Blocking Panels: As shown on the drawings.

1.4 FABRICATION

- A. Fabricate joists to achieve structural requirements specified.

END OF SECTION

SECTION 06 17 53

SHOP-FABRICATED WOOD TRUSSES

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Truss manufacturer shall be a company specializing in manufacturing the products specified in this Section.

1.2 MATERIALS

- A. Lumber Grading Rules: AFPA, WCLIB and WWPA.
- B. Wood Members: Single or multiple top and bottom chord, 19 percent maximum and 11 percent minimum moisture content.
- C. Steel Plate Connectors: ASTM A653/A653 steel, Grade B, hot dip galvanized; die stamped with integral teeth.
- D. Truss Bridging: Type, size and spacing recommended by truss manufacturer.

1.3 ACCESSORIES

- A. Wood Blocking, Plating, Support Members and Framing for Openings: In accordance with Section 06 10 00.
- B. Fasteners and Anchors: Hot dipped galvanized steel.
- C. Bearing Plates: Electro-galvanized.

1.4 FABRICATION

- A. Fabricate trusses to achieve structural requirements specified.
- B. Brace wood trusses for support in accordance with BCSI-1.
- C. Provide bottom and top chord extensions as indicated.
- D. Fabricate to achieve minimum end bearing of 2-3/4 inches.
- E. Frame special sized openings in web framing as shown to accommodate ducts.

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 PRODUCTS

1.1 MATERIALS

- A. Wood Wallcovering: Arbor Series, Cherry, American Flat Cut wood veneer as manufactured by RJF International Corporation or accepted equal, conforming to the following:
 - 1. Veneer Grade: AA-Architectural.
 - 2. Finish: Pre-finished, Ultra 30 three coat urethane finish with 30 percent sheen.
 - 3. Fire classification: Class A:
 - a. Flamespread: 10 per ASTM E84.
 - b. Smoke Developed: 25 per ASTM E84.
- B. All Material Grades and Construction shall be WI Custom Grade, including all supplements, unless specified or indicated otherwise. Semi-exposed and other components shall be as permitted by WI/AWMAC North American Architectural Woodwork Standards for construction quality specified herein except as otherwise detailed or specified. Moisture content shall be in accordance with WI/AWMAC North American Architectural Woodwork Standards.
- C. Interior Trim, Opaque Finish: Birch, solid stock, S4S, sizes and configurations as indicated on Drawings.
- D. Interior Hardwood Trim, Transparent Finish: WI custom grade birch, S4S, solid stock, sizes and configurations as indicated on Drawings.
- E. Interior Plywood:
 - 1. Plywood back boards for electrical, telephone, and similar types of wall mounted equipment shall be provided as indicated and as required by design conditions. Unless otherwise specified, plywood shall be 3/4 inch thick, fire-retardant treated, exterior A-C plywood with "A" face exposed.
- F. Architectural Wall Panel System: System Four as manufactured by Marlite or accepted equal. System shall consist of the following components:
 - 1. Panels: Flat cut maple wood veneer, SSV-253 with vertical grain and Class II flamespread. Panels shall be 1/4 inch thickness if adhesive applied and 3/4 inch thickness if clip system by custom sizes.
 - 2. Joinery: All edges shall be square cut with face edges beveled. All edges shall be sealed.
 - 3. Hardware: Horizontal Narrow Mainrunners notched at 24 inches on center. and Vertical Narrow Crossrunners with ends notched. Provide Narrow Flat Battens. All hardware shall have a black anodized finish.
 - 4. Trim: Shadowline decorative trim at perimeter conditions. All trim shall have a black anodized finish.

G. Adhesives:

1. For Exterior Work: CS 35-61 Type I (fully waterproof). Shall withstand shear and cyclic boil tests specified in PS 51-71.
2. For Interior Work: CS 35-61 Type II (water-resistant). Shall withstand cold-soak tests specified in PS 51-71.
3. For Architectural Wall Panel System: Marlite C-109 or accepted equal.
4. Adhesives shall meet VOC requirements of South Coast Air Quality Management District (SCAQMD) Rule No. 1168; VOC not to exceed 50 g/L.

H. Fasteners: Bright finish nails for interior work; aluminum or galvanized nails for exterior work. Screws shall be cadmium plated.

1.2 FABRICATION, GENERAL

- A. Moisture content for all finish carpentry shall be between six percent and twelve percent, consistent with the average atmospheric conditions at the project.
- B. Scribing Allowance: Provide at walls, ceilings, etc., in accordance with WI/AWMAC North American Architectural Woodwork Standards.
- C. Trim Members shall have the reverse side "backed out" when they are 5/8 inch thick or more, or 1-5/8 inch or more wide.
- D. Surfaces: Machine sanded on all flat top face areas, smoothly machine run in all depressed flat surfaces and on molded contours. Sander marks shall be fine enough to be completely concealed by the painter's applied finish work. All members shall be finished true and straight, with all edges clean cut and all exposed surfaces free from all working defects.
- E. Lengths shall be those usually available in the species specified.
- F. Milling: All finish carpentry and millwork members shall be milled to dimensions and profiles indicated. Provide surface applied or plowed stops of the profile and dimension shown. Except where exact lengths can be determined, all members and materials shall be provided "long" for cutting and fitting in the field. Built-up members shall be fabricated as detailed and shall be carefully assembled to provide a finished product that is free from warp and defects and is true to line.
 1. Assemble in the mill in as large units as practicable to minimize field cutting and fitting. Where necessary to fit at the site, provide ample allowance for cutting and fitting.

END OF SECTION

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 PRODUCTS

1.1 SYSTEM DESCRIPTION

- A. Casework design and construction shall be in accordance with WI/AWMAC North American Architectural Woodwork Standards as follows:
 - 1. Grade: Custom.
 - 2. Construction Style: A – Frameless.
 - 3. Construction Type: Type I – Multiple Self Supporting Units.
 - 4. Door and Drawer Front Style: Flush overlay.
 - 5. Shelves: Conform to WI requirements subject to a fifty pounds per square foot uniformly spaced load not to exceed 200 pounds per shelf.
 - 6. Provide seismic anchorage in accordance with CBC.
 - 7. Non-housing casework will not be permitted.

1.2 SPECIAL ENVIRONMENTAL REQUIREMENTS

- A. Provide composite wood products whose bonding agents contain no urea-formaldehyde.

1.3 LUMBER

- A. Lumber: Conform to PS 20; Premium Grade in accordance with WI/AWMAC North American Architectural Woodwork Standards, Section 3. Dimensions as shown on Drawings. Properties as follows:
 - 1. Moisture Content: Kiln dried; moisture content six percent to twelve percent.
 - 2. Wood Species:

Use	Species
Framing, internal construction.	Douglas Fir

1.4 WOOD BASED PANELS

- A. Formaldehyde emissions of wood-based panels shall not exceed limits established by the Department of Housing and Urban Development (HUD) and 24 CFR, Section 3208.308. Products containing urea-formaldehyde resins shall not be allowed.
- B. Softwood Plywood: Veneer-core plywood; conforming to PS 1, Exposure 1, Grade A-A, Group 1. Nominal thickness shall be as indicated in this Section and as shown on Drawings.
- C. Particleboard: Meets or exceeds ANSI A208.1, Class M2, NAF resin, minimum 45 pounds per cubic foot density. At wet areas, meet moisture resistant specifications for ANSI MR30 per ASTM D1037 for 24 hour water absorption.
 - 1. Products:
 - a. Encore as manufactured by SierraPine or accepted equal.
 - b. FreeForm as manufactured by Collins Pine or accepted equal.

- D. Medium Density Fiberboard (MDF): Meets or exceeds ANSI A208.2, Class SDF, NAF resin, minimum 45 pounds per cubic foot density. At wet areas, meet moisture resistant specifications for ANSI Grade 155 MR50 per ASTM D1037 for 24 hour water absorption.
 - 1. Products:
 - a. Standard MDF: Medite II as manufactured by SierraPine or accepted equal.
 - b. Moisture-Resistant MDF: Medex as manufactured by SierraPine or accepted equal.
- E. Hardboard: ANSI 135.4, Class 1 – Tempered; smooth-one-side (S1S), minimum sixty pounds per cubic foot density.
- F. Thermally Fused Melamine: Thermoset decorative overlays pre-laminated to substrate (hardboard, particleboard, or MDF as specified in this Section) by thermal fusion; performance characteristics equal to a general purpose grade or liner grade high pressure laminate as per NEMA LD3.

1.5 PLASTIC LAMINATE

- A. Manufacturers:
 - 1. Acceptable Manufacturers:
 - a. Nevamar Decorative Surfaces, a division of Panolam Industries International, Inc., Shelton, CT; 877-726-6526; www.nevamar.com.
 - b. Formica Corporation, Cincinnati, OH; 800-367-6422; www.formica.com.
 - c. Wilsonart International, Temple, TX; 800-433-3222; www.wilsonart.com.
 - d. Pionite Decorative Surfaces, a division of Panolam Industries International, Inc., Shelton, CT; 877-726-6526; www.pionite.com.
 - e. Lamin-Art, Inc., Schaumburg, IL; 800-323-7624, www.laminart.com.
 - f. Abet Laminati, Richmond, CA; 800-228-2238; www.abetlaminati.com.
- B. High-Pressure Decorative Laminates: NEMA LD3; grades and thickness as follows:

Use/Application	NEMA LD3 Grade	Min. Thickness
Horizontal surface where postforming is not required.	HGS or HGL	0.048 inch ± 0.005 inch
Exposed vertical surfaces of casework components where postforming is not required.	VGS	0.028 inch ± 0.004 inch
Cabinet liner.	CLS	0.020 inch
Backing sheet. Provide at backside of plastic laminated panel substrates to enhance dimensional stability where laminate finish is applied to only one surface.	BK	0.020 inch

- C. Colors: As selected by Architect from manufacturer’s full range of colors.

1.6 SOLID SURFACING

A. Manufacturers and Products:

1. Acceptable Manufacturers and Products:

- a. Corian Solid Surfaces / DuPont, Wilmington, DE; 800-426-7426, www.corian.com. Product: Corian.
- b. LG Hausys, Atlanta, GA; 865-544-4622, www.lgsurfaces.com. Product: Hi-Macs.
- c. Aristech Acrylics LLC, Florence, KY; 800-428-6648, www.avonite.com. Product: Avonite Solid Surfacing.
- d. Wilsonart International, Temple, TX; 800-433-3222, www.wilsonart.com. Product: Wilsonart Solid Surface.
- e. LivingStone, Austin, TX; 866-433-2229, www.livingstonesurfaces.com. Product: Heartland.

B. Solid Surfacing: Non-porous homogeneous blend of acrylic or polyester alloys and fillers creating a solid surfacing material. Color and pattern shall extend throughout the material.

1. Thickness: 1/2 inch, unless otherwise indicated on Drawings.
2. Color: As selected by Architect from manufacturer's full range of colors.

C. Solid Surfacing Accessories:

1. Joint Adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous non-porous joints, with a chemical bond.
2. Panel Adhesive: Manufacturer's standard neoprene-based panel adhesive.
3. Sealant: Manufacturer's standard mildew resistant, FDA and UL recognized silicone sealant in color matching or clear formulations.

1.7 QUARTZ SOLID SURFACING MATERIAL

A. Products and Manufacturers:

1. Acceptable Products and Manufacturers:

- a. Corian Quartz by DuPont, Wilmington, DE; 800-426-7426, www2.dupont.com.
- b. Avonite Solid Surfacing by Aristech Acrylics LLC, Florence, KY; 800-428-6648, www.avonite.com.
- c. Gibraltar Solid Surface by Wilsonart International, Temple, TX; 800-433-3222, www.wilsonart.com.
- d. Silestone Stellar Series by Cosentino USA, Inc., Sugar Land, TX; 877-532-6394, www.silestoneusa.com.
- e. CaesarStone Quartz Surfacing by CaesarStone USA, Inc., Van Nuys, CA; 877-978-2789, www.caesarstoneus.com.

B. Solid Surfacing Material (SSM): Homogeneous quartz surface composed of approximately 93 percent crystalline silica bound in polymer creating a solid surfacing material. Color and pattern shall extend throughout the material.

1. Thickness: 3/4 inch, unless otherwise indicated on Drawings.
2. Color: As selected by Architect from manufacturer's full range of colors.

C. Properties:

1. Flexural Strength: >5,300 psi, per ASTM D790.
2. Flexural Modulus: 5.3–5.7E6 psi, per ASTM D790.
3. Compressive Strength (Dry, Wet): ~27,000 psi, ~24,000 psi, per ASTM C170.
4. Hardness: 7, Mohs' Hardness Scale.
5. Fungal Resistance: No growth, per ASTM G21.
6. Freeze-Thaw Cycling: Unaffected, per ASTM C1026.
7. Point Impact: Passes ANSI Z 124.6.4.2
8. Ball Impact: 164 inches, per NEMA LD 3.3.8, based on NEMA LD 3-2000.
9. Abrasion Resistance: 139, per ASTM C501.
10. Density: ~2400 kg/m³.
11. Flammability: ASTM E84, UL 723 (Class I and Class A) and NFPA 255
12. Flame Spread Index: FSI <15 for 3/4-inch.
13. Smoke Developed Index: <100 for 3/4-inch.
14. Nominal Weight: Ten pounds per square foot.

D. Solid Surfacing Accessories:

1. Joint Adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous non-porous joints, with a chemical bond.
2. Panel Adhesive: Manufacturer's standard neoprene-based panel adhesive.
3. Sealant: Manufacturer's standard mildew resistant, FDA and UL recognized silicone sealant in color matching or clear formulations.

1.8 ACCESSORIES

- A. Edge Banding: PVC vinyl; 0.125 inch (3 mm) thick by 15/16 inch wide. Color and pattern shall closely match exposed door and drawer front laminate color and pattern as accepted by Architect.
- B. Vinyl Countertop Edge: PVC vinyl; 0.125 inch (3 mm) thick. Color and pattern shall closely match countertop laminate color and pattern as accepted by Architect.
- C. Fasteners: Nails, screws, and other fasteners of size and type best suitable for the purpose. Staples, screws or T-nails not permitted at exposed surfaces. Staples and nails not permitted in casework joinery.
- D. Adhesives, Caulks, and Sealants:
 1. Adhesives shall meet VOC requirements of South Coast Air Quality Management District (SCAQMD) Rule No. 1168. Sealants and fillers shall meet or VOC requirements of Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 51.
 2. Adhesives shall be selected for their ability to provide a durable, permanent bond and shall take into consideration such factors as materials to be bonded, expansion and contraction, bond strength, fire rating, and moisture resistance.
 3. Wood Joinery: CS 35-61 Type II (water-resistant). Shall withstand cold-soak tests specified in ANSI/HPVA HP-1.

4. Laminate Adhesive: Water-based contact adhesive, type recommended by plastic laminate manufacturer.
5. Caulk: Clear, 100 percent silicone – use to fill voids and joints between laminated components and adjacent surfaces.
6. Sealant: Mold and mildew resistant; type and composition recommended by substrate manufacturer to provide a moisture barrier at sink cutouts and other locations where unfinished substrate edges may be subjected to moisture.

1.9 CABINET HARDWARE

- A. Hardware shall be furnished and installed as required to provide for a complete and operable casework installation. All hardware shall conform to ANSI/BHMA 156.9 Grade 2, except where a higher grade is specified.
- B. Manufacturers:
 1. Acceptable Manufacturers:
 - a. Accuride International, Inc., Santa Fe Springs, CA; 562-903-0200, www accuride.com.
 - b. Amerock Corp., Mooresville, NC; 800-435-6959; www.amerock.com.
 - c. Blum Inc, Stanley, NC; 800-438-6788; www.blum.com.
 - d. Doug Mockett & Company, Inc., Torrance, CA; 800-523-1269, www.mockett.com.
 - e. EPCO – The Engineered Products Co., Flint, MI; 888-414-3726 www.epcohardware.com.
 - f. Grass America, Inc., Kernersville, NC; 800-334-3512, www.grassusa.com.
 - g. Häfele America Co., Archdale, NC; 800-423-3531, www.hafele.com.
 - h. Hettich America L.P., Buford, GA; 800-777-1772, www.hettichamerica.com.
 - i. Knape & Vogt Mfg. Co., Grand Rapids, MI; 800-253-1561, www.knapeandvogt.com.
 - j. National Cabinet Lock / CompX International Inc., Mauldin, SC; 864-297-6655, www.compnet.com/national.html.
 - k. Olympus Lock, Inc., Lynnwood, WA; 800-525-0954, www.olympus-lock.com.
 - l. RPC – Rockford Process Control, Rockford, IL; 815-966-2000, www.rockfordprocess.com.
- C. Overlay Institutional Hinges: ANSI/BHMA 156.9 Grade 1.
 1. European type; semi-concealed; zinc die cast cup and hinge arm assembly; nickel plated finish. Products: Blum CLIP top No. 71T6550 full overlay hinge arm with No. 173H7100 hinge cup, Grass America No. M811.328.11.25 full overlay hinge arm with No. M690.030.11.25 hinge cup, Häfele Aximat SM, or accepted equal.
- D. Wire Pulls: 4 inch x 1-3/8 inch x 5/16 inch diameter steel handle; nickel matt finish. Product: Häfele Cat. No. 116.09.617, Epcoc Cat. No. MC401-4-DC, or accepted equal.
- E. Drawer Slides:
 1. Pencil drawers: Full extension; steel ball bearings; hold-in detent; silenced in and out; low profile; 1/2 inch side space; minimum 50 pounds rated load. Product: Accuride Model No. 2632, Knape & Vogt Model No. 8400, or accepted equal.

2. Box drawers: Full extension; steel ball bearings; hold-in detent; progressive movement; 1/2 inch side space; 100 pounds rated load. Product: Accuride Model No. 3832, Knape & Vogt Model No. 8405, or accepted equal.
 3. File drawers (up to 24 inches wide): Minimum 1 inch over travel; steel ball bearings; hold-in detent; progressive movement; 1/2 inch side space; 150 pounds rated load. Product: Accuride Model No. 4034, Knape & Vogt Model No. 8505, or accepted equal.
- F. Adjustable Shelf Supports: ANSI/BHMA 156.9 Grade 1; nickel plated zinc die-cast shelf supports, 5 mm pin diameter with additional pin for shelf. Product: Hettich Sekura 6 Cat. No. 079707, Häfele Cat. No. 282.24.720, or accepted equal.
- G. Countertop Bracket: Steel; gray primed; load capacity 500 kg per pair. Product: Häfele Hebgo bracket Cat. No. 287.45.4XX (use length to match countertop depth), or accepted equal.
- H. Elbow Catch: Heavy duty solid brass. Product: Epco Part No. 1018-N, or accepted equal.
- I. Cabinet Locks:
1. Single: Deadbolt locks with 90 degree turn; key removable in both locked and unlocked positions. Provide two keys per lock. Provide strike bars at doors and angle strikes at drawers. Cylinder lengths: 7/8 inch at doors and 1-3/8 inch at drawers. Finish: US26D, satin chrome. Products:
 - a. Doors: CompX National C8173, Olympus 100DR, or accepted equal.
 - b. Drawers: CompX National C8179, Olympus 200DW, or accepted equal.
 2. Gang Lock (face mounted): Disc tumbler gang lock for locking drawers in desk pedestals and multiple drawer applications. Key removable in both locked and unlocked positions. Product: CompX National D8838 with core plug, or accepted equal.
 3. Gang Lock (side mounted): Disc tumbler gang lock for locking drawers in desk pedestals and multiple drawer applications. Key removable in both locked and unlocked positions. Product: National D8090-14A, or accepted equal.
 4. All casework locks and keying shall match facility's casework needs and keying system. Locks shall be keyed in groups per functional operations.
- J. Cable Grommets: 2-1/2 inch diameter plastic grommet; black color. Product: Doug Mockett & Company, Inc. Model EDP (flip-top tab), Häfele Cat. No. 429.99.324 (spring-loaded rotating segment in cover), or accepted equal.

1.10 FABRICATION

- A. Fabricate and assemble casework components at the shop site to the maximum extent possible. Construction and fabrication of cabinets and their components shall meet or exceed WI grade requirements as indicated in this Section.
- B. Closely fit casework at site. Provide filler inserts and trim where necessary, scribe for a tight fit.
- C. Provide cutouts for inserts, grommets, and fittings. Install grommets where indicated on the drawings after site verification of locations and dimensions. Seal surfaces of cut edges.
- D. Operable parts for all accessible casework shall comply with CBC Section 11B-309.

E. Plastic Laminates:

1. Apply plastic laminate in full uninterrupted sheets, consistent with manufactured sizes.
2. Fit corners and joints hairline. Slightly bevel arises.
3. Secure plastic laminated panels with concealed fasteners.
4. Apply laminate backing sheets to reverse side of panels with high-pressure decorative laminates on one face.

F. Sheet Materials Application:

Use/Application	Thickness	Wood-Based Panel
Casework carcass.	Min. 3/4 inch	Plywood, Particleboard, or MDF
Doors and drawer false fronts.	3/4 inch	Particleboard or MDF
Drawer box. Sides, backs, and subfronts. Bottom.	Min. 1/2 inch, Max. 5/8 inch	Plywood, Particleboard, or MDF
	Min. 1/4 inch	Hardboard or MDF
Cabinet backs.	Min. 1/4 inch	Hardboard or MDF
Laminate clad countertops.	Min. 3/4 inch	Plywood, Particleboard, or MDF
Shelves: up to 32 inch span.	Min. 3/4 inch	Plywood, Particleboard, or MDF
Shelves: 32 inch up to 49 inch span.	Min. 1 inch	Plywood

G. Casework Carcass:

1. Glue frame components together. Brace top corners, bottom corners and cabinet bottoms with hardwood blocks, or metal or plastic braces.
2. Joinery Method: Acceptable joinery methods shall be as follows:
 - a. Tops, exposed ends, and bottoms:
 - 1) Steel European assembly fasteners 1-1/2 inch from end, 5 inches on center. Fasteners shall not be visible on exposed parts.
 - 2) Doweled and glued under pressure – approximately four dowels per 12 inches of joint.
 - 3) Stop dado, glued under pressure, and either nailed or screwed. Fasteners shall not be visible on exposed parts.
 - 4) Spline or biscuit and glued under pressure.
 - b. Cabinet backs (wall hung cabinets):
 - 1) Wall hung cabinet backs must not be relied upon to support the full weight of the cabinet and its anticipated load for hanging/mounting purposes. Method of back joinery and hanging/mounting mechanism should transfer the load to case body members.
 - 2) Fabrication method: Full bound, capture in grooves on cabinet sides, top, and bottom. Cabinet backs for floor standing cabinets shall be side bound, captured in grooves, glued and fastened to top and bottom.

H. Drawer Assembly:

1. Drawer box with drawer false front.

2. Acceptable joinery methods:
 - a. Multiple dovetail (all corners) or French dovetail front/dadoed back, glued under pressure.
 - b. Doweled, glued under pressure.
 - c. Lock shoulder, glued and pin nailed.
 - d. Bottoms shall be set into sides, front, and back, 1/4 inch deep groove, with a minimum 3/8 inch standing shoulder.
 3. File Drawers: Unless otherwise indicated, direction of file folders shall be parallel to drawer door. Provide adequate, clear inside dimensions for hanging file folders. Minimum clear inside drawer dimensions shall be as follows:
 - a. Letter size file folders: Minimum 13-1/4 inch wide by 10-1/2 inch high.
 - b. Legal size file folders: Minimum 16-1/4 inch wide by 10-1/2 inch high.
- I. Shelving:
1. Fixed shelves: Dadoed or doweled into cabinet sides.
 2. Adjustable shelves: 0.197 inch bore holes at 1-1/4 inch on center.
- J. Laminate Countertops and Backsplash:
1. Edge Style: As indicated on Drawings.
 2. Mechanically fasten back splash to countertops at minimum 16 inches on center.
 3. Substrate shall be moisture-resistant where countertops receive sinks, lavatories, or are subject to liquids.

1.11 FINISH

- A. Finish – Laminated Casework:
1. Drawer box: Thermally fused melamine.
 2. Semi-exposed surfaces, as defined in WI/AWMAC North American Architectural Woodwork Standards Section 10:
 - a. Cabinet with doors: Thermally fused melamine.
 - b. Cabinets with open shelves: High-pressure decorative laminate.
 3. Exposed surfaces, as defined in WI/AWMAC North American Architectural Woodwork Standards Section 10: High-pressure decorative laminate with PVC edge banding.
 4. Doors and drawer false fronts: High-pressure decorative laminate with PVC edge banding.

END OF SECTION

SECTION 07 13 26

SELF-ADHERING SHEET WATERPROOFING

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Basis-of-Design: Grace Construction Products, Products:

1. Below Grade Vertical Surfaces and Between Exterior Concrete Structural and Topping Slabs: Bituthene 4000.
 - a. Deck Treatment: Bituthane Deck Prep Surface Treatment.
 - b. Drainage composite.
 - c. Protection board.
2. Below Grade Horizontal Surfaces: Preprufe 300R Plus.
3. Metal Roof: Grace Ice and Water Shield HT.
4. Primer: Perm-A-Barrier WB Primer or Perm-A-Barrier Primer Plus

B. Carlisle.

C. W. R. Meadows.

1.2 MATERIALS – BELOW GRADE VERTICAL SURFACES AND BETWEEN CONCRETE SLABS

- A. Elastic Sheet Membrane Waterproofing: 1.5 mm thick composite of rubberized asphalt and cross-laminated high density polyethylene carrier film.
- B. Surface Conditioner: Water based latex surface treatment, V.O.C. compliant.
- C. Cant Strips: Formed from Bituthene Liquid Membrane.
- D. Protection Board: 1/4 inch thick, bitumen and mineral core between two reinforcing liners as manufactured by Grace Construction Products or accepted equal.
- E. Protection Board Adhesive: Bituthene protection board adhesive, fast-drying rubber-based cement.
- F. Prefabricated Drainage Composite: Hydroduct 220 for vertical applications as manufactured by Grace Construction Products or accepted equal.
- G. Mastic Joint Sealant: Bituthene mastic, black rubberized asphalt mastic.
- H. Adhesive Tape: Bitustik Tape; aggressive two-sided adhesive tape used for adhering prefabricated drainage composites to waterproofing membranes.

1.3 MATERIALS – BELOW GRADE HORIZONTAL SURFACES

- A. Elastic Sheet Membrane Waterproofing: 1.2 mm thick multilayered composite of heavy duty HDPE film, synthetic pressure sensitive adhesive, weather-resistant protective coating, and an adhesive-to-adhesive seam overlap.

- B. Accessories: Membrane manufacturer's tape and liquid membrane specifically designed for use with horizontal waterproofing membrane.

1.4 MATERIALS – ROOF AREAS

A. Elastic Sheet Membrane Waterproofing:

1. Material: Cold applied, self-adhering membrane composed of a rubberized asphalt adhesive and interwound with a disposable release sheet. Provide an embossed, slip resistant surface on the high performance film with UV barrier properties.
2. Membrane Thickness: 40 mils per ASTM D3767 Method A.
3. Membrane Tensile Strength: MD 33 lbf/in, CD 31 lbf/inch per ASTM D412 Die C Modified.
4. Membrane Elongation: 250 percent per ASTM D412 Die C Modified.
5. Low Temperature Flexibility: Unaffected at -20 degrees F per ASTM D1970.
6. Maximum Permeance: 0.05 perms per ASTM E96.
7. Maximum Material Weight Installed: 0.22 pounds per square foot per ASTM D461.
8. Service Temperature: 240 degrees F per ASTM D1204
9. Adhesive: Rubberized asphalt adhesive containing post-consumer recycled content, contains no calcium carbonate, sand or fly ash.
10. Exposure: Can be left exposed for a maximum of 120 days from date of installation per ASTM G90 – EMMAqua test.

- B. Primer: VOC compliant, low odor, water-based primer provided by sheet waterproofing manufacturer, which imparts a high tack finish on the treated substrate.

END OF SECTION

SECTION 07 19 00

WATER REPELLENTS

PART 1 PRODUCTS

1.1 MATERIALS

- A. Clear Liquid Waterproofing: Sure Klean Weather Seal Siloxane WB as manufactured by PROSOCO, conforming to local Air Pollution Control District V.O.C. requirements as well as the following:
 - 1. The water repellent shall be a concentrated solvent-free blend of silanes and oligomeric alkoxy siloxanes designed for dilution with fresh water at the jobsite. This solution shall produce a mechanical and chemical interlocking bond within the substrate to the depth of penetration assuring uniform waterproofing throughout the treated area and will not darken, produce a surface film or impair the natural breathing characteristics of treated surfaces.

1.2 EQUIPMENT

- A. Material shall be applied by a low-pressure applicator at 20 psi. Set sprayer for wet stream. Avoid atomization of the material.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 PRODUCTS

1.1 GLASS FIBER INSULATION

A. Acceptable Manufacturers:

1. EcoBatt by Knauf Insulation, Shelbyville, IN; 317-398-4434, www.knaufusa.com.
2. Owens-Corning, Toledo, OH; 800-438-7465, www.owenscorning.com.
3. Certainteed Corp., Insulation Group, Valley Forge, PA; 800-233-8990, www.certainteed.com.
4. Johns Manville, Denver, CO; 800-654-3103, www.specJM.com.
5. Thermafiber, Inc., Wabash, IN; 888-834-2371, www.thermafiber.com.

B. Batt Insulation: Preformed glass fiber batt in accordance with 2016 CBC Section 720, California Referenced Standards Code Chapter 12-13, ASTM E84, and UL 723, conforming to the following:

1. Facings:
 - a. Faced on one side with foil reinforced kraft (FSK) face; Type III, Class A per ASTM C665; flame spread 25 and smoke developed 50 per ASTM E84.
2. Provide formaldehyde-free thermal insulation products.
3. Recycled Content: Minimum 30 percent post-consumer.

C. Accessories:

1. Tape: Polyester self-adhering type, mesh reinforced, 2 inches wide.

1.2 RIGID SHEATHING/INSULATION

A. Acceptable Manufacturers:

1. Dow Building Solutions, Midland, MI; 866-583-2583, www.dowbuildingmaterials.com. Product: Thermax Sheathing.
2. Rmax, Inc., Dallas, TX; 800-527-0890, www.rmax.com. Product: TSX-8500.
3. Atlas Roofing Corporation, Atlanta, GA; 770-952-1442, www.atlasroofing.com. Product: EnergyShield Pro.

B. Rigid Sheathing Insulation: ASTM C1289, Type I, Class 1 or Class 2, Grade 3; polyisocyanurate foam core bonded to 1.0 mil thick smooth reflective aluminum foil facers on both faces.

1. Thickness: 1 inch minimum.
2. Compressive Strength: 25 psi minimum per ASTM D1621.
3. Surface Burning Characteristics: Flame Spread: 25; Smoke Developed: less than 450 per ASTM E84.
4. Thermal Resistance Value: Minimum 6.5 per inch of thickness per ASTM C518.

C. Accessories:

1. Fasteners: Insulated sheathing manufacturer's recommended polymer or other corrosion protective coated steel screw fasteners and washers for anchoring sheathing to metal wall framing. Fastener length and size based on wall sheathing thickness.
2. Liquid Spray Flashing: Insulation manufacturer's recommended board joint commercial liquid spray flashing and sealant for sealing joints, seams, window openings, door openings, counter-flashing, and penetrations through the insulation layer.
3. Flashing Tape: Insulation manufacturer's recommended tape for counter-flashing and penetrations through the insulation layer. Tape shall meet ASTM C711 for self-adhering flashing.
4. Penetration Filler: Insulated sheathing manufacturer's recommended single-component polyurethane low-pressure foam sealant for sealing penetrations of insulated sheathing, meeting ASTM E84 standard test method for surface burning characteristics of building materials.
5. Gap Air Infiltration Filler: Insulated sheathing manufacturer's recommended two component, quick cure polyurethane foam, meeting ASTM E84 standard test method for surface burning characteristics of building materials.

END OF SECTION

SECTION 07 24 00
 EXTERIOR INSULATION AND FINISH SYSTEMS

PART 1 PRODUCTS

1.1 ACCEPTABLE MANUFACTURERS

- A. Dryvit, Class PB System.
- B. ParexLahabra.
- C. Sto.

1.2 MATERIALS

- A. Adhesive: Acrylic-based product meeting bond strengths as per ASTM D897.
- B. Portland Cement: ASTM C150, Type 1, fresh and free from lumps.
- C. Air/Weather Barrier: 100 percent acrylic material field mixed with Portland cement in a 1:1 ratio by weight. Barrier shall be installed over a silicone-treated gypsum core sheathing surfaced with inorganic fiberglass mats complying with ASTM C1177.
- D. Insulation Board: Expanded polystyrene, ASTM C578, Type L.
 - 1. Manufacturer shall be capable of producing molded expanded polystyrene (EPS) in accordance with current ASTM C578 Specification for Insulation Board and shall subscribe to the ICC Third Party Certification and Quality Assurance Program.
 - 2. Insulation board and/or packaging shall be labeled with pertinent information required by the EIFS manufacturer, the approved listing agency, and the applicable building code.
 - 3. Flame spread shall not exceed 25 per ASTM E84 or UL 723.
 - 4. Thickness shall be as indicated on drawings.
- E. Acrylic Adhesive Base:
 - 1. The acrylic adhesive base shall be a hard, breathing type bonding layer.
 - 2. This bonding layer shall be of an especially prepared mastic type material applied in a thickness sufficient to completely embed the reinforced fabric.
 - 3. The strength of the shear bond on the surface of the insulation board shall be sufficient to develop the full tensile strength of the reinforcing fabric.
- F. Mesh: Shall be a balanced, open weave, glass fiber fabric, treated for compatibility with other system materials in the following weights:

Reinforcing Mesh/Weight (ounces per square yard)	EIMA Impact Class.	EIMA Impact Range (inch-pounds)	Impact Test Results (inch-pounds)
Standard – 4.3	Level 1	25-49	36
Standard Plus – 6	Level 2	50-89	56
Intermediate – 12	Level 3	90-150	108

Panzer 15* – 15	Level 4	>150	162
Panzer 20* – 20.5	Level 4	>150	352
Detail Short Rolls –	N/A	N/A	N/A
Corner Mesh – 7.2	N/A	N/A	N/A

*Shall be used in conjunction with Standard Mesh

G. Acrylic-Based Finish:

1. The acrylic-based finish shall be of a hardening, air cured, mastic type material.
2. It shall form a breathing type coating, fully bonded and compatible with the acrylic adhesive base to which it is applied.
3. The acrylic-based finish color shall be factory mixed and integral. Color and texture shall be as selected by Architect. Color and texture shall comply with the accepted sample.

H. Water: Clear, clean and potable with any foreign matter in solution which might affect the color or setting qualities of the cement, adhesive or finish coat.

I. System using mechanical fasteners will not be accepted.

J. Single part silicone sealant and backing rod shall be those specifically recommended by the manufacturer.

1. Sealant shall be 790 series as manufactured by Dow Corning, or accepted equal.

1.3 SYSTEM PROPERTIES: THE SYSTEM SPECIFIED SHALL HAVE THE FOLLOWING MINIMUM CHARACTERISTICS AND PROPERTIES.

A. Mechanical properties:

1. Tensile bond strength of adhesive – insulation board to:
 - a. Gypsum Sheathing: 1,200 psf.
2. Freeze/Thaw resistance: +20 degrees C to -10 degrees C. Soaked at 20 degrees C four days, then -10 degrees C for two hours and +10 degrees C for two hours.
 - a. Results: 60 cycles with no checking, cracking or splitting.
3. Water Vapor Transmission: ASTM E96/E96M.
 - a. Insulation board: 1.2 perm-inch to 2.0 perm-inch.
 - b. Plaster lamina: 9.75 perm.

B. Weathering Properties:

1. Accelerated weathering: 2,000 hours per ASTM G155.
2. Salt spray resistance: 300 hours – Five percent salt concentration per ASTM B117.
3. Falling sand abrasion: 500 liters – no deleterious effects per ASTM D968.
4. Moisture resistance: 14 days – no deleterious effects per ASTM D2247.
5. Mildew resistance: Mil Stds. 810B – no growth of mildew.

1.4 MIXING

A. Acrylic-based adhesive:

1. Use a clean container, free of all foreign substances, for mixing and preparing material. Do not use a container which has been used for or cleaned with a petroleum product.

2. Use a mixer similar to Goldblatt Jiffler Mixer No. 15311H7 powered by a 1/2 inch drill, 400 rpm-500 rpm. After mixing clean immediately with water.
 3. Stir acrylic-based adhesive before adding Portland cement to assure homogeneous material.
 4. Mix Portland cement with acrylic-based adhesive in a ratio of one part Portland cement to one part acrylic-based adhesive.
 - a. Measure quantities of adhesive and Portland cement separately before mixing.
 - b. Add Portland cement to adhesive in small increments while thoroughly mixing each increment.
 5. Water may be added to adjust workability.
 6. Pot life for mixed acrylic-based adhesive should be the same as ordinary mortar or plastic materials. Keep container closed when not in use.
 7. No additives such as rapid binders, anti-freeze, accelerators, etc. shall be added to any material under any circumstances.
- B. Acrylic Finish: Thoroughly mix factory prepared acrylic finish material with the high-speed mixer until a uniform workable consistency is attained. A small amount of clean potable water may be added to adjust workability.

END OF SECTION

SECTION 07 26 50
VAPOR EMISSION CONTROL SYSTEM

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Vapor Emission Control System:

1. Acceptable Manufacturers and Products:

- a. Koster American Corporation, Virginia Beach, VA; phone: 757-425-1206; www.koesterusa.com. Products:
 - 1) Vap I® 2000 Zero VOC.
 - 2) SL Premium Self Leveling Underlayment.
 - 3) SC skim coat finish.
 - 4) Vap I 06 Primer.
- b. Ardex Engineered Cements, Aliquippa, PA; phone: 724-203-5000; www.ardex.com. Products:
 - 1) MC Rapid.
 - 2) Ardex cementitious underlayment products.

B. Relative Humidity and pH Testing Supplies:

- 1. Provide digital RH meter by one of the following or accepted equal:
 - a. Rapid RH 4.0 Easy Reader with Smart Sensors by Wagner Electronics, Rogue River, OR; 800-634-9961, www.wagnermeters.com.
 - b. Hygromaster with HygroStik by GE Sensing, Goleta, CA; 800-472-6075, www.gesensing.com.
 - c. TotalCheck RH Tester by Delmhorst Instrument Co., Towaco, NJ; 877-335-6467, www.delmhorst.com.
 - d. Digital RH Meter: Relative Humidity Meter with probes and sleeves by American Moisture Test, Tustin, CA; 866-670-9700, americanmoisturetest.com.
- 2. Provide digital pH meter by one of the following or accepted equal:
 - a. Model PH100 ExStik® pH Meter by Extech Instruments Corporation, Nashua, NH; 877-239-8324, www.extech.com.
 - b. Model #PH100 by Taylor Tools, Denver, CO; 303-371-7667, www.taylortools.com.
 - c. AMT Concrete Digital Alkalinity-pH Meter by American Moisture Test, Tustin, CA; 866-670-9700, americanmoisturetest.com.

1.2 SYSTEM DESCRIPTION

- A. General: Vapor emission control system shall be warranted to control concrete slab relative humidity up to 100 percent as determined by:
 - 1. Site conditions.
 - 2. Concrete mix design.
 - 3. Age of concrete substrate.

4. Relative humidity in the concrete slab.
 5. pH test results.
 6. Compatibility with finished floor covering products.
- B. System Performance: Installed system shall bring pH levels within the range of 8-9, as determined by pH testing, in one or two coats at all areas indicated to receive a finished floor covering or finish coating.
1. Water Vapor Transmission: ASTM E96 (Water Method); performance of the System shall be documented by an independent testing laboratory. Net perm rate results shall not exceed 0.11 grains h-1 ft-2 in Hg-1.
 2. Relative Humidity Testing: ASTM F2170; the System shall perform as specified with relative humidity test results of 100 percent or less.
 3. Alkaline Exposure Testing: ASTM D1308; insensitivity to alkaline environment up to pH 14 in a 14-day test.
 4. Certified acceptance of exposure to continuous topical water exposure after final curing of the System.
 5. Vapor emission control system shall be applied in one or two coats as required for full performance of System, and shall include a cementitious underlayment over the System for subsequent adhesion of floor covering.
- C. System Materials: Two-component epoxy resin system, 100 percent solids, zero VOCs, containing specifically formulated chemicals and resins to provide the characteristics and properties specified in this Section. Epoxy systems containing water are not allowed.
- D. Accessories: Concrete repair materials, underlayment, and primers used in conjunction with vapor emission control system shall be as recommended by or acceptable to the System manufacturer. Underlayment used over the System shall be acceptable to vapor emission control system, flooring adhesive, and floor covering manufacturers. Underlayment shall attain minimum 5,000 psi compressive strength at 28 days.

1.3 MIXING

- A. Use clean containers and mix System components thoroughly, in accordance with manufacturer's printed instructions, to obtain a homogeneous mixture.

END OF SECTION

SECTION 07 27 26

FLUID APPLIED MEMBRANE AIR AND WATER BARRIERS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Basis-of-Design: Momentive Performance Materials, Inc., Waterford, NY; 877-943-7325, www.ge.com/silicones. Product: GE Elemax* 2600.
2. Dow, Midland, MI; 800-248-2481, www.consumer.dow.com. Product: DOWSIL DefendAir 200.

1.2 MATERIALS

- A. Fluid Applied Air Barrier: GE Elemax* 2600.
- B. Liquid Flashing (Detail Sealant/Adhesive): GE Elemax 5000 Liquid Flashing, GE SCS2000 SilPruf*, GE SCS2700 SilPruf* LM, GE SCS9000 SilPruf* NB or GE SWS.
- C. Reinforcing Fabric: RF100 in 4 inch, 6 inch, or 12 inch widths.
- D. Sheet Flashing: GE Elemax SS Flashing available in 6 inch, 12 inch, 18 inch, 24 inch, or 36 inch widths.
- E. Silicone Transition Membrane: GE UST2200 UltraSpan* in 3 inch, 6 inch, or 12 inch widths.
- F. Pre-cured silicone molded corners: GE USM UltraSpan* inside and outside corners.

1.3 PERFORMANCE REQUIREMENTS

- A. UV Exposure: No Limit.
- B. Application Temperature: 0 degrees F to 150 degrees F.
- C. Performance Properties:

Property	Value ⁽¹⁾	Test Method
Required Dry Film Thickness	17 mils dry	Apply 19 mils wet
Air Permeance – tested at 1.57 psf	0.00004 cfm/ft ²	ASTM E2178
Assembly Air Leakage - tested at 1.57 psf	0.0002 cfm/ft ²	ASTM E2357
Water Resistance	Pass	AATCC 127
Water Penetration	No water penetration observed after 15 minutes at 62.5 psf	ASTM E331
Resistance to Wind-Driven Rain	Pass: No visual leaks or moisture weight gain observed after 24 hours at 26 psf	ASTM D6904

Water Vapor Permeance	10.5 perms at 17 mils DFT	ASTM E96 Procedure BW (Inverted Water Method)
	10.2 perms at 17 mils DFT	ASTM E96 Procedure B (Water Method)
	7.9 perms at 17 mils DFT	ASTM E96 Procedure A (Desiccant Method)
UV and Weathering Resistance	No degradation after 5000 hours	ASTM G154
Self Sealability around Nails	Pass at 17 mils DFT	ASTM D1970
Crack Bridging Ability (1/16" or 1.5mm)	Pass	ASTM C1305
Mildew Resistance	0 - No Growth	ASTM D5590
Service Temperature Range	-40 degrees F to +300 degrees F	
Pull of Strength (concrete)	126 psi	ASTM D4541
Pull of Strength (fiberglass mat faced gypsum sheathing)	44 psi ⁽²⁾	ASTM D4541
Tensile Strength	175 psi	ASTM D412 ⁽³⁾
Elongation	542 percent	ASTM D412 ⁽³⁾
Recoat Time, typical	1 hour to 2 hours	Varies with Temp and RH
Cure Time, complete	1 day to 2 days	Varies with Temp and RH
Multi-Story Wall Assembly Burn Test	Passed in assembly tested and acceptable for use in various wall assemblies per engineering analysis	NFPA 285
Surface Burning	Flame Spread: 10 Smoke Developed: 185 NFPA Class A, CBC Class A	ASTM E84
Oxygen Consumption (Cone) Calorimeter	Effective Heat of Combustion: 9.8 MJ/kg Peak Heat Release Rate: 97 kW/m ² Total Heat Release: 5.6 MJ/m ²	ASTM E1354
ICC-ES AC212: Acceptance Criteria for Water-Resistive Coatings used as Water-Resistive Barrier over Exterior Sheathing		
Sequential Testing- Structural, Racking, Restrained Environmental Conditioning and Water Penetration		
1. Structural	No cracking within the field of the panel, substrate joints and at interface of flashing	ASTM E1233 Procedure A
2. Racking	No cracking within the field of the panel, substrate joints	ASTM E72

	and at interface of flashing	
3. Restrained Environmental Conditioning	No cracking within the field of the panel, substrate joints and at interface of flashing	ICC-ES AC212
4. Water Penetration	No visible water penetration after Structural, Racking, Restrained Environmental Conditioning: Tested for 15 minutes at 2.86 psf	ASTM E331
Sequential Testing- Weathering		
1. UV Light Exposure		ICC-ES AC212
2. Accelerated Aging		ICC-ES AC212
3. Hydrostatic Pressure Test	No water penetration after UV exposure and accelerated aging: Tested for 5 hours with 21.7 inches of hydrostatic head	AATCC 127
Freeze-Thaw	No cracking, checking, crazing, erosion, delamination or other deleterious effects.	ICC-ES AC212 ASTM E2485 Method B
Water Resistance	No deleterious effects after 14 day exposure	ASTM D2247
Tensile Bond	Greater than 15 psi	ASTM C297

(1) Average value. Actual value may vary.

(2) Full strength of silicone not realized due to failure of fiberglass mat / sheathing substrate prior to coating failure.

(3) Samples were prepared per ASTM D2370 and tested in accordance to ASTM D412.

END OF SECTION

SECTION 07 41 00
METAL WALL PANELS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. AEP Span, West Sacramento, CA; 800-733-4955, www.aep-span.com.
2. MBCI, Atwater, CA; 800-829-9324, www.mbc.com.
3. Carlisle Metal Products, Carlisle, PA; 800-479-6832, www.carlislemetalproducts.com.
4. Metal Sales Manufacturing Corporation, Louisville, KY; 800-406-7387, www.metalsales.us.com.
5. Morin Corporation, Fontana, CA; 800-700-6140, www.morincorp.com.
6. Firestone Metal Products LLC, Anoka, MN; 800-426-7737, www.firestonemetal.com.

1.2 SIDING PANEL SYSTEM

- A. Pre-finished panels shall be fabricated of 22 gauge galvanized steel in full lengths as shown on the Drawings. Panels shall have a minimum rib depth of 7/8 inch and be minimum 12 inches wide. Individual panels shall be removable for replacement of damaged material.

1.3 SIDING PANEL MATERIALS

- A. Base metal shall be 22 gauge steel with 1.9 mil thick Zinalume protective coating conforming to ASTM A792.
- B. Flashings, trims, reveals, and all other items indicated on the Drawings shall be pre-finished to match siding panels and shall be furnished and installed hereunder. All items shall conform to ASTM A792, 22 gauge, unless indicated otherwise.
- C. Fasteners, clips, etc., shall be corrosion-resistant type as recommended by the manufacturer to provide a complete concealed anchorage system and to ensure a water and weatherproof installation.

1.4 FABRICATION

- A. Form sections to configuration indicated on the Drawings, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest practical lengths.

1.5 FINISH

A. Factory Finish:

1. Exposed Face: Dura Tech 5000 Polyvinylidene Fluoride (PVDF) paint system consisting of a baked-on 0.2 mil thick corrosion-resistant primer and a baked-on 0.8 mil thick finish coat containing 70 percent Kynar 500/Hylar 5000 resins for total coating of 1.0 mil dry film thickness. Color as selected by Architect from manufacturer's full range of colors.

2. Concealed Face: Corrosion-resistant primer coat with 0.15 mils dry film thickness and finish coat of polyester paint with 0.35 mils dry film thickness.
3. All dry film thickness measurements shall be in accordance with ASTM D1005.

1.6 SEALANTS

- A. As recommended by the manufacturer and complying with the requirements of TT-S-00230.

END OF SECTION

SECTION 07 41 13
METAL ROOF PANELS

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers:

1. AEP Span, West Sacramento, CA; 800-733-4955, www.aep-span.com.
2. MBCI, Atwater, CA; 800-829-9324, www.mbc.com.
3. Carlisle Metal Products, Carlisle, PA; 800-479-6832, www.carlislemetalproducts.com.
4. Metal Sales Manufacturing Corporation, Louisville, KY; 800-406-7387, www.metalsales.us.com.
5. Morin Corporation, Fontana, CA; 800-700-6140, www.morincorp.com.
6. Firestone Metal Products LLC, Anoka, MN; 800-426-7737, www.firestonemetal.com.

1.2 METAL ROOF PANELS

- A. Metal Standing Seam Roofing System: Pre-finished, 16 inch coverage; 2-7/8 inch tall standing seam; concealed anchors that resist wind uplift yet permits expansion and contraction with temperature changes.
- B. Base Metal: 22 gauge steel sheet, aluminum-zinc alloy coated by hot-dipped process conforming to ASTM A792/A792M and ASTM A924/A924M, minimum AZ50 coating, minimum yield strength of 40 ksi.

1.3 ACCESSORIES AND RELATED MATERIALS

- A. Fasteners, Clips, Cleats, Thermal Spacer, Flat Bearing Plate: Corrosion-resistant type as provided by manufacturer to complete a concealed anchorage system and to ensure a water and weatherproof installation. Fasten clips over flat bearing plates over rigid insulation. Exposed gutter rivets shall be finished to match roofing material.
- B. Closures: Metal or black closed cell pre-molded neoprene or polyethylene foam meeting ASTM D1056 grade SCE-41 Black EPT.
- C. Flashings, Trims, Gutters and Downspouts: Same gauge, material and finish as metal roof. Profile as shown on Drawings.
- D. Downspout Strainer: Wire strainer, same basic material as gutter.
- E. Rigid Insulation: Closed-cell polyisocyanurate foam core integrally laminated to heavy black (non-asphaltic), fiber-reinforced felt facers with square edges; conforming to ASTM C1289, Type II, Class 1; Grade 2 (20 psi minimum compressive strength); surface burning characteristics: flame spread 25 to 50 and smoke developed 50 to 170 per ASTM E84; long-term thermal resistance (LTTR) value minimum 5.5 F·hr·SqFt / Btu / inch at 75 degrees F per CAN/ULC-S770; thickness as indicated on Drawings.
 1. Acceptable Products:
 - a. ACFoam-II by Atlas Roofing Corp., Atlanta, GA; 770-952-1442, www.atlasroofing.com.

- b. Multi-Max FA-3 by Rmax, Inc., Dallas, TX; 800-527-0890, www.rmaxinc.com.
 - c. ISO 95+ by Firestone Building Products, Indianapolis, IN; 800-428-4442, www.firestonebpco.com.
 - d. or accepted equal.
- F. Gypsum Cover Board: Glass mat-faced, noncombustible, moisture-resistant treated gypsum core panel; 1/2 inch thick, square edges; conforming to ASTM C1177.
- 1. Product: DensDeck by Georgia-Pacific Gypsum LLC, Atlanta, GA; 404-652-4000, www.gp.com, or accepted equal.
- G. Premium Underlayment: Refer to Section 07 13 26.

1.4 FABRICATION

- A. Form sections to configuration indicated on Drawings, accurate in size, square and free from distortion or defects.
- B. Fabricate panel pieces in longest practicable lengths.
- C. Fabricate flashings, trim, gutters, downspouts, and accessories in longest practical lengths.

1.5 FINISH

- A. Factory Finish:
 - 1. Exposed Face: DuraTech 5000 Polyvinylidene Fluoride (PVDF) paint system consisting of a baked-on 0.2 mil thick corrosion-resistant primer and a baked-on 0.8 mil thick finish coat containing 70 percent Kynar 500/Hylar 5000 resins for total coating of 1.0 mil dry film thickness.
 - 2. Concealed Face: Corrosion-resistant primer coat with 0.15 mils dry film thickness and finish coat of polyester paint with 0.35 mils dry film thickness.
 - 3. All dry film thickness measurements shall be in accordance with ASTM D1005.
- B. Color as selected by Architect from manufacturer's full range of colors, meeting "Cool Roof" requirements.

END OF SECTION

SECTION 07 42 00

EXTERIOR SOLID PHENOLIC PANELS

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

- A. Trespa North America, Poway, CA; 800-487-3772, www.trespanorthamerica.com. Products: Trespa Meteon Uni Colours, or Metallics, or Wood Decors, or Naturals, with TS 220 mounting system (concealed fastening over variable depth aluminum sub-framing, or TS210 mounting system (concealed fastening over variable depth aluminum sub-framing) as manufactured by Elward Systems Corporation.
 - 1. ICC ES Report No. ESR-1687.
- B. Prodema North America. Product: ProdEX.
 - 1. ICC ES Report No. ESR-3439.
- C. Abet Laminati. Product: MEG.
- D. Formica Corporation. Product: Vivix.

1.2 SOLID PHENOLIC PANELS

- A. Panel Type: Solid phenolic flat panels formed with thermosetting resins, homogenously reinforced with cellulose fibers and manufactured under high pressure and temperature. Panels shall have a pigmented resin, decorative surface that is electron-beam cured for superior chemical and dirt resistance.
- B. Panel Core: Type FR fire retardant black core.
- C. Panel Sizes: As indicated on Drawings.
- D. Panel Thickness: 3/8 inch.
 - 1. Panel Weight: Three pounds per square foot.
- E. Panel Properties:
 - 1. Modulus of Elasticity: 1,300,000 psi.
 - 2. Tensile Strength: 10,100 psi.
 - 3. Flexural Strength: 14,500 psi.
 - 4. Surface Impact Resistance: 9 lbf, minimum.
 - 5. Scratch Resistance: 0.79 lbf, minimum.
 - 6. Fire-Resistance: Class A., ASTM E84.
 - 7. Water Absorption: Less than 1.0 percent.
 - 8. Porosity: Nonporous surface and edges.
 - 9. Microbial Characteristics: Will not support micro-organic growth.
 - 10. Cleanability: Resists dirt pickup; easily cleaned.
 - 11. Color Stability: 4 to 5 scale per ISO 105 A02-93.

- F. Accessories: Corner profile, trim, and framing as recommended by manufacturer and as indicated on Drawings.
 - 1. Fasteners and Fittings: Stainless steel, type and size as recommended and provided by panel manufacturer.
 - 2. Aluminum Trim: ASTM B209/B209M, finish as indicated.
 - 3. Separation Tape: As recommended by panel manufacturer, for use at dissimilar metals.

1.3 FINISH

- A. Panel Colors: As selected by Architect.
 - 1. Single-sided color with black reverse.
- B. Panel Finish: Satin sheen.

1.4 FABRICATION

- A. Fabricate solid phenolic panels and accessories in accordance with manufacturer's printed instructions, and as indicated on Drawings.
 - 1. Miter panels at corner conditions.

1.5 SUBSTRUCTURE FRAMING SYSTEM

- A. Metal Support Structure:
 - 1. Extruded aluminum support rails and fixing components. System shall be designed to allow independent hydric and thermal movement of the system components and to manage and drain any water entering the cavity behind the cladding and shall be sufficiently vented to allow the cavity to dry and if water vapor diffuses from the building interior through the exterior wall assembly, it shall be permitted to be vented and/or drained to the exterior.
 - 2. Attachment system shall be certified by panel manufacturer.
 - 3. Testing:
 - a. Air Leakage Resistance at 6.24 pounds per square foot per ASTM E283: 0.3 cubic feet per minute per square foot.
 - b. Water Penetration Resistance at 12 pounds per square foot per ASTM E331.
 - 4. Support Bracket: F1/F2 Bracket – Non-continuous bracket assembly that anchors directly to wall substrate providing and ASHRAE 90.1-2009 compliant attachment method within cladding cavity and supports L/T/Profiles.
 - 5. Fasteners: Stainless steel fasteners and anchors of type, size, and spacing required for type of substrate and Project conditions, to meet performance requirements, and as indicated in design calculations and shop drawings.
 - 6. Flatness Criteria: Maximum 1/8 inch in 15'-0" on panel in any direction for assembled units (non-accumulative).

END OF SECTION

SECTION 07 42 13
FORMED ALUMINUM PANELS

PART 1 PRODUCTS

1.1 FABRICATORS

- A. Acceptable Fabricators:
1. Royal Glass Co., Inc.
 2. Pohl USA, Inc.
 3. Sapa, Inc.

1.2 ARCHITECTURAL METAL PANEL SYSTEM

- A. Provide factory-formed, metal plate panels fabricated from single sheets of metal formed into profile for installation method indicated. Include attachment system components, panel stiffeners, and accessories required for weathertight system.

1.3 MATERIALS

- A. Select materials for surface flatness, smoothness, and freedom from surface blemishes where exposed to view in the finished system.
- B. Aluminum sheet with minimum thickness of 0.125 inch with strength and durability properties specified in ASTM B209 for 3003H-14 or 5005-H32AQ alloys.

1.4 FINISHES

- A. Fluoropolymer Three Coat Coating System: Manufacturer's standard two or three coat, thermo-cured system composed of specially formulated inhibitive primer, fluorocarbon color coat, and a clear fluorocarbon topcoat. Both color coat and clear topcoat shall contain not less than 70 percent polyvinylidene resin by weight in compliance with AAMA 2605 for testing, performance, and application procedures
1. Panels shall be chemically etched by an appropriate cleaner in accordance with manufacturer's written instructions.
 2. Apply acid resistant primer to cleaned aluminum. Thickness range; 0.20 mils to 0.30 mils.
 3. Apply polyvinylidene fluoride (PVF2) resinated color coat. Thickness range; 0.8 mils to 1.2 mils.
 - a. Kynar 500: Must be applied by certified Kynar coater.
 - b. Hylar 5000: Must be applied by certified Hylar coater.
 4. Apply clear top coat finish as extra protection, no less than 0.8 mils thick. Comply with AAMA 2605 standards.
 5. Color: Custom color as selected by Architect.
 6. Properties: Meet or exceed requirements of AAMA 2605.

1.5 ACCESSORIES

- A. Sealants within the panel system shall be as per manufacturer's standards to meet performance requirements.
- B. Internal Flashing: Sheet metal flashing which may be required at base or penetration conditions shall be produced in the same material finish as the adjacent panels but shall be provided in minimum 0.040 inch thickness.
- C. Coping: Wall copings shall be produced with the same material as the wall panel system unless otherwise noted. Sheet metal flashing extensions will be acceptable in non-viewing areas in accordance with Manufacturer's recommended details.
- D. Furring/Supports: Wall panels shall be attached to minimum 16 gauge G-90 steel studs or furring.
- E. Fasteners: Type 304 stainless steel or cadmium plated as recommended for specific application.
- F. Shims: High impact plastic shims shall be used to maintain planar surfaces.

END OF SECTION

SECTION 07 42 16
INSULATED-CORE METAL WALL PANELS

PART 1 – PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

- A. CENTRIA Architectural Systems, Moon Township, PA; 800-759-7474; www.centria.com.
Products:
1. Formawall Dimension Series wall panels.
 2. Formavue FV-400S integrated window system.
 3. Formawall Integrated Sunshades, custom cantilevered tube sunshade system number 100-3C-30, as manufactured by Construction Specialties, Inc.
- B. Kingspan Benchmark, Greenfield, Holywell, Flintshire; +44 (0)1352 716100;
www.kingspanbenchmark.com.
- C. Insulated Panel Systems, Division of NCI Building Systems, Stafford, TX; 800-729-9324;
www.insulated-panels.com.
- D. Metl-Span, A BlueScope Steel Company, Lewisville, TX; 877-585-9969;
www.metlspan.com.

1.2 WALL PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A755/A755M.
1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation; structural quality.
 2. Surface: Smooth finish.
 3. Exposed Coil-Coated Finish: Metallic fluoropolymer, AAMA 621, three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 4. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.7 mil.
 5. Panel Sealants:
 - a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, non-staining tape 1/2-inch wide and 1/8-inch thick.
 - b. Joint Sealant: ASTM C920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacturer.
 - c. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

1.3 INSULATION

- A. Provide foamed-in-place insulation core of urethane-modified isocyanurate with density of 2.7 pounds per cubic foot and minimum compressive strength of 20 pounds per square inch.
 - 1. Insulation shall have a maximum flame-spread index of 25 and smoke-developed index of 450.
 - 2. Closed-Cell Content: 90 percent when tested according to ASTM D6226.

1.4 METAL FRAMING

- A. Metal Framing, General: ASTM C645, Grade 50 cold-formed metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized.
- B. Subgirts: Manufacturer's standard C- or Z-shaped sections, 0.064-inch minimum nominal thickness.
- C. Zee Clips: 0.079-inch minimum nominal thickness.
- D. Base or Sill Angles or Channels: 0.079-inch minimum nominal thickness.
- E. Hat-Shaped, Rigid Furring Channels: As required to meet performance requirements, thickness 0.064 inch, minimum; depth as indicated.
- F. Cold-Rolled Furring Channels: As required to meet performance requirements, thickness 0.064 inch, minimum; depth as indicated; minimum 1/2-inch wide flange.
 - 1. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch diameter wire, or double strand of 0.048-inch diameter wire.
- G. Fasteners for Miscellaneous Metal Framing: Type, material, size, corrosion resistance, holding power, and other properties as required to fasten miscellaneous metal framing members to substrates.

1.5 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws; bolts and nuts; self-locking rivets and bolts; end-welded studs; and other suitable fasteners designed to withstand design loads.

1.6 FOAMED-INSULATION-CORE METAL WALL PANELS

- A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.
- B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels: Formed with tongue-and-groove panel edges with pressure-equalized horizontal joint; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.
 - 1. Facings: Fabricate panel with exterior and interior facings of same material and thickness. Provide zinc-coated (galvanized) steel sheet, 0.030-inch (22 gauge) nominal thickness.
 - 2. Panel Coverage: As indicated on Drawings.
 - 3. Panel Thickness: 2 inches.

4. Thermal-Resistance Value (R-Value): 14.
5. Finishes:
 - a. Comply with requirements of AAMA 621.
 - b. Exposed Face Finish: Three-coat, 70 percent minimum fluoropolymer resin coating system; color as indicated on Drawings.
 - 1) Primer: 0.2 mil minimum dry film thickness.
 - 2) Color Coat: 0.8 mil minimum dry film thickness.
 - 3) Clear Coat: 0.5 mil minimum dry film thickness.
 - c. Concealed Face Finish: Manufacturer's standard siliconized polyester coating.
 - 1) Primer: 0.2 mil minimum dry film thickness.
 - 2) Color Coat (Acrylic): 0.5 mil minimum dry film thickness.

1.7 ACCESSORIES

- A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material, finish, and color of metal wall panels unless otherwise indicated.
- B. Flashing and Trim: Formed from 0.018-inch minimum thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal wall panels.
- C. Panel Attachment Clips: Concealed G-90 galvanized steel clips configured to prevent overdriving of fastener and crushing of foam core, with panel fasteners engaging both face and liner elements and mechanically attaching to panel supports.

1.8 INTEGRATED WINDOW SYSTEM

- A. Thermally-improved fixed aluminum window units designed to integrate with metal wall panel profile and secondary support system without receptor channels or other flashing. Integrated window system shall be provided by metal wall panel manufacturer.
- B. Window Characteristics:
 1. Framing: Thermally-improved 6063-T5 or 6560-T5 aluminum extrusion, inside or outside glazed. Frames shall accept 1 inch thick insulated glass units as specified in Section 08 81 00.
 2. Depth: 6-5/8 inches, or 7-5/8 inches, or 8-5/8 inches.
 3. Sightlines:
 - a. Head: 2-1/2 inches.
 - b. Sill: 2-1/2 inches.
 - c. Mullions: 2-1/2 inches.
 4. Configuration Strip window.

5. Finish:
 - a. Interior: Match wall panel finish.
 - b. Exterior: Match wall panel finish.
6. Exterior pressure bar glazing with snap-on cover.
7. Internal gutter at window head and panel base.

1.9 INTEGRATED SUN SCREENS

- A. Extruded aluminum blades and outriggers, designed to integrate with insulated-core metal wall panel profile and secondary support system, with gasketed cast aluminum fitting connecting outrigger to through-tube structural supports without flashing and without penetration of wall panel interior vapor seal.
 1. Configuration: As indicated on Drawings.
 2. Outrigger Type: As indicated on Drawings.
 3. Finish and Color: Match metal wall panel finish and color.

1.10 FABRICATION

- A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Horizontal Joints: Horizontal joints with positive drip edge, sloped drain shelf and integral venting to the exterior along the panel length to permit moisture drainage and to allow air to enter the pressure equalization chamber. Joint shall have a 2-3/8-inch baffle interlock to provide effective rain screen and pressure equalized performance as demonstrated by testing specified Part 1 of this Section.
- E. Vertical Joints: Vertical joints for insulated metal panels shall be gasketed, exposed wet seals are not permitted. Outer wings of gasket shall compress against the metal return flange (trimless end) of the panel face. Include an integrated, insulated metal vertical joint spline. The insulated vertical reveal shall be recessed 1-3/16 inches deep and be 5/8 inch wide. The insulated metal vertical joint shall not add exterior sightlines, expose metal edges or exposed wet seals. The joint spline shall include polyisocyanurate foam insulation adhered to a metal face of the same material and gauge as the face of the panel. The vertical joint shall be designed to allow moisture to be drained from the panel's horizontal joint. No end dam sealant shall be applied to the ends of the horizontal joint at the vertical joint location. A continuous back-up flash behind the vertical joint is required with two beads of field applied non-curing butyl sealant between the panel and back up flashing for each panel.
- F. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1.11 FINISH, GENERAL REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of accepted 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 accepted samples and are assembled or installed to minimize contrast.

END OF SECTION

SECTION 07 42 43.16

ALUMINUM COMPOSITE WALL PANELS

PART 1 PRODUCTS

1.1 PRODUCTS AND MANUFACTURERS

A. Acceptable Products and Manufacturers:

1. Alucobond Plus by 3A Composites USA Inc., Benton, KY; 800-626-3365
www.alucobond.com.
2. Reynobond ACM by Alcoa Cladding Systems, Norcross, GA; 770-840-6456,
www.alcoacladdingsystems.com.
3. Alpolic by Mitsubishi Plastics Composites America, Inc., Chesapeake, VA; 800-422-7270
www.alpolic-americas.com.

1.2 COMPOSITE METAL PANELS

A. Materials:

1. Two sheets of aluminum face sheets sandwiching a solid core of thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials.
2. Face Sheets: Aluminum 3105-H14 alloy; minimum 0.0197 inch thick.
3. Core: Thermoplastic material, free of voids or air spaces and shall not contain foamed insulation material.

B. Properties:

1. System:
 - a. Rout and return dry seal (rainscreen); reveal joint as shown on drawings, sealant as specified in Section 07 92 00 and with foam type backer rod.
 - b. System shall not have any visible fasteners, telegraphing, or fastening on the panel faces or any other compromise of a neat and flat appearance.
 - c. System shall be designed so that no restraints can be placed on the panel which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight in accordance with performance requirements as specified in this Section.
 - d. Outside corners shall be back-routed and shop bent.
2. Panel thickness and weight: 0.157 inch (4 mm), 1.12 pounds per square foot.
3. Fire Resistance: CBC Class A.
 - a. Flame spread: 0 per ASTM E84.
 - b. Smoke developed: 10 maximum per ASTM E84.
4. Bond Integrity:
 - a. Bond strength: 1,500 psi minimum per ASTM C297.
 - b. Peel strength: 33.6 in-lb/in minimum per ASTM D1781.

- c. No change in bond performance after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.

1.3 ACCESSORIES

- A. Provide manufacturer's standard accessories including fasteners, clips, anchorage devices and attachments.
- B. Sealant: Refer to Section 07 92 00.

1.4 FABRICATION

- A. Fabricate panels to sizes and joint configurations indicated on approved shop drawings. Where final dimensions cannot be established by field measurements, provide allowance for field adjustment as recommended by manufacturer.
- B. Form panel lines, breaks, and angles sharp and true, with surfaces free from warp or buckle.
- C. Fabricate with sharp edges, with no displacement of aluminum sheet or protrusion of core.
- D. Fabricate panels with removable protective film.
- E. Fabrication Tolerances:
 - 1. Width: Plus 0.08 inch.
 - 2. Length: Plus 0.22 inch.
 - 3. Thickness: Plus 0.008 inch.
 - 4. Bow: Maximum 0.5 percent of length or width.
 - 5. Squareness: 0.2 inch.
 - 6. Edges of sheets shall be square and trimmed with no displacement of aluminum sheets or protrusion of core material.

1.5 FINISH

- A. Finish: Coil-coated; 70 percent Polyvinylidene Fluoride (PVDF) in accordance with AAMA 2605; color as selected by Architect.

END OF SECTION

SECTION 07 44 63
FABRICATED FACED PANEL ASSEMBLIES

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Products and Manufacturers:

1. GlazeGuard 1000 WR+ by Citadel Architectural Products, Inc., Indianapolis, IN; 800-446-8828, www.citadelap.com.
2. Mapes R by Mapes Panels, LLC; 800-228-2391, www.mapes.com.
3. Omega Foam-Ply by Laminators, Inc., Hatfield, PA; 877-663-4277, www.laminatorsinc.com.

1.2 PANELS

A. Laminated metal faced panels with insulating substrate and core.

B. Composition:

1. Face Sheets: Smooth aluminum, minimum thickness 0.024 inch.
2. Substrate: Corrugated high density polyethylene (HDPE).
3. Core: Polyisocyanurate foam.

C. Properties:

1. Thickness: 1 inch.
2. Thermal Resistance (R-value): 8.23 minimum.
3. Fire Resistance: CBC Class A.
 - a. Flame Spread (ASTM E84): 0.
 - b. Smoke Developed (ASTM E84): 10 maximum.

1.3 FABRICATION TOLERANCE

- A. Thickness: Plus or minus 1/16 inch.
- B. Length and Width: 0.8 percent of dimension.

1.4 FINISH

- A. 70 percent Polyvinylidene Fluoride (PVDF), Kynar 500 or Hylar 5000 paint system, conforming to AAMA 2605.
- B. Color as selected by Architect.

END OF SECTION

SECTION 07 51 00
BUILT-UP BITUMINOUS ROOFING

PART 1 PRODUCTS

1.1 MANUFACTURERS – SHEET AND BITUMEN MATERIALS

A. Basis-of-Design Product and Manufacturer: 4GIC-CR system by Johns Manville Roofing, Denver, CO; 303-978-2000, www.jm.com. Provide the named product or accepted equal by one of the following:

1. GAF Materials Corporation, Wayne, NJ; 877-423-7663, www.gaf.com.
2. CertainTeed Corporation, Valley Forge, PA; 800-233-8990, www.certainteed.com.

1.2 SHEET MATERIALS

A. Glass Fiber Felts: Type IV.

B. Mineral Surfaced Felts: ASTM D3909; white colored ceramic granules with white acrylic coating.

1. Reflectivity: 0.76.
2. Emissivity: 0.85.
3. SRI: 93.

1.3 BITUMINOUS MATERIALS

A. Asphalt Bitumen: ASTM D312, Type III.

B. Asphalt Primer: ASTM D41.

C. Plastic Cement: ASTM D4586, Type II.

D. MBR Utility Cement.

1.4 FLEXIBLE FLASHINGS

A. Sheet Flashing: ASTM D6221, Type I, polyester/glass scrim reinforced, SBS modified bitumen sheet. Color: White.

1.5 CANTS

A. Fiber Cant and Tapered Edge Strips: High-density board made of high strength fibers and expanded perlite, preformed to 45 degree angle. Fiber cants and tapered edge strips shall be mechanically fastened to the roof deck.

1.6 INSULATION

A. Polyisocyanurate tapered insulation system in conformance with ASTM C1289, Type II, Class 1, Grade 2, as provided by roof system manufacturer, with the following characteristics:

1. Board Size: Manufacturer's standard.
2. LTTR: 6.0 per inch minimum.

3. Board Edges: Square.
4. Compressive Strength (ASTM D1621): 20 psi minimum.
5. Slope: As indicated on Drawings.

B. Place insulation over entire area scheduled to receive built-up roofing to provide positive drainage to roof drains.

C. All crickets shall be constructed of the insulation material specified above.

1.7 COVER BOARD

A. 1/2 inch high-density board provided by roof system manufacturer in conformance with ASTM C728 consisting of expanded perlite and cellulosic fibers with a top coating to ensure attachment of subsequent roofing system.

1.8 GYPSUM COVER BOARD

A. Glass mat-faced, noncombustible, moisture-resistant treated gypsum core panel, 5/8 inch thick, square edges, conforming to ASTM C1177, Type X.

1. Where membrane is attached to gypsum cover board with adhesive (such as at vertical surfaces), cover board shall be factory primed and 5/8 inch thick. Do not use products intended for use as exterior wall sheathing.

1.9 ACCESSORIES

A. Roofing Nails: Galvanized or nonferrous type, size as required to suit application.

B. Traffic Pads: Asphalt impregnated mineral boards with granular surfaces: 32 inches x 32 inches x 5/16 inch size.

END OF SECTION

SECTION 07 52 00

MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 PRODUCTS

1.1 PRODUCTS AND MANUFACTURERS – MEMBRANE MATERIALS

- A. Basis-of-Design Product: Derbigum Americas, Inc., Kansas City, MO; 800-727-9872, www.derbigum.us.
- B. Johns Manville Roofing, Denver, CO; 303-978-2000, www.jm.com.
- C. Siplast, Irving, TX; 800-922-8800, www.siplast.com.

1.2 MEMBRANE MATERIAL

- A. Membrane: Derbicolor XPS FR CR fire resistant membrane consisting of atactic polypropylene (APP) modified select asphalt, a non-woven glass fiber mat and a glass fiber and polyester scrim composite; surfaced with factory applied highly reflective granule surface, white color:
 - 1. Thickness: 180 mils.
 - 2. Sheet Width: 39-3/8 inches.
 - 3. Tensile Strength: 200 psi minimum per ASTM D2523.
 - 4. Reflectivity: 0.74 per ASTM C1549.
 - 5. Emissivity: 0.93 per ASTM E1371.
 - 6. Solar Reflective Index: 92 per ASTM E1980.

1.3 SHEET MATERIALS

- A. Base Sheet: PRS modified base sheet consisting of an SBS base ply reinforced with a non-woven glass fiber mat meeting or exceeding ASTM D4601 Type II specifications.

1.4 BITUMINOUS MATERIALS

- A. Cold-Applied Roofing Adhesive: Permastic consisting of a one-part thixotropic asphalt based adhesive with over 80 percent solids content.

1.5 FLASHINGS

- A. Flexible Flashings: Same material and color membrane.
- B. Counter Flashings: Galvanized metal as specified in Section 07 62 00.

1.6 INSULATION

- A. AC Foam—II and Tapered AC Foam polyisocyanurate insulation systems as manufactured by Atlas Roofing Corporation, Dow, RMAX or accepted equal with the following characteristics:
 - 1. Board Size: Manufacturer's standard.
 - 2. LTTR: 5.5 per inch, minimum.

3. Board Edges: Square.
4. Compressive Property (ASTM D1621): 25 psi minimum.
5. Slope: As indicated on Drawings.
6. Type II, Class 1 per ASTM C1289.
7. Location, slopes and thickness of insulation: Refer to Drawings.
8. All new crickets shall be constructed of the same materials listed in this paragraph.

1.7 UNDERLAYMENT BOARD

- A. Fiberglass-Faced Gypsum Roof Board: Dens-Deck Prime, 5/8-inch thickness in compliance with ASTM C1177/C1177M, as manufactured by Georgia Pacific or accepted equal.

1.8 ACCESSORIES

- A. Fiber Cant and Tapered Edge Strips: Asphalt impregnated wood fiberboard, preformed to 45 degree angle.
- B. Fasteners: Perlok Assembled screws and steel plates as recommended by roofing manufacturer.
- C. Sealants: As recommended by membrane manufacturer.

END OF SECTION

SECTION 07 54 19
POLYVINYL-CHLORIDE ROOFING

PART 1 PRODUCTS

1.1 PRODUCTS AND MANUFACTURERS – MEMBRANE MATERIAL

- A. Basis-of-Design Product: Sarnafil10G410-15, 60 mil thermoplastic membrane with fiberglass reinforcement by Sika Sarnafil, Canton, MA; 800-451-2504, www.sarnafilus.com. Provide the named product or accepted equal by one of the following:
1. Johns Manville Roofing, Denver, CO; 303-978-2000, www.jm.com.
 2. GAF Materials Corporation, Wayne, NJ; 877-423-7663, www.gaf.com.

1.2 GENERAL

- A. Components to be used that are other than those supplied or manufactured by roofing manufacturer may be submitted for review and acceptance by roofing manufacturer. Roofing manufacturer's acceptance of any other product is only for a determination of compatibility with roofing manufacturer's products and not for inclusion in the roofing manufacturer's warranty. The specifications, installation instructions, limitations, and restrictions of the respective manufacturers shall be reviewed by the Architect for acceptability for the intended use with the basis-of-design products.

1.3 MEMBRANE

- A. Membrane shall conform to ASTM D4434. Classification: Type II, Grade I.
1. Sarnafil 10G410-15, 60 mil thermoplastic membrane with fiberglass reinforcement and lacquer coating.
- B. Certified Polymer Thickness:
1. Membrane manufacturer is to certify that the polymer thickness is of the polymer thickness specified. Certification is to be signed by the membrane manufacturer's quality control manager. ASTM +/- tolerance for membrane thickness is not acceptable.
- C. Color of Membrane:
1. EnergySmart White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 (ENERGY STAR listed).

D. Typical Physical Properties:

Parameters	ASTM Test Method	ASTM D-4434 Spec. Requirement	Typical Physical Properties
Reinforcing Material	-	-	Fiberglass
Overall Thickness (1), min., inches	D638	0.045	0.060
Thickness Above Scrim	-	-	0.023 (avg.)
Tensile Strength, min., psi	D638	1500	1600
Elongation at Break, min. (machine / transverse)	D638	250% / 220%	250% / 220%
Seam strength (2), min. (percent of tensile strength)	D638	75	80
Retention of Properties After Heat Aging	D3045	-	-
Tensile Strength, min., (percent of original)	D638	90	95
Elongation, min., (% of original)	D638	90	90
Tearing Resistance, min., lbf	D1004	10	14
Low Temperature Bend, -40° F	D2136	Pass	Pass
Accelerated Weathering Test (florescent light, uv exposure)	G154	5,000 Hours	10,000 Hours
Cracking (7x magnification)	-	None	None
Discoloration (by observation)	-	Negligible	Negligible
Crazing (7x magnification)	-	None	None
Linear Dimensional Change	D1204	0.10% max.	0.02%
Weight Change After Immersion in Water	D570	± 3.0% max.	2.5%
Static Puncture Resistance, 33 lbf	D5602	Pass	Pass
Dynamic Puncture Resistance, 7.3 ft-lbf	D5635	Pass	Pass
Initial Solar Reflectance		-	0.83
Emissivity	E408, C1371, Other	-	0.90
Solar Reflective Index (SRI)	E1980	-	104
Recycled Content (5 foot and 10 foot sheets only)		8 percent to 12 percent Pre-Consumer / Up to 1 percent Post Consumer.	

1.4 FLASHING MATERIALS

A. Wall/Curb Flashing:

1. Sarnaclad: A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad shall be 24 gauge, G90 galvanized metal sheet with a 20 mil unsupported Sarnafil membrane laminated on one side.

B. Perimeter Edge Flashing:

1. Sarnaclad: A PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 24 gauge, G90 galvanized metal sheet with a 20 mil unsupported Sarnafil membrane laminated on one side.
2. Non-Typical Edge: Project-specific perimeter edge detail reviewed and accepted for one-time use by Sika Sarnafil's Technical Department. Consult Regional Technical Manager prior to job start for review and consideration for acceptance.

C. Miscellaneous Flashing:

1. Sarnaflash: A prefabricated expansion joint cover made from Sarnafil membrane. Sarnaflash is designed for securement to vertical or horizontal surfaces to span and accommodate the movement of new and existing expansion gaps from 1 inch to 4-1/2 inches across.
2. Sarnastack: A prefabricated vent pipe flashing made from 0.048 inch thick Sarnafil G410 membrane.
3. Sarnacircle-"G": Circular 0.048 inch thick G410 membrane patch welded over T-joints formed by overlapping thick membranes.
4. Sarnacorners – Universal: Prefabricated outside and inside flashing corners made of 0.060 inch thick membrane that are heat-welded to membrane or Sarnaclad base flashings. Available in one size which accommodate both inside and outside corners. Can be cut into one inside or one outside corner. Consult Product Data Sheet for additional information.
5. Open Post Flashing: Prefabricated post flashing, 0.048 inch thick, with an open seam used to flash obstructed rooftop conduits and pipes 1/2 to 1-1/4 inches in diameter. Available in two sizes; 1/2 to 3/4 inch and 3/4 to 1-1/4 inch diameter. Open Post Flashings shall be heat welded in place and terminated at the top of the penetration completing the pipe penetration detail.
6. Sikaflex-1a Sealant: A proprietary sealant used at flashing terminations. Consult Product Data Sheet for additional information.
7. Sarnacol 2170 VC Adhesive: A solvent-based, low VOC, reactivating adhesive used to attach membrane to flashing substrate.
8. Sarnafelt: A non-woven polyester or polypropylene mat cushion layer that is necessary behind G410 Flashing Membrane when the flashing substrates are rough or incompatible with the flashing membrane.

1.5 INSULATION/OVERLAYMENT/RECOVER BOARD

- A. Sarnatherm - Atlas ACFoam-III: A rigid, tapered isocyanurate foam insulation composed of a closed cell polyisocyanurate foam core laminated to a heavy, durable and dimensionally stable coated glass facer. Use this material at crickets.
- B. DensDeck Prime - Georgia Pacific: A fire-tested, 5/8 inch thick gypsum hardboard with glass-mat facers and a pre-primed surface on one side. Install on vertical surfaces where indicated on Drawings.

1.6 ATTACHMENT COMPONENTS

A. Membrane Adhesive:

1. Sarnacol 2170 VC Adhesive: A solvent-based, low VOC, reactivating adhesive used to attach the membrane to the substrate, either horizontally or vertically. Application rates are as follows:

SARNACOL 2170 VC APPLICATION RATES FOR BARE BACK MEMBRANE						
	Adhesive Rates – Gallons per 100 Square Feet					Approximate Sq. Ft./Pail
	Substrate		Membrane		Total	
Isocyanurate Paper Facer	1.25	+	0.50	=	1.75	285
Smooth Plywood	1.00	+	0.50	=	1.50	333
Metal	0.75	+	0.50	=	1.25	400
Concrete	1.25	+	0.50	=	1.75	285
GP DensDeck Prime	1.00	+	0.50	=	1.50	333

SARNACOL 2170 VC APPLICATION RATES FOR MEMBRANE FLASHINGS USING SARNAFELT							
	Adhesive Rates – Gallons per 100 Square Feet					Approximate Sq. Ft./Pail	
	Substrate (1 st coat)		Substrate (2 nd coat)		Membrane		Total
Smooth Plywood	1.00	+	1.00	+	0.50	= 2.50	200
Concrete	1.00	+	1.00	+	0.50	= 2.50	200

- a) Due to an increase in viscosity when outdoor temperatures during installation are below 40 degrees F, add 1/2 gallon per 100 square feet to rate for estimating purposes. Do not install when air temperature is within 5 degree F of dew point. Solvent evaporation time increases significantly when temperatures drop. Ensure first layer of Sarnacol 2170 VC is fully dry before second layer is applied to the back of the membrane for proper reactivation.
- b) Use a water-filled, foam-covered lawn roller to consistently and evenly press the membrane into the adhesive layer.

2. Sarnacol 2166 Adhesive: A one part, moisture curing, urethane adhesive used to attach Sarnafil membrane to approved insulation boards. Adhesive is applied using an adhesive cart. Application rate is as follows:
 - a. Coverage - Approximately one gallon per 200 to 250 square feet. Rates are based on an application pattern of 1/8 to 3/16 inch beads, 3 inches on center. Additional adhesive may be required for rougher surfaces.
 - 1) There is a significant drying time change due to an increase in humidity or a decrease in temperature. Do not install when outdoor or substrate temperatures during drying period are expected to fall below 40 degrees F.
 - 2) Do not allow adhesive to skin-over or surface-dry prior to installation of membrane.
 - 3) Use a water-filled, foam-covered lawn roller to consistently and evenly press the membrane into the adhesive layer.
 - 4) Minimum product temperature should be 50 degrees F.
 - 5) Store between 50 degrees F and 80 degrees F.
 - 6) Adhesive shall not be used during inclement weather.
 - 7) Adhesive shall not be applied to wet surfaces.

B. Insulation Board Adhesive:

1. Sarnacol 2163 Adhesive: A low odor, VOC compliant, one step, low-rise urethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a gravity fed applicator or by hand with a dual component caulk gun. Additional adhesive may be required for rougher surfaces. Application rate is as follows:
 - a. Coverage: Approximately 600 square feet per case. Rates are based on an application pattern of four ribbons, 1/4 to 1/2 inch beads, 12 inches on center per four foot x four foot insulation board. Coverage rates may vary over irregular surfaces.
 - 1) Not recommended for use with insulation boards larger than four feet x four feet.
 - 2) Place insulation board into the adhesive shortly after it has reached its maximum rise (typically within 30 seconds to 45 seconds at 60 degrees F to 80 degrees F) and walk into place.
 - 3) Minimum product temperature before entering the dispenser shall be 70 degrees F.
 - 4) Store between 60 degrees F and 80 degrees F.
 - 5) Adhesive shall not be used during inclement weather.
 - 6) Adhesive shall not be applied to wet or damp surfaces.
 - 7) A minimum of one Sarnabar placed four feet from the roof edge and fastened 12 inches on center to the structural deck with acceptable fasteners is required after installation of the Sarnafil roof membrane. The Sarnabar shall have a cover strip hot air welded over it.

1.7 WALKWAY PROTECTION

- A. Sarnatred: A polyester reinforced, 0.096 inch, weldable membrane with surface embossment. Used as a protection layer from rooftop traffic. Sarnatred is supplied in rolls of 39.3 inches wide and 32.8 feet long.

1.8 MISCELLANEOUS ACCESSORIES

- A. Sealing Tape Strip: Compressible foam with pressure-sensitive adhesive on one side. Used with metal flashings as a preventive measure against air and wind blown moisture entry.
- B. Multi-Purpose Tape: A high performance sealant tape used with metal flashings as a preventive measure against air and wind blown moisture entry.
- C. Sarnasolv: A high quality solvent cleaner used for the general cleaning of residual asphalt, scuff marks, etc., from the membrane surface. Sarnasolv is also used daily to clean seam areas prior to hot-air welding in tear off or dirty conditions or if the membrane is not welded the same day it is unrolled.

1.9 SEALANTS

- A. Sarnafil Sikaflex-1a Sealant (for termination details).
- B. Depending on substrates, the following sealants are options for temporary overnight tie-ins:
 - 1. Sarnafiller.
 - 2. Multiple layers of roofing cement and felt.
 - 3. Spray-applied, water-resistant urethane foam.
 - 4. Mechanical attachment with rigid bars and compressed sealant.

END OF SECTION

SECTION 07 54 23
THERMOPLASTIC-POLYOLEFIN ROOFING

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers and Products:

1. TPO Roofing Membrane System:
 - a. Carlisle Syntec Inc. Product: Sure-Weld 60.
 - b. Firestone Building Products Co. Product: UltraPly TPO 60.
 - c. GAF Materials Corp. Product: EverGuard TPO 60.
 - d. Johns Manville. Product: JM TPO Roofing Membrane - 60 mil.
2. Gypsum Cover Board: Provided by roof system manufacturer.
3. Roof Insulation: Provided by roof system manufacturer.

1.2 TPO ROOFING MEMBRANE

A. Ultraviolet resistant thermoplastic polyolefin membrane reinforced with polyester fabric.

B. Properties:

1. Thickness (ASTM D751): 60 mils nominal.
2. Thickness over scrim: 15 mils nominal.
3. Tolerance on nominal thickness: ± 10 percent.
4. Minimum breaking strength (ASTM D751): 320 lbf/in.
5. Elongation at break of fabric (ASTM D751): 28 percent.
6. Tearing strength (ASTM D5884): 86 lbf.
7. Dimensional stability (ASTM D1204): ± 1 percent.
8. Water absorption (ASTM D471): ± 1 percent.
9. Colors:
 - a. White.
 - 1) Initial Solar Reflectance: 0.79.
 - 2) Initial Thermal Emittance: 0.90.
 - 3) Solar Reflectance Index: 99.

1.3 GYPSUM ROOF COVER BOARD

A. Glass mat-faced, noncombustible, moisture-resistant treated gypsum core panel specifically designed for roofing applications, 1/2 inch thick, square edges, factory primed, conforming to ASTM C1177

1. Where membrane is attached to gypsum roof cover board with adhesive (such as at vertical surfaces), cover board shall be factory primed and 5/8 inch thick. Do not use products intended for use as exterior wall sheathing.

1.4 ROOF INSULATION

- A. Rigid, closed-cell polyisocyanurate foam core integrally laminated to heavy black (non-asphaltic), fiber-reinforced felt facers; square edges. Comply with ASTM C1289, Type II, Class 1, Grade 2; ICC ES Listed; UL Listed.
 - 1. Properties:
 - a. Compressive strength (ASTM D1621): 20 psi minimum.
 - b. Product density (ASTM D1621): 2.0 pounds per cubic foot minimum.
 - c. Water absorption (ASTM C209): Less than 1 percent by volume.
 - d. Surface burning characteristics (ASTM E84):
 - 1) Flame spread: Less than 75.
 - 2) Smoke developed: Less than 450.
 - e. Long-term thermal resistance (LTTR) value (CAN/ULC-S770): Minimum 6.0 F·hr·SqFt / Btu / inch at 75 degrees F.
 - f. Water vapor permeance (ASTM E96): 1.0 perms maximum.
 - g. Dimensional stability (ASTM D2126): 2.0 percent linear change maximum.
 - B. Place insulation over entire area scheduled to receive single ply roofing.
 - 1. Crickets shall be fabricated from polyisocyanurate insulation; tapered.
 - C. Insulation shall be tapered where indicated on Drawings.

1.5 ACCESSORIES

- A. Non-Reinforced or Reinforced TPO Flashing, Pipe Boot and Flashings, Clamping Rings: Use roofing membrane provided and recommended by manufacturer.
- B. Flashing Metal: 0.023 inch thick galvanized steel laminated to 0.020 inch thick roofing membrane in white color used for flashing and edge metal detailing as furnished by the membrane manufacturer.
- C. Membrane Fasteners and Disks: Use mechanical fasteners and disks approved by roofing system manufacturer and cover board and insulation manufacturers.
- D. Membrane Bonding Adhesive: Manufacturer approved two-component, low-rise, low VOC bonding adhesive to meet California Air Resources Board or local Air Pollution Control/Air Quality Management District regulations.
- E. Adhesive for Insulation and Gypsum Roof Cover Board Attachment for Adhered Single-Ply Roofing System: Two-component, low-rise adhesive approved by roofing system manufacturer and cover board and insulation manufacturers.
- F. Termination Bar: Extruded Aluminum bar 0.08 inch thick by 1 inch wide.
- G. Membrane Cleaning Solution: Manufacturer approved or recommended.

- H. Air and Vapor Barrier: Roofing manufacturer's 40 mil composite air and vapor barrier consisting of 35 mils of self-adhering rubberized asphalt laminated to a 5 mil polyolefin film with a siliconized one piece release liner. Permeability: 0.05 perms per ASTM D1970.
 - 1. Primer: Type as manufactured and recommended by roofing manufacturer, appropriate to substrate.
- I. Sealants: Refer to Section 07 92 00. Solvent-based ethylene propylene seam caulk approved by roofing system manufacturer.
- J. All-Purpose Sealant: Single component, high-solids content, and gun grade, approved by membrane manufacturer.
- K. Walkway Rolls: 34 inches wide, 180 mils thick heat-weldable TPO material as supplied by membrane manufacturer, color: white. Verify manufacturer's standards for walkway pad design and slip-resistance with Architect prior to procurement of pads and prior to submittal of shop drawings.
- L. Safety Zone Markings: Roofing manufacturer's 12 inch wide yellow coverstrip consisting of 30 mil thick non-reinforced TPO flashing laminated to a nominal 30 mil thick, fully cured synthetic rubber pressure sensitive adhesive.
- M. Wood Nailers: Pressure treated.

END OF SECTION

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

PART 2 PRODUCTS

2.1 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, G90; 24 gauge core steel, unless noted otherwise on Drawings.

2.2 ACCESSORIES

- A. Fasteners: Galvanized steel or stainless steel with soft neoprene washers. Finish exposed fasteners same as flashing metal.
- B. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187.
- C. Touch-up Paint: "Galvalloy" or "Galweldalloy."
- D. Sealant: Type specified in Section 07 92 00.
- E. Bedding Compound: Rubber-asphalt type.
- F. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.
- G. Solder:
 - 1. Galvanized Steel: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead with maximum lead content of 0.2 percent.
- H. Flux: Type as recommended by sheet metal manufacturer.
- I. Strainers: Provide and install strainers at downspout openings in gutters per SMACNA manual.

2.3 PREMANUFACTURED COPINGS

- A. Manufacturers:
 - 1. W.P. Hickman Company.
 - 2. Tremco.
 - 3. Metal Era.
 - 4. Permatite.
- B. Copings: Modular Coping System.
 - 1. Coping shall be 0.050 inch thick aluminum with smooth surface.
 - 2. Sizes as required to accommodate varying wall thicknesses.
 - 3. Splice joints shall have 6 inch long concealed splice plates at 12 feet on center. Allow 1/4 inch at all butt joints per 12 foot length.

4. Prefabricated corners shall be shop mitered and shop welded.
5. All fasteners shall be concealed.
6. Finish: Pre-finished with Kynar 500 three coat paint system in conformance with AAMA 2605, color as selected by Architect.

2.4 PREMANUFACTURED ROOF PENETRATION FLASHINGS

A. At single ply membrane roofing:

1. Pipe Portal System as manufactured by Portals Plus or accepted equal. Products:
 - a. Pipe Boots: Compression molded EPDM rubber caps mechanically sealed to curb cover using two beads formed into the collar of the cover mated with double grooves molded into the inside of the cap. Provide manufacturer's standard adapter rings as required for a watertight installation. Size and type: As required for size and number of pipes to be flashed.
 - 1) Provide stainless steel clamps for final securement of pipe boots around penetrations.

2.5 REGLETS

A. Manufacturers:

1. Fry. Products:
 - a. Plaster Flashing System: Fry Reglet Model "STX" Springlok Stucco Reglet and Counter Flashing. Material shall be 0.025 inch thick aluminum with mill finish.
 - b. Masonry Flashing System: Fry Reglet Model "MA" Springlok Masonry Reglet and Counter Flashing. Material shall be 0.025 inch thick aluminum with gray polyester coating.
 - c. Surface Mounted Flashing System: Fry Reglet Model "SM" Surface Mounted Reglet and Counter Flashing. Material shall be 0.025 inch thick aluminum with mill finish.
2. MM Systems.
3. Superior.

2.6 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.
- C. Form pieces in longest practical lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seam.
- F. Solder and seal non-moving metal joints watertight. After soldering, remove flux. Wipe and wash solder joints clean.
- G. Fabricate one piece corners with minimum 18 inch long legs; seam for rigidity, solder joint watertight.
- H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

- I. Expansion-contraction of sheet metal runs: Provide flat, 4 inch lap joints, sealed watertight with sealant, at maximum of 40 foot intervals.

2.7 FINISHES

- A. Back-paint concealed metal surfaces with bituminous paint to a minimum dry film thickness of 15 mils.
- B. Site paint finish under provisions of Section 09 91 00.

END OF SECTION

SECTION 07 71 23

MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 PRODUCTS

1.1 MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, Grade A, G90 zinc coating; 24 gauge core steel, shop prefinished.

1.2 COMPONENTS

- A. Gutters: SMACNA, profile as shown on Drawings.
- B. Downspouts: SMACNA rectangular profile. All downspout and rain water leader bends shall not exceed a 60 degree angle.
- C. Accessories: Profiled to suit gutters and downspouts.
- D. Splash Pads or Blocks: Precast concrete type, of sizes and profiles indicated; minimum 3,000 psi at 28 days, with minimum five percent air entrainment.

1.3 ACCESSORIES

- A. Anchorage Devices: Per SMACNA requirements.
- B. Gutter Supports: Galvanized steel straps.
- C. Downspout Supports: Galvanized steel brackets.
- D. Fasteners: Galvanized steel or stainless steel. Finish exposed fasteners same as flashing metal.
- E. Primer: Galvanized type.
- F. Protective Back Coating: ASTM D1187, bituminous.
- G. Solder: ASTM B32; 95/S tin-antimony type.
- H. Flux: As recommended by sheet metal manufacturer.
- I. Sealant: Type as specified under Section 07 92 00.
- J. Downspout Nozzle: Smith Model No. 1770.
- K. Scupper Drain: Smith Model No. 1520 with Model No. 1530 Loose Set Grate.

1.4 FABRICATION

- A. Form gutters and downspouts of profiles and sizes indicated to SMACNA requirements.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

- D. Hem exposed edges of metal.
- E. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints.
- F. Fabricate gutter and downspout accessories; seal watertight.

1.5 FINISHES

- A. Kynar 500 fluoropolymer paint system to match finish specified under Section 07 41 13. Colors as selected by Architect.
- B. Apply bituminous protective backing on surfaces in contact with dissimilar materials.

END OF SECTION

SECTION 07 72 13
MANUFACTURED CURBS

PART 1 PRODUCTS

1.1 MANUFACTURER

A. Thybar Corporation. Products:

1. Model No. TC-3 prefabricated insulated roof curb.
2. Model No. TEMS-3 prefabricated roof curb.
3. Model No. TCC-5 pipe penetration system.

1.2 FABRICATION

- A. Curbs shall be constructed using minimum 16 gauge ASTM A653/653M G90 galvanized steel with mitered and continuously welded corners, integral base plates, internally reinforced with 1 inch x 1 inch x 1/8 inch steel angles, and factory installed pressure treated wood nailers. All seams shall be joined by continuous water and air tight welds.
1. Insulated Curbs: Insulation shall be factory insulated with 1-1/2 inch thick, three pound density fiberglass antimicrobial rigid insulation
- B. Minimum height of curb above roofing surface shall be 8 inches unless otherwise noted on Drawings.
- C. Curbs shall be constructed to match slope of roof and provide a level top surface for mounting of equipment.
- D. Curb platforms shall be manufactured to accommodate the mounting of all equipment, penetrations and other items as required to mount and weatherproof all equipment.

END OF SECTION

SECTION 07 72 33

ROOF HATCHES

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Bilco, Products:
 - 1. Roof Hatches:
 - a. Type S-50 single leaf, or.
 - b. Type F-50 single leaf.
 - 2. Roof Hatch Guards:
 - a. Model RL-S.
 - b. Model RL-F.
 - 3. Ladder Safety Posts: Model LU-1, Ladder up.
- B. Babcock - Davis.
- C. Milcor.
- D. Lane-Aire Manufacturing Corporation.

1.2 ROOF HATCHES

- A. Unit: 30 inches by 36 inches size, single leaf type.
 - 1. Performance Characteristics:
 - a. Cover shall be reinforced to support a minimum live load of 40 pounds per square foot with a maximum deflection of 1/150th of the span and 140 pounds per square foot wind uplift.
 - b. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 - c. Operation of the cover shall not be affected by temperature.
 - d. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.
 - 2. Cover: 11 gauge aluminum with a 3 inch beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
 - 3. Cover Insulation: Fiberglass of 1 inch thickness, fully covered and protected by an 18 gauge aluminum liner.
 - 4. Curb: 12 inches in height and of 11 gauge aluminum. The curb shall be formed with a 3-1/2 inch wide flange with 7/16 inch diameter holes provided for securing to the roof deck. Curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, with flashing system, including stamped tabs, 6 inches on center, bent inward.
 - 5. Curb Insulation: Rigid, high-density fiberboard of 1 inch thickness on outside of curb.

6. Lifting Mechanisms: Provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.
 7. Hardware:
 - a. Heavy pintle hinges.
 - b. Cover shall be equipped with a spring latch with interior and exterior turn handles.
 - c. Roof hatch shall be equipped with interior and exterior padlock hasps.
 - d. The latch strike shall be a stamped component bolted to the curb assembly.
 - e. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1 inch diameter red vinyl grip handle to permit easy release for closing.
 - f. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be Type 316 stainless steel.
 - g. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
 8. Finish: Factory finish shall be mill finish aluminum.
- B. Unit: 48 inches by 48 inches size, single leaf type.
1. Performance Characteristics:
 - a. Cover shall be reinforced to support a minimum live load of 40 pounds per square foot with a maximum deflection of 1/150th of the span and 20 pounds per square foot wind uplift.
 - b. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 - c. Operation of the cover shall not be affected by temperature.
 - d. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.
 2. Cover: 11 gauge aluminum with a 3 inch beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
 3. Cover Insulation: Fiberglass of 1 inch thickness, fully covered and protected by an 18 gauge aluminum liner.
 4. Curb: 12 inches in height and of 11 gauge aluminum. The curb shall be formed with a 3-1/2 inch wide flange with 7/16 inch diameter holes provided for securing to the roof deck. Curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, with flashing system, including stamped tabs, 6 inches on center, bent inward.
 5. Curb Insulation: Rigid, high-density fiberboard of 1 inch thickness on outside of curb.
 6. Lifting Mechanisms: Provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

7. Hardware:
 - a. Heavy pintle hinges.
 - b. Cover shall be equipped with a spring latch with interior and exterior turn handles.
 - c. Roof hatch shall be equipped with interior and exterior padlock hasps.
 - d. The latch strike shall be a stamped component bolted to the curb assembly.
 - e. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1 inch diameter red vinyl grip handle to permit easy release for closing.
 - f. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be Type 316 stainless steel.
 - g. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
8. Finish: Factory finish shall be mill finish aluminum.

1.3 ROOF HATCH GUARDS

A. Performance Characteristics:

1. High visibility safety yellow color shall be molded in.
2. Hatch rail system shall attach to the capflashing of the roof hatch and shall not penetrate any roofing material.
3. Hatch rail system shall satisfy the requirements of OSHA 29 CFR 1910.23 and shall meet OSHA strength requirements with a factor of safety of two.
4. UV and corrosion resistant construction with a twenty-five year warranty.
5. Self-closing gate shall be provided with hatch rail system.

B. Posts and Rails: Shall be round pultruded reinforced fire retardant yellow fiberglass treated with a UV inhibitor.

C. Hardware: Mounting brackets shall be 1/4 inch thick hot dip galvanized steel. Hinges and post guides shall be 6063-T5 aluminum. Fasteners shall be Type 316 stainless steel.

1.4 FABRICATION

- A. Fabricate components free of visual distortion or defects. Weld corners and joints.
- B. Provide for removal of condensation occurring within components or assembly.
- C. Fit components for weathertight assembly.

END OF SECTION

SECTION 07 72 56
FALL PROTECTION DEVICES

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Guardian Fall Protection Inc., Kent, WA; 800-466-6385, www.guardianfall.com.
Products:
 - a. CB-12 or CB-18 Galvanized Roof Anchors.
 - b. Part #00815 Bucket of Safe-Tie, including velocity harness, vertical lifeline with shockpack, and reusable temper anchor in a five gallon plastic bucket.
2. Flexible Lifeline Systems, Houston, TX; 832-448-2900, www.fall-arrest.com.
3. Tractel Ltd., Fallstop Division, Anjou, Quebec, Canada; 800-561-3229, www.tractel.com.

1.2 MATERIALS

- A. Anchor Post: 2-1/2 inch diameter Schedule 80 pipe, galvanized steel; size as necessary for height.
- B. Anchor U-bar: 5/8 inch diameter U-bar, galvanized steel.
- C. Anchor Base Plate: Galvanized steel.

1.3 FABRICATION

- A. Fabricate work true to dimension, square, plumb, level, and free from distortions or defects detrimental to appearance and performance.
- B. Prepare, treat, and coat galvanized metal to comply with manufacturer's written instructions. Prepare galvanized metal by removing grease, dirt, oil, flux, and other foreign matter.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 PRODUCTS

1.1 GENERAL

- A. Provide and install firestopping materials to meet applicable codes and installation requirements for each firestopping application. Products using caulking, putty, wrap strips, mortar, composite boards and/or mechanical devices shall be used as appropriate for the specific condition.
- B. When caulking is used, provide and install flexible caulking materials. Cured firestop materials 1/8 inch thick shall be able to bend around a 1 inch mandrel without breaking.
- C. Provide products that upon curing do not re-emulsify, dissolve, leach, breakdown or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture characteristic during and after construction. Latex sealants containing sodium silicate or other water soluble intumescent ingredients are not permitted.
- D. Provide firestop sealants sufficiently flexible to accommodate motion such as pipe vibration, water hammer, thermal expansion and other normal building movement without damage to the seal.
- E. Pipe insulation shall not be removed, cut away or otherwise interrupted through wall or floor openings. Provide products appropriately tested for the thickness and type of insulation utilized.
- F. Fire rated pathway devices shall be the preferred product and shall be installed in all locations where frequent cable moves, add-ons and changes will occur.
- G. When mechanical cable pathways are not practical, openings within walls and floors designed to accommodate voice, data and video cabling shall be provided with re-enterable products specifically designed for retrofit.
- H. Penetrants passing through fire-resistance rated floor-ceiling assemblies contained within chase wall assemblies shall be protected with products tested by being fully exposed to the fire outside of the chase wall. Systems within the UL Fire Resistance Directory that meet this criterion are identified with the words "Chase Wall Optional".
- I. Provide fire-resistive joint sealants sufficiently flexible to accommodate movement such as thermal expansion and other normal building movement without damage to the seal.
- J. Provide fire-resistive joint sealants designed to accommodate a specific range of movement and tested for this purpose in accordance with a cyclic movement test criteria as outlined in UL 2079.
- K. Provide penetration firestop systems subjected to an air leakage test conducted in accordance with Standard, UL 1479 for penetrations with published L-Ratings for ambient and elevated temperatures as evidence of the ability of firestop system to restrict the movement of smoke.

- L. Provide T-Rating Collar Devices tested in accordance with ASTM E814 or UL 1479 for metallic pipe penetrations requiring T-Ratings per the applicable building code.
- M. Provide firestopping composed of components that are listed as compatible with each other, the substrates forming openings and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- N. Provide components for each firestopping system that is needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance rated systems.
- O. At through penetrations of fire rated assemblies, provide a firestop system with an "F" rating as determined by UL 1479 or ASTM E814 that is equal to the time rating of construction assembly.
- P. At fire rated assemblies, provide a firestop system with an Assembly Rating as determined by UL 2079 that is equal to the time rating of construction assembly.

1.2 MINERAL WOOL INSULATION

- A. Acceptable Manufacturers and Products:
 - 1. Owens Corning Thermafiber, Inc., Wabash, IN; 888-834-2371, www.thermafiber.com.
 - 2. Johns Manville, Denver, CO; 800-654-3103, www.jm.com.
 - 3. Rockwool, Milton, Ontario, Canada; 800-265-6878, www.rockwool.com.
- B. At through penetrations, head of wall construction gaps, and perimeter safining slots, provide required density mineral wool per tested system, installed with correct orientation for joint movement and properly compressed per tested system.
- C. Accessories: Provide all accessories and anchors for installation as recommended by the manufacturer.

1.3 FIRESTOP SEALANTS

- A. Sealant for penetrations by noncombustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT).
- B. Silicone Sealants:
 - 1. Acceptable Manufacturers and Products:
 - a. Specified Technologies Inc. (STI), Somerville, NJ; 800-992-1180, www.stifirestop.com. Product: SpecSeal SIL Silicone Firestop Sealant.
 - b. Hilti, Tulsa, OK; 866-445-8827, www.us.hilti.com. Product: CFS-S SIL Silicone Sealant.
 - c. 3M, St. Paul, MN; 800-328-1687, www.solutions.3m.com. Products: Fire Barrier Water Tight Sealant 1003 SL or Fire Barrier Silicone Sealant 2000+.
 - 2. Sealant shall be a one-part silicone compound, non-sag for vertical applications and self-leveling for horizontal applications. Sealant shall be UL Classified (UL 1479) and tested in accordance with ASTM E814 requirements. Penetrations in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7 requirements.

C. Intumescent Latex Sealants:

1. Acceptable Manufacturers and Products:

- a. Specified Technologies Inc. (STI), Somerville, NJ; 800-992-1180, www.stifirestop.com. Products: SpecSeal Series SSS Sealant, SpecSeal LCI Sealant, LC Sealant.
 - b. Hilti, Tulsa, OK; 866-445-8827, www.us.hilti.com. Product: FS-One Max.
2. Sealant shall be a one-part intumescent latex compound. When exposed to high heat or flame, sealant shall be capable of expanding to seal off the annular spaces and voids at the joint. Expansion shall continue at temperatures greater than 230 degrees F. Sealant shall be thixotropic and suitable for caulking or troweling onto vertical and overhead surfaces. Sealant shall be UL Classified (UL 1479) and tested in accordance with ASTM E814 requirements. Penetrations in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7 requirements.

1.4 ELASTOMERIC FIRESTOP SEALANT

- A. Sealant for penetrations and joints between structurally separate sections of walls and floors at top-of-walls.
- B. Acceptable Manufacturers and Products:
 1. STI. Product: SpecSeal Series ES100 Elastomeric Sealant.
 2. Hilti. Products: CFS-S SIL GG or CFS-S SIL SL.
 3. 3M. Products: Fire Barrier Sealants 1000, 1003, 2000, 2000+, 2001, and 2003.
- C. Elastomeric sealant shall be a non-halogenated, latex-based or silicone-based, highly flexible caulk. The sealant shall be thixotropic for high-build application using standard caulking equipment or by troweling onto vertical surfaces or overhead. Self-leveling sealants are acceptable for horizontal applications. The sealant shall be UL Classified (UL 2079) and tested to the requirements of ASTM E814. Closures in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7.

1.5 FIRESTOP PUTTY

- A. Putty for penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed flexible cable, or cable bundles and plastic pipe (closed piping systems). Clay-based products will not be allowed.
- B. Acceptable Manufacturers and Products:
 1. STI. Product: SpecSeal SSP Putty.
- C. Putty shall be a one-part intumescent, non-hardening compound. The putty, when exposed to high heat or flame shall be capable of expanding to seal off annular spaces created. Range of continuing expansion shall be from 230 degrees F to greater than 1,000 degrees F. The putty shall be soft and pliable with aggressive adhesion. The putty shall be UL Classified (UL 1479) and tested to the requirements of ASTM E814. Penetrations in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7.

1.6 INTUMESCENT PUTTY PAD

- A. Firestop Putty Pads for Electrical Boxes: Intumescent moldable butyl-based firestop putty pad. Clay-based products will not be allowed.

B. Acceptable Manufacturers and Products:

1. STI. Products:

- a. SpecSeal SSP4S 7.25 inches by 7.25 inches.
- b. SpecSeal SSP9S 9 inches by 9 inches.

1.7 FLEXIBLE FIRESTOP SPRAY

A. Firestop spray for perimeter fire barrier system, fire-rated construction joints, and other gaps.

B. Acceptable Manufacturers and Products:

1. STI. Products: SpecSeal AS200 Elastomeric Firestop Spray or SpecSeal Fast Tack Elastomeric Silicone/Urethane Hybrid Firestop Spray.
2. Hilti. Product: CFS-SP WB.
3. 3M. Products: Firedam Spray and Fire Barrier Spray.

C. Spray shall be flexible, sprayable water-based coating that dries in ambient conditions to form a flexible seal that will compress/extend with the intended range of the joint. The spray shall be UL classified (UL 2079) and tested to the requirements of ASTM E1966. Closures in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7. Provide silicone-based firestopping products where building perimeter fire barrier systems are required.

1.8 HEAD-OF-WALL GASKET

A. Intumescent cover for head-of-wall track providing fire, smoke, and acoustic ratings.

B. Acceptable Manufacturers and Products:

1. STI. Product: SpecSeal Series TTG SpeedFlexTrack Top Gasket.
2. Hilti. Product: CFS-TTS Top Track System.

C. Preformed gasket shall be UL classified (UL 2079) and tested to the requirements of ASTM E1966. Closures in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7.

1.9 FIRESTOP COLLARS

A. Collars for penetrations by combustible plastic pipe (opening piping systems).

B. Acceptable Manufacturers and Products:

1. STI. Products: SpecSeal SSC or SpecSeal LLC Firestop Collar.
2. Hilti. Product: CP642/CP643 Firestop Collar.
3. 3M. Products: Fire Barrier PPD Plastic Pipe Device and Ultra Plastic Pipe Device.

C. Firestop collar shall be made of a galvanized steel housing and shall contain a section of intumescent material. The material shall be designed to expand when exposed to fire. The collars shall be UL classified (UL 1479) and tested to the requirements of ASTM E814. Closures in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7.

1.10 FIRESTOPPING FOR LARGE OPENINGS

- A. Firestopping for large size, complex penetrations made to accommodate cable trays, multiple steel and copper pipes and electrical busways in raceways. Products may be used in conjunction with other firestopping products, systems, and devices.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Products: SpecSeal SSB Firestop Pillows, SpecSeal CS Composite Sheet, or SpecSeal SSM Mortar.
 - 2. Hilti. Product: FS 657 Fire Block.
 - 3. 3M. Product: Fire Barrier Pillows or Fire Barrier CS-195+ Composite Sheet and Fire Barrier Mortar.
- C. For large openings, install intumescent compound or mortar. Intumescent compounds, when exposed to high heat or flame, shall be capable of expanding to seal off annular spaces created. Product shall be UL classified (UL 1479) and tested to the requirements of ASTM E814. Closures in fire rated assemblies shall be protected and sealed in accordance with CBC Chapter 7.

1.11 CAST-IN-PLACE FIRESTOP DEVICES

- A. Devices for use with non-combustible and combustible pipes (closed and open piping systems), conduit, and cable bundles penetrating concrete floors and framed gypsum board wall assemblies.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal CD Cast-In Firestop Device.
 - a. Accessories:
 - 1) Add Aerator Adapter when used in conjunction with aerator (Sovent) system.
 - 2) Metal Deck Adapters on corrugated metal decks.
 - 3) Extension Tubes where required for thick concrete floors.
 - 2. Hilti. Products:
 - a. CP 680-P Cast-in-Place Firestop Device.
 - 1) Add Aerator Adapter when used in conjunction with aerator (Sovent) system.
 - b. CP 680-M Cast-in-Place Firestop Device for use with non-combustible penetrants.
- C. Acceptable Penetrations: Sealing pipes and cables up to 6 inches in diameter in penetration through fire-rated floors, suitable for: vented or closed plastic pipes, PVC, CPVC, ABS, innerduct, FRPP, steel, cast-iron, copper pipes, insulated steel and copper pipes, EMT and ENT electrical conduits, bundled cables, and blank openings.

1.12 INTUMESCENT WRAP

- A. Intumescent Wrap: Precut wrap strips for plastic and insulated pipe penetration through rated assemblies.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Products: SpecSeal RED2 or SpecSeal BLU2 Wrap Strip.
 - 2. Hilti. Product: CP 648, Firestop Wrap Strip.

1.13 FIRESTOP MORTAR

- A. Fire-resistant, cement-based mortar for firestop-sealing medium-sized to large openings with non-combustible pipes or cable trays, and permanent fire seal for cables, cable trays and non-combustible pipes. For use with concrete and masonry assemblies, and for walls and floors rated up to three hours.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal SSM Firestop Mortar.
 - 2. Hilti. Product: FS 637 Trowelable Firestop Compound.

1.14 FIRE-RATED CABLE PATHWAY

- A. Gangable fire-rated device modules capable of retrofit, comprised of steel raceway with intumescent foam pads allowing 0 percent to 100 percent cable fill for cable penetrations through gypsum or CMU walls, concrete floors and concrete walls.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal EZ Path Pathway Device Series 22, 33 or 44.

1.15 FIRE-RATED HVAC RETAINING ANGLES

- A. Steel angle system with integral intumescent firestop gasket for use on steel HVAC ducts.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal Fyre-Flange Steel Firestop Retaining Angle.

1.16 FIRESTOP PLUGS

- A. Re-enterable, foam rubber plug impregnated with intumescent material for use in blank openings and cable sleeves.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal FP Firestop Plug.

1.17 FIRE-RATED T COLLAR DEVICES

- A. Louvered steel collar system with synthetic aluminized polymer coolant wrap installed on metallic pipes where T Ratings are required by applicable building code requirements.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal T-Collar Device.

1.18 FIRE-RATED GROMMETS

- A. Molded two-piece grommet made from plenum grade polymer with a foam inner core for sealing individual cable penetrations up to 0.27 inch diameter.
- B. Acceptable Manufacturers and Products:
 - 1. STI. Product: SpecSeal Ready Firestop Grommet.

1.19 ACCESSORIES

- A. Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Tremco Sealant Weatherproofing Division of RPM International, Inc., Beachwood, OH; 800-321-7906, www.tremcosealants.com.
2. The Dow Chemical Company, Midland, MI; 800-331-6451, www.consumer.dow.com.
3. GE Silicones, Huntersville, NC; 951-201-2000, www.gesilicones.com.
4. Pecora Corporation, Harleysville, PA; 800-523-6688, www.pecora.com.
5. BASF Corporation – Building Systems, Shakopee, MN; 800-433-9517 www.buildingsystems.basf.com.
6. Sika Corporation, Lyndhurst, NJ; 800-933-7452, www.sikaconstruction.com.
7. USG – United States Gypsum Co., Chicago, IL; 800-874-4968, www.usg.com.
8. The Euclid Chemical Company, Cleveland, OH; 800-321-7628, www.euclidchemical.com.
9. Specified Technologies Inc. (STI), Somerville, NJ; 800-992-1180, www.stifirestop.com.

1.2 SEALANTS

A. General:

1. Provide sealants that have been tested and found suitable for the substrates to which they will be applied.
2. Color: As selected by Architect from manufacturer's full range of colors.

B. Exterior Sealants:

1. Exterior Perimeter Sealant: Polyurethane sealant; ASTM C920; Type M; Grade NS; Class 50; uses: A, I, M, NT, O, T.
 - a. Products:
 - 1) Tremco Dymeric 240FC.
 - 2) BASF MasterSeal NP150 Tint Base.
 - 3) Sika Sikaflex-2c NS.
 - 4) or accepted equal.
 - b. Use at exterior vertical joints bordered on one or both sides by:
 - 1) Porous materials such as concrete or masonry.
 - 2) Non-porous materials such as painted metal, anodized or mill finish aluminum.

2. Exterior Perimeter Sealant: Ultra-low modulus moisture curing, non-staining, non-bleeding silicone sealant; ASTM C920; Type S; Grade NS; Class 100/50; uses: A, G, M, NT, O.
 - a. Products:
 - 1) Tremco Spectrem 1.
 - 2) The Dow Chemical Company Dowsil 790 Silicone Building Sealant.
 - 3) Pecora 890NST.
 - 4) Sika Sikasil WS-290.
 - 5) or accepted equal.
 - b. Use at exterior vertical joints bordered on one or both sides by concrete, metal and/or window perimeters.
3. EIFS Sealant: Low modulus chemical curing, non-staining, non-bleeding, oligomeric polyurethane sealant; ASTM C920; Type M; Grade NS; Class 50; uses: A, I, M, NT, O, T.
 - a. Products:
 - 1) Tremco Dymeric 240FC.
 - 2) BASF MasterSeal NP150 Tint Base.
 - 3) Sika Sikaflex-2c NS.
 - 4) or accepted equal.
 - b. Use at exterior vertical joints bordered on one or both sides by exterior insulation and finish system (EIFS).
4. Glazing Sealant: Medium modulus, neutral curing, non-staining, non-bleeding silicone sealant; ASTM C920; Type S; Grade NS; Class 50; uses: A, G, M, NT, O.
 - a. Products:
 - 1) Tremco Spectrem 2.
 - 2) The Dow Chemical Company Dowsil 795 Silicone Building Sealant.
 - 3) GE Silicones SilPruf SCS2000.
 - 4) Pecora 895NST.
 - 5) Sika Sikasil WS-295.
 - 6) or accepted equal.
 - b. Use at exterior joints in window wall systems such as glass to glass, glass to metal, and metal to metal joints.
5. Traffic Sealant: Self leveling, chemical curing, non-staining, non-bleeding polyurethane sealant; ASTM C920; Type M; Grade NS or Grade P; Class 25; uses: M, O, T.
 - a. Products:
 - 1) Tremco THC900.
 - 2) Pecora Corp. Urexpan NR-200.
 - 3) BASF MasterSeal SL 2.
 - 4) Sika Sikaflex-2c NS TG.
 - 5) or accepted equal.

- b. Use at:
 - 1) Exterior horizontal traffic expansion joints in concrete with slopes less than five percent.
 - 2) Interior horizontal traffic joints in low-slope concrete with slopes less than five percent.
 - 6. Traffic Sealant: Slope grade chemical curing, non-staining, non-bleeding polyurethane sealant; ASTM C920; Type M; Grade P; Class 25; use: T.
 - a. Products:
 - 1) Tremco THC 901.
 - 2) Pecora Corp. DynaTrol II-SG.
 - 3) BASF MasterSeal SL 2 Slope Grade.
 - 4) or accepted equal.
 - b. Use at:
 - 1) Exterior horizontal traffic expansion joints in concrete with slopes between five percent and ten percent.
 - 2) Interior horizontal traffic joints in concrete with slopes between five percent and ten percent.
 - 7. Metal Lap and Bedding Sealant (non-soldered flashings): Non-drying, non-skinning, non-curing flexible butyl rubber sealant; ASTM C1311; Type S; Grade NS; Class 10; uses: G, M, O.
 - a. Products:
 - 1) Tremco Butyl Sealant.
 - 2) Pecora Corp. BA-98 Butyl Rubber Sealant.
 - 3) or accepted equal.
 - b. Use for bedding thresholds, glazing secondary seals, and sheet metal flashing and trim not exposed to ultraviolet (UV) light.
 - 8. Metal Lap and Bedding Sealant (non-soldered flashings): High performance, moisture curing, gun grade polyurethane sealant; ASTM C920; Type S; Grade NS; Class 25; use: A, I, M, NT, O, T.
 - a. Products:
 - 1) Tremco Vulkem 116.
 - 2) BASF MasterSeal TX1.
 - 3) Sika Sikaflex Textured Sealant.
 - 4) or accepted equal.
 - b. Use for bedding thresholds, glazing secondary seals, and sheet metal flashing and trim exposed to ultraviolet (UV) light.
- C. Interior Sealants:
- 1. Interior Sealant: Nonoxidizing, skinnable, paintable, gunnable, non-staining, non-bleeding acrylic latex sealant; ASTM C834; Type S; Grade NS; Class 12.5; use: O.
 - a. Products:
 - 1) Tremco Tremflex 834.

- 2) Pecora Corp. AC-20 + Silicone.
 - 3) or accepted equal.
 - b. Use at interior trim and finish joints expecting minimal movement.
2. Interior Sealant: Low modulus, moisture curing, non-staining, non-bleeding polyurethane sealant; ASTM C920; Type S; Grade NS; Class 35; uses: A, M, NT, O.
 - a. Products:
 - 1) Tremco Dymonic FC.
 - 2) Euclid Chemical Company Eucolastic 1NS.
 - 3) or accepted equal.
 - b. Use at interior vertical expansion, control, and air seal joints.
3. Sanitary Sealant: Mildew resistant with fungicide, acetoxo curing, non-staining, non-bleeding silicone sealant; ASTM C920; Type S; Grade NS; Class 25; uses: A, G, NT, O.
 - a. Products:
 - 1) Tremco Tremsil 200 Sanitary.
 - 2) The Dow Chemical Company Dowsil 785 Mildew Resistant.
 - 3) GE Silicones Sanitary SCS 1700.
 - 4) Pecora 898NST.
 - 5) Sika Sikasil-N Plus US.
 - 6) or accepted equal.
 - b. Use at interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures.
4. Acoustical Sealant: Non-skinning, non-hardening synthetic rubber sealant; ASTM C919; Type S; Grade NS; use: O.
 - a. Products:
 - 1) Tremco Acoustical Sealant.
 - 2) Pecora BA-98.
 - 3) or accepted equal.
 - b. Use at concealed joints and penetrations in interior acoustical walls.
5. Acoustical Sealant: Nonoxidizing, skinnable, paintable, gunnable, non-staining, non-bleeding acrylic latex sealant; ASTM C834 and C919; Type S; Grade NS; Class 12.5; use: O.
 - a. Products:
 - 1) Tremco Tremflex 834.
 - 2) Pecora Corp. AC-20 FTR.
 - 3) USG Sheetrock Brand Acoustical Sealant.
 - 4) STI SpecSeal Smoke "N" Sound Sealant.
 - 5) or accepted equal.
 - b. Use at exposed joints and penetrations in interior acoustical walls.

1.3 ACCESSORIES

- A. Joint Cleaner: Non-corrosive and non-staining type as recommended by sealant manufacturer; compatible with joint forming materials.
- B. Primers: Non-staining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.
- C. Joint Backing: Non-adhering backing to sealant; non-staining, compatible with sealant and primer such as round, closed cell or bi-cell polyethylene foam rod; oversized 25 percent to 50 percent larger than joint width. Materials impregnated with oil, bitumen or similar materials are not permitted.
- D. Bond Breakers: Type and consistency recommended by the sealant manufacturer to suit the particular application.
- E. Bond Breaker Tape: Self-adhesive, pressure sensitive polyethylene tape.
- F. Masking Tape: Non-staining, non-absorbent tape compatible with joint sealants and adjacent joint surfaces.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 PRODUCTS

1. Ceco Door Products, Milan, TN; 888-232-6366, www.cecodoor.com.
2. Curries Company, Mason City, IA; 800-377-3948, www.curries.com.
3. Steelcraft, Cincinnati, OH; 877-671-7011, www.steelcraft.com.
4. Door Components Inc., Fontana, CA; 866-989-3667, www.doorcomponents.com.

1.2 MATERIALS

- A. Cold-Rolled Steel Sheets for Doors and Frames: Commercial Steel (CS), Type B, complying with ASTM A1008/A1008M.
 1. Use cold-rolled steel for door frames and exposed-to-view surfaces.
- B. Hot-Rolled Steel Sheets and Strip for use at Door Frames: Commercial Steel (CS), Type B; complying with ASTM A1011/A1011M.
 1. Steel shall be free of mill scales, pitting, or surface defects; pickled and oiled.
 2. Use hot-rolled steel for reinforcement and concealed components only.
- C. Factory-Applied Primer: Manufacturer's standard primer, thickness: two mils minimum, and compatible with ferrous and galvanized metal primers specified in Section 09 91 00.
- D. Refer to Section 08 81 00 and Section 08 88 13 for glass glazing requirements.
- E. Refer to Section 08 71 00 for hardware requirements.

1.3 STANDARD HOLLOW METAL DOOR FABRICATION

- A. General: Fabricate to sizes shown, providing necessary clearances and bevels to permit operation without binding. Doors shall be free from warp, wave, buckle or other defect. Doors shall be 1-3/4 inches thick, unless otherwise indicated on Drawings.
- B. Flush Door Construction: Door shall be Grade III, Model 2, fabricated with face sheets of 16 gauge steel in accordance with ANSI/SDI A250.8 and galvanized to ASTM A653/A653M A60 at exterior locations and interior wet locations. Door shall be flush with edge seams, weld filled and ground smooth. Bevel lock edge 1/8 inch in 2 inches. Door shall be provided with 16 gauge steel top flush cap welded and ground smooth, and bottom inverted 14 gauge steel channels welded within the door. Door shall be reinforced, stiffened and sound deadened with impregnated kraft honeycomb core completely filling door cavity, and laminated to the inside faces of panels.
 1. Exterior doors shall be insulated with an expanded polystyrene or polyurethane core, or as standard with manufacturer. Completely fill door cavity with insulation. Expanded polystyrene to be ASTM C578, Type 1 or Type 2, with minimum one pound per cubic foot density.

- C. Preparation of Hardware: Per ANSI/SDI A250.6, door shall be mortised, reinforced, drilled and tapped at the factory from templates for all mortise hardware listed in the Hardware Schedule. Door shall be reinforced for surface applied hardware such as closers, checks, escutcheons and kick plates; drilling and tapping to be done in the field by door installer. Reinforcement to be 12 gauge for locksets and latchsets, and 14 gauge for surface applied hardware, except use 3/16-inch thick plate for butt hinges. Door shall be provided with reinforcing unit as recommended by lock manufacturer.
- D. Hardware Mounting Heights and Door Clearances: In accordance with California Building Code and applicable requirements of Section 08 71 00.

1.4 STANDARD HOLLOW METAL FRAME FABRICATION

- A. General:
 - 1. Provide fully-welded frames.
 - 2. Hollow metal frames shall be formed to shapes and sizes shown.
- B. Full Profile Welded Frames: Head and jamb splices shall be fabricated with mitered, coped and continuously welded inside and outside corners and be finished on the outside face to present a smooth surface for painting.
- C. Frames shall be fabricated from 16 gauge steel, and shall be designed with integral stop and trim. All corners shall be reinforced with 18 gauge "L" shaped reinforcements welded on the inside face of the frame.
- D. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- E. Frames shall be galvanized to ASTM A653/A653M A60 at exterior locations and interior wet locations.
- F. Preparation for Hardware: Per ANSI/SDI A250.6, frame shall be prepared at the factory for all hardware using templates furnished by hardware supplier. Locations of miscellaneous hardware shall conform to the recommendations for the Door and Hardware Institute. Mortise, reinforce, drill and tap for mortise type hardware. Reinforce frames for surface applied hardware; drilling and tapping to be done in the field by door installer.
 - 1. Hardware cutouts shall have steel plate reinforcements with tapped holes fillet welded to frame on all four sides of the plate. Fillet welds shall be minimum 1 inch long. Reinforcement shall include 3/16 inch butt reinforcement; 12 gauge lock strike; 14 gauge for surface applied items.
 - 2. Provide strike stops at frames to receive hollow metal or wood doors with holes for three rubber door silencers. On double door frames, provide for two silencers per door at head. Omit holes at frames to receive unitized gasketing; refer to Section 08 71 00.

1.5 BORROWED LIGHTS (INTERIOR WINDOWS, FIXED)

- A. Interior Window Units: Furnish shop assembled and welded units for fixed windows, fabricated to the designs and dimensions indicated. Provide metal glazing stops and mouldings of same gauge as frame on secure side of window for field assembly with countersunk oval head self-tapping screws spaced not over 16 inches on center. Frames shall be complete with all corners welded, ground smooth, and provided with anchors.

1.6 ANCHORS

- A. Frame shall be anchored to structure with anchors appropriate for use with type of adjacent construction. Anchorage shall securely fasten frames to wall construction involved. Provide a minimum three anchors, including one adjustable floor anchor, at each door jamb. Frames taller than eight feet in height will require additional anchors at each jamb. Anchors shall be minimum 16 gauge steel and shall provide stiffness and rigidity to keep frames square, in accurate position without twisting, buckling or warping. Fasteners to framing substrate shall be the following minimums; greater as required by the frame manufacturer or as conditions warrant:
1. Metal Framing: Two #10 self-tapping sheet metal screws per anchor, length as required; fastener to penetrate a minimum of 1/4 inch into framing member.
 2. Concrete/Masonry: 1/4 inch diameter stainless steel wedge anchors, three per jamb, with 1-1/2 inches minimum embedment into substrate and 2 inches minimum edge distance to face of substrate.

1.7 PRIMING

- A. Doors and frames shall be leveled and welds ground smooth. Apply mineral filler to eliminate weld scars and other blemishes.
- B. Shop Priming: All surfaces shall be cleaned, phosphatized, and given one coat of baked-on rust-inhibiting primer in accordance with the Steel Door Institute Specification "Test Procedure and Acceptance Criteria for Primer Painted Steel Doors and Frames".
1. Do not prime paint over fire-rated door and frame labels.

1.8 ACCESSORIES

- A. Glazing Stops: LoPro by Anemostat or Slimline by Air Louvers, Inc. Galvanized steel; mitered corners; prepared for countersink style screws. Sizes as indicated on Drawings. Install glazing stop fasteners on the non-secure side of doors. Finish shall be factory primed to receive site paint finish, color as selected by Architect.
1. At fire-rated assemblies, fire-rating of glazing stops shall match fire-rating of opening. Fire-rated glazing stops shall bear the listing mark of Underwriters Laboratories and/or Warnock Hersey, and shall be visible without removal of the frame from the door.
- B. Glass Glazing: As specified in Section 08 81 00 and Section 08 88 13.
- C. Non-Rated Door Louvers: AFDL by Anemostat or Model 800 A1 by Air Louvers, Inc. Fabricate from galvanized cold rolled steel sheet. Frame shall be 18 gauge and blades shall be 22 gauge. Permanent interlocking construction shall be used to secure blades to frame on stationary louvers. Frames shall have mitered and flush welded corners. Factory install screens, aluminum wire mesh. Louvers shall have fifty percent free area minimum; sizes as indicated on Drawings. Finish shall be factory primed to receive site paint finish, color as selected by Architect.

- D. Fire-Rated Fusible Link Door Louvers: FLDL-W by Anemostat or Model 1900A by Air Louvers, Inc. Fire-rating of louver shall match fire-rating of opening. Fire-rated louvers shall bear the listing mark of Underwriters Laboratories and/or Warnock Hersey, and shall be visible without removal of the frame from the door. Fabricate from galvanized cold rolled steel sheet. Frames shall have mitered and flush welded corners. Factory install screens, aluminum wire mesh. Louvers shall have fifty percent free area minimum; size as indicated on Drawings. Finish shall be factory primed to receive site paint finish, color as selected by Architect.

END OF SECTION

SECTION 08 14 00

WOOD DOORS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Eggers Industries, Two Rivers, WI; 920-793-1351, www.eggersindustries.com.
2. Oregon Door, Winston, OR; 541-679-6791, www.oregondoor.com.
3. VT Industries, Holstein, IA; 800-827-1615, www.vtindustries.com.

1.2 DOOR CONSTRUCTION

- A. All doors shall be 1-3/4 inch thickness, unless noted otherwise.
- B. Solid, non-rated particleboard core: WI/AWMAC Section 9, 5-ply; Custom Grade.
- C. Solid, 20-minute rated particleboard core: WI/AWMAC Section 9, 5-ply, Custom Grade.
- D. Solid, 45-, 60- and 90-minute rated mineral core: WI/AWMAC Section 9. Stile edges shall be a minimum of 1 inch before trim on hinge side and 3/4 inch on lock side, including 1/4 inch outer edge band of hardwood.
- E. Faces:
 1. Veneer Species: Stain grade select white maple veneer for transparent finish.
 2. Cut: Quarter cut.
 3. Grade: A Grade.
 4. Match between Veneer Leaves: Book match.
 5. Assembly of Veneer Leaves on Door Faces: Balance match.
 6. Face veneers for pairs of doors shall be selected for color and grain match. Face veneers shall not be less than 1/50 inch at 12 percent moisture content after factory sanding. Crossbanding shall be high density fiberboard (HDF), MDF will not be allowed as a veneer substrate (crossband). Thin veneers are not acceptable.
 7. Use solid stock for exposed edges to match face veneer.
- F. Provide solid blocking on doors with surface mounted hardware or closers, for attachment with screws in lieu of through-bolts.
- G. Top and bottom rails shall be a minimum of 2-1/4 inch before trimming, mill option species structural composite lumber for 20 minute rated and non-rated doors.
- H. Fire Resistive Doors with 20 Minute Fire Rating (positive pressure): Construction shall have fire rating of not less than 20 minutes when tested in accordance with NFPA 252 or UL 10C and SFM Standard 12-7-4.
- I. Fire Resistive Doors with 45 Minute or Longer Fire Ratings (positive pressure): Meet requirements of SFM Standard 12-7-4, UL 10 (b)-80, and ASTM F152 for fire rating noted.

1.3 ADHESIVE

- A. Facing Adhesive: Type I – waterproof.

1.4 ACCESSORIES

- A. Glazing Stops: LoPro by Anemostat or Slimline by Air Louvers, Inc. Steel; mitered corners; prepared for countersink style screws. Sizes as indicated on Drawings. Install glazing stop fasteners on the non-secure side of doors. Factory paint finish in custom color as selected by Architect.

1. At fire-rated assemblies, fire-rating of glazing stops shall match fire-rating of opening. Fire-rated glazing stops shall bear the listing mark of Underwriters Laboratories and/or Warnock Hersey, and shall be visible without removal of the frame from the door.

- B. Glass Glazing: As specified in Section 08 81 00 and Section 08 88 13.

- C. Non-Rated Door Louvers: Anemostat Model ADFL or Air Louver. Fabricate from cold rolled steel sheet. Frame shall be 18 gauge and blades shall be 22 gauge. Permanent interlocking construction shall be used to secure blades to frame on fixed or stationary louvers. All frames shall have mitered and flush welded corners. Louvers shall have fifty percent free air minimum; size as indicated on Drawings. Factory paint finish in custom color as selected by Architect.

- D. Fire-Rated Fusible Link Door Louvers: FLDL-W by Anemostat or Model 1900A by Air Louvers, Inc. Fire-rating of louver shall match fire-rating of opening. Fire-rated louvers shall bear the listing mark of Underwriters Laboratories and/or Warnock Hersey, and shall be visible without removal of the frame from the door. Fabricate from cold rolled steel sheet. Frames shall have mitered and flush welded corners. Factory install screens, aluminum wire mesh. Louvers shall have fifty percent free area minimum; size as indicated on Drawings. Factory paint finish in custom color as selected by Architect.

1.5 FABRICATION

- A. Fabricate non-rated doors in accordance with WI/AWMAC North American Architectural Woodwork Standards requirements.
- B. Provide blocking at top of door for closer for attachment with screws.
- C. Bond edge banding to cores.
- D. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.
- E. Undercut doors where indicated on Drawings.
- F. Glass Cutouts: Provide cutouts for glass of size and shape indicated. Glass for doors is specified under Section 08 81 00 and Section 08 88 13.
- G. Louver Cutouts: Provide cutouts for louvers of size and shape indicated.
- H. Factory seal top and bottom rails before shipment.
- I. Bevel both stiles 1/8 inch in 2 inches (3 degree bevel) and undersize doors 1/4 inch in width so that they swing freely and do not hinge bind.

1.6 FINISH

- A. All doors shall be factory pre-finished, equal to WI/AWMAC Section 5, System #3, or accepted equal. Transparent finish; custom stain color, and tone as selected by Architect and accepted on submitted sample. Apply finish at all faces and edges of doors.

END OF SECTION

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Nystrom Building Products, Minneapolis, MN 55428; phone: 800.547.2635, fax: 800.317.8770, www.nystrom.com.
2. Karp Associates, Inc., Maspeth, NY 11378; phone: 718.784.2105, www.karpinc.com.
3. J.L. Industries Inc., Bloomington, MN 55435; phone: 952.835.6850, fax: 952.835.2218, www.jlindustries.com.
4. Milcor, Inc., Holland, OH 43528; phone: 800.528.4144, www.milcorinc.com.

1.2 ACCESS DOORS

A. Fire-Rated Access Doors for Gypsum Board:

1. Product: UL rating 1.5 hours (B label); ITS rating 3 hours in ceiling.
 - a. Nystrom, Model IW.
 - b. Karp, Model KRP-350FR.
2. Components:
 - a. Sizes: As shown on the Drawings.
 - b. Frame: 16 gauge steel.
 - c. Door: 20 gauge steel.
 - d. Hinge: Continuous piano hinge (Karp), concealed pin hinge (Nystrom).
 - e. Latch: Bolt type, key operated, self-latching with automatic closer and interior latch release.
 - f. Insulation: 2 inch thick fire rated mineral fiber.
 - g. Finish: Phosphate dipped, and prime coat of rust inhibitive electrostatic powder, baked grey enamel.

B. Non-Rated Access Doors for Gypsum Board:

1. Product:
 - a. Nystrom, Model NW.
 - b. Karp, Model KDW.
2. Components:
 - a. Sizes: As shown on the Drawings.
 - b. Frame: 16 gauge steel.
 - c. Door: 14 gauge steel.
 - d. Hinge: Concealed continuous piano hinge.
 - e. Latch: Key operated, stainless steel cam and stud.

- f. Finish: Phosphate dipped, and prime coat of rust inhibitive electrostatic powder, baked grey enamel.

1.3 FABRICATION

- A. Welded construction.
- B. Manufacture each access panel assembly as an integral unit ready for installation.
- C. Furnish with a sufficient quantity of 1/4 inch diameter mounting holes to secure access panels to types of supports indicated on Drawings.
- D. Furnish number of latches required to hold panel in flush, smooth plane when closed.

END OF SECTION

SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Overhead Door Corp., Products:
 - 1. Insulated: Stormtite 625 Series.
 - 2. Non-Insulated: Stormtite 620 series.
 - 3. Operator: RSX Series.
- B. Cookson Company.
- C. Cornell Iron Works, Inc.

1.2 MATERIALS

- A. Curtain:
 - 1. Slats: Interlocking, flat profile, 18 gauge galvanized steel front cover and 24 gauge galvanized steel back cover.
 - 2. Nominal Slat Size:
 - a. Insulated: 2-5/8 inches wide x required length x 3/4 inch deep, filled with 2.2 pound density foamed-in-place polyurethane foam having an R-Value of 7.7 and an STC Rating of 21.
 - b. Non-Insulated: 2-5/8 inches wide x required length x 5/8 inch deep.
 - 3. Curtain Bottom: Two – 1/8 inch thick galvanized steel angles bolted back-to-back with weather-stripping to provide curtain reinforcement and positive contact with floor when in closed position. Provide electric sensing edge.
 - 4. End locks shall be installed on alternate slats. Windlocks shall be provided as required to meet design wind load at the Project location.
- B. Guides: Three – 3/16 inch thick galvanized structural steel angles, continuous, with vinyl weather seal at each jamb, on the exterior curtain side.
- C. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance shall be adjustable by means of an adjusting tension wheel. Provide 100,000 cycle springs.
- D. Hood Enclosure: 24 gauge galvanized steel, internally reinforced to maintain rigidity and shape, weather-stripped. Provide internal hood baffle weatherseal.
- E. Brackets: Galvanized steel to support counterbalance, curtain and hood.
- F. Locking: Cylinder lock for electric operation with interlock switch.

1.3 MOTOR OPERATION

- A. Standards: Motor operator unit approved and listed by UL Electrical equipment conforming to NEMA Standards.

- B. Motor Operator Unit: Wall or bracket mounted in compact unit enclosed by metal housing, capable of moving curtain up or down at rate of not less than 2/3 foot per second nor more than one foot per second, consisting of motor connected to speed reducer, solenoid activated clutch brake, limit switch and emergency stop bar together with such controls as specified or required.
- C. Current Characteristics for Motor and Controls: To suit that available at door locations as shown on Electrical Drawings.
- D. Motor: One horsepower, 208V, three-phase, heavy duty, high starting torque, Class A insulated, hoist duty motor. Horsepower rating shall have large overload factor.
- E. Drive: Either direct motor connected or noiseless roller chain drive to speed reducing worm gear assembly submerged in oil bath. Sprocket and gears, steel with machine cut teeth, or high-strength gray cast iron with either machine cut teeth or machine molded from machine cut patterns. Bearings self-aligning precision ball bearings or permanently lubricated type.
- F. Starter: Magnetic, across-the-line starter with thermal overload, under-voltage protection and magnetic reversing contractor, key-operated switch with three positions marked "UP," "DOWN," and "STOP" or "OPEN," "CLOSE" and "OFF." Surface wall-mounted on interior of building with stainless steel faceplate.
- G. Limit Switch: Provide as needed to limit travel of curtain up and down. Timing shall not be affected when operation changes from motor to manual or when motor is removed.
- H. Safety Switch: Provide interlocking safety switch to shut off current to motor when curtain is being manually operated. Provide emergency stop edge at bottom bar extending across full width of door to automatically stop or reverse downward travel of curtain when contact is made with obstruction in opening.
- I. Emergency Operation: Provide endless galvanized chain within reach of floor and not more than 12 inches from wall, for manual operation in emergency. Manual operation shall be possible when motor is disconnected, or under any conditions that make power unit inoperable.

1.4 FINISHES

- A. Galvanized Steel: Slats, guides, and hood shall be galvanized in accordance with ASTM A653, and shall receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
 - 1. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
 - 2. Top Coat Color: Powder coat finish in color as selected by Architect from manufacturer's standard colors.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Kawneer North America, Norcross, GA; 770-449-5555, www.kawneer.com. Product: Trifab VG 451T storefront with Series 500 Wide Stile doors.
 - a. GLASSvent awning (project out) windows.
2. Oldcastle Building Envelope, Santa Monica, CA; 866-653-2278, www.oldcastlebe.com.
3. Arcadia Incorporated, Vernon, CA; 323-269-7300, www.arcadiainc.com.
4. EFCO Corporation, Monett, MO; 800-221-4169. www.efcocorp.com.

1.2 MATERIALS

- A. Extruded Aluminum: ASTM B221; 6063 alloy, T6 temper. Wall thickness shall provide structural strength to meet specified performance requirements.
- B. Sheet Aluminum: ASTM B209.
- C. Fasteners: Stainless steel.
- D. Perimeter Anchors: Stainless steel.
- E. Perimeter Clips: Steel with one coat of shop primer; refer to Section 05 50 00 for additional requirements.
 1. For aesthetic purposes, also coordinate locations and appearance of connections exposed to view with Architect.
 2. When perimeter clips are required, storefront manufacturer shall be responsible for sizing, providing, and installing all clips and associated fasteners. Clips and fasteners shall not be fabricated or installed until the Shop Drawings have received final acceptance from Architect.

1.3 DOORS

- A. Doors: Corner construction shall consist of mechanical clip fastening, SIGMA deep penetration and minimum 1-1/8 inch long fillet welds. Glazing stops shall be snap-in type with EPDM flashing gaskets. Bottom rail shall be minimum 10 inches high.
 1. Hardware: As specified in Section 08 71 00. Hardware shall be installed at the factory prior to shipment.
 2. Thresholds: Thresholds shall be one piece thresholds in a bed of mastic. Threshold shall set no higher than 1/2 inch from the lowest floor surface. When complete, threshold shall be accessible.
- B. Weather-strip: Door manufacturer's standard felt insert strip designed into door system along perimeter door edges.

1.4 OPERABLE WINDOWS

- A. ANSI/AAMA/NWDA 101/I.S.2 Rating: P-HC-70.
- B. Material: Aluminum, ASTM B221, G.S. 10A-T5; 6063-T5 alloy and temper.
- C. Total Frame Depth: 2-3/4 inches.
- D. Frame and Ventilator:
 - 1. Corner construction shall consist of a mitered corner joint with an internal clip, sealed and mechanically staked.
 - 2. Frame shall have a continuous primary weather seal of polyethylene clad urethane foam, the rainscreen weather stripping shall be dual durometer Santoprene. Each corner shall be neatly mitered.
 - 3. Shall be factory fabricated and assembled.
- E. Fasteners: 300 Series stainless steel.
- F. Hardware:
 - 1. Cast white bronze cam locking handle with pole ring.
 - 2. Concealed stainless steel four-bar hinges [with limit stop to restrict hinge travel and limit vent opening to 4 inches].
- G. Accessories:
 - 1. Aluminum-framed insect screen with standard wicket.
 - 2. 4 foot-6 inch long pole to operate cam handle. Provide one pole for each room where operable window is located.

1.5 ACCESSORIES

- A. Flashings and Closures: 0.050 inch thick aluminum, finish to match window wall system finish where exposed.
- B. Mullion Mate: Where framed partitions abut storefront systems, provide Mullion Mate closure as manufactured by Gordon Interior Specialties Division, Phone: 800-747-8954, or accepted equal. Mullion Mate finish shall match storefront system finish. Provide self-adhering neoprene gasketing at narrow faces of Mullion Mate. Where Mullion Mate abuts glass surfaces, notch closure around horizontal storefront system members for close fit to glass.

1.6 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials:
 - 1. Storefront System and Doors, and Operable Windows: 1 inch insulated glass units as specified in Section 08 81 00.
- B. Glazing gaskets and seals used for aluminum work shall be an integrated glazing system designed by the aluminum work manufacturer to produce a watertight assembly, and shall be physically and chemically compatible with each other and with adjacent materials.
 - 1. Neoprene and EPDM materials shall not come in contact with silicone sealant materials.

2. Gaskets shall be designed, when in final compression form, to be compressed a minimum of 25 percent and a maximum of 40 percent, and to exert a pressure of between four pounds and ten pounds pressure per linear inch.
 3. All side light and transom glass shall be set with the same type and size of glazing gasket material.
- C. Contractor shall provide and set lead blocking for all window systems installed. Each glass panel supplied shall display a factory mark certifying each glass panel is manufactured of tempered glass. Plate glass and laminated glass will not be acceptable.

1.7 SEALANT MATERIALS

- A. Sealant and Backing Materials: As specified in Section 07 92 00.

1.8 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof. Sealant will not be allowed at exposed joints.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement of 1/4 inch thick galvanized steel mounting backing plates for door hardware and hinge hardware as per ASTM A36.
- F. Exposed work shall be carefully matched to produce continuity of line, design and finish. Joints in exposed work, unless otherwise shown or required for thermal movement, shall be accurately fitted, rigidly secured with hairline contacts and sealed watertight.
- G. Removable members such as glass stops shall be extruded and securely engaged into adjacent components as indicated by product manufacturer.
- H. Face clearances between glass and stop shall comply with code requirements and glass manufacturer's recommendations.
- I. All fasteners shall be of sufficient strength to support both horizontal wind load and vertical dead load, with a Factor of Safety of 1.5. They shall be spaced and be sized to develop the maximum strength of the members they secure or support. Washers, where required, shall be of the same material as the fastener. Unless otherwise shown or approved, fastening systems shall be concealed.
- J. Install internal steel stiffeners within the window wall system as required to meet the windload/deflection requirements at the location of this project.
- K. Sealants, gaskets, setting blacks, tapes and separators, where used, shall be physically and chemically compatible with each other and with adjacent materials. Items shall be installed so that they will not become dislodged during or after assembly of units.

1.9 SPECIAL REQUIREMENTS

- A. Dissimilar Materials Protection: Use chromate gasketing to separate aluminum surfaces in contact with other metals, plaster or concrete, or heavy coat of alkali resistant bituminous paint. Aluminum need not be separated from stainless steel or galvanized steel.

1.10 FINISHES

- A. All aluminum extrusions shall have Architectural Class I finish per Aluminum Association Standard AA-M12 C22 A41, clear anodized or AA-M12 C22 A44, bronze or black anodized complying with AAMA 611, 0.7 mil minimum thickness, or
- B. All aluminum extrusions shall have a high performance fluorocarbon organic coating as follows:
 - 1. Comply with requirements of AAMA 2605.
 - 2. Surfaces shall be cleaned and given conversion coating pre-treatment prior to application of 0.3 mil dry film thickness of epoxy or acrylic primer following recommendations of finish coat manufacturer.
 - 3. Finish coat of 70 percent minimum fluorocarbon resin fused to primed surfaces at temperature recommended by manufacturer, 1.0 mil minimum dry film thickness.
 - 4. Acceptable Coatings: Trinar by Akzo Coatings, Inc.; Nubelar by Glidden Company; Fluoroceram by Morton International, Inc.; Duranar by PPG Industries Inc.; and Fluropon by Valspar Corporation.
 - 5. Provide finish in a four coat system.
 - 6. Color as selected by Architect.

END OF SECTION

SECTION 08 41 26

ALL-GLASS ENTRANCES AND STOREFRONTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. ACI Distribution, a Division of Vitro America, Inc.; Santa Fe Springs, CA; 800-606-4224, www.acidistribution.com.
2. Oldcastle Building Envelope.
3. Alpha Door & Rail, Inc.
4. Blumcraft of Pittsburgh.

1.2 MATERIALS

A. Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated surfaces), Type I (transparent), tested for surface and edge compression per ASTM C 1048 and for impact strength per 16 CFR 1201 for Category II materials.

1. Class 1: Clear, monolithic.
 - a. Thickness: As indicated on Drawings.
 - b. Locations: As indicated on Drawings.
2. Exposed Edges: Machine ground and flat polished.
3. Butt Edges: Flat ground.
4. Corner Edges: Lap-joint corners with exposed edges polished.

B. Extruded Aluminum: ASTM B221/B221M; 6063 alloy, T5 temper. Wall thickness shall provide structural strength to meet specified performance requirements.

C. Sheet Aluminum: ASTM B209.

D. Fasteners: Stainless steel.

E. Perimeter Anchors: Stainless steel or plated steel, providing the steel is properly isolated from the aluminum.

1.3 METAL COMPONENTS

A. Fitting Configuration:

1. Manual-Swinging, All-Glass Entrance Doors: Patch fittings at head and sill on pivot side, and for lock at sill of swing side.

B. Patch Fittings: Stainless-steel-clad aluminum.

C. Frame Header where auto operators are not utilized:

1. Basis-of-Design: DORMA RP Header Tubes:
 - a. [http://www.dorma.com/en/prod/content/view/full/35728/\(code\)/product_detail/\(parent\)/23562](http://www.dorma.com/en/prod/content/view/full/35728/(code)/product_detail/(parent)/23562)

- b. Profiles: 1-3/4 inches × 4-1/8 inches or 1-3/4 inches × 4-1/2 inches.
- D. Accessory Fittings: Match patch-fitting metal and finish for the following:
 - 1. Overhead doorstop.
 - 2. Center-housing lock.
 - 3. Glass-support-fin brackets.
- E. Anchors and Fastening: Concealed.
- F. Weather Stripping: Pile type; replaceable without removing all-glass entrance doors from pivots.

1.4 ENTRANCE DOOR HARDWARE

- A. General: Heavy-duty hardware units in sizes, quantities, and types recommended by manufacturer for all-glass entrances indicated. For exposed parts, match fitting metal and finish.
- B. Concealed Floor Closers:
 - 1. Manufacturers:
 - a. Dorma Manufacturing.
 - b. Rixson Manufacturing.
 - 2. Types: Provide Concealed Floor Closers and Top Pivots: Center hung; BHMA A156.4, Grade 1; including cases, bottom arms, top walking beam pivots, plates, and accessories required for complete installation.
 - 3. Provide Pivot Pendulum Locator by approved manufacturer.
 - 4. Swing: Single acting.
 - a. Positive Dead Stop: Coordinated with hold-open angle, if any, or at angle selected.
 - b. Provide delayed action feature. Mechanical back-check begins at about 70 degrees.
 - 5. Opening-Force Requirements:
 - a. Egress Doors: Not more than five pounds.
- C. Center Floor Pivots:
 - 1. Manufacturers:
 - a. Dorma Manufacturing.
 - b. Rixson Manufacturing.
 - 2. Types: Provide Center hung pivot for sufficient weight of door and for coordination with Horton 4000LE concealed auto operator; Grade 1; including accessories required for complete installation.
 - 3. Provide Pivot Pendulum Locator by approved manufacturer.
- D. Concealed Automatic Operators:
 - 1. Manufacturers:
 - a. Concealed Horton 4000LE Series.
 - 2. Provide complete with installation plates, brackets, or adapters for arms as required to suit details.

3. Capacity: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
4. Adjustment Features: Operators shall be fully adjustable. Provide adjustment for opening, closing, and checking speeds, as well as length of time door remains open.
5. Door Operator: Selectively activated by external initiating device (i.e. card reader or wall switch).
6. Door operator shall have input line rating of 120VAC, 0.6A. Units shall have relay contact for interfacing products having a rating of 30VDC at 1A or 125VAC at 0.5A. Unit shall have an external On/Off Switch to defeat powered opening when desired. Unit shall have an internal circuit breaker switch to interrupt input power for servicing. Unit shall be U.L. Listed for automatic closing door. Unit shall be in compliance with the requirements of the Americans with Disabilities Act (ADA), CBC Chapter 11B, and ANSI standards A117.1 and A156.19. Unit shall meet C-UL US.

E. Pull Handles:

1. As specified in hardware set below.

F. Manufacturers Legend:

<u>Code</u>	<u>Name</u>
DO	Dorma
RO	Rockwood
HO	Horton Automatics
WI	Wikk
TR	Trimco

G. Hardware Columns - Example (Legend):

<u>Qty</u>	<u>Device Description</u>	<u>Device Part # (Include 08450 Language)</u>	<u>Finish</u>	<u>Manuf.</u>
1	-----	-----	--	--

- H. Hardware Schedule: The following hardware sets are intended to establish type and standard of quality when used together with the requirements of this Section. Examine Contract Documents and furnish proper hardware for door openings.

SET #XXX

2	Center Hung Pivots	CPA440 BOTTOM PIVOT (or AS REQUIRED BY HORTON 4000LE)	619	DM
4	Door Pull	RM2210 72" MP TYPE 5 FASTENING (or CONCEALED FASTENING AS REQUIRED)	630	RO
2	Concealed Low Energy Operator	4000LE	628	HO
2	Operator Actuator	4 x 4-3 (CONCEALED MTG) PER SPECIFICATIONS	630	WI
2	Floor Stop	7281	619	TR
1	Dedicated 120V Power	BY ELECTRICAL - DIV 28 OR 16 (AS REQUIRED)		

NOTE: Provide wall mounted actuators as shown on drawings that are computable with Horton 4000LE devices. Basis of design Wikk Manufacturing (www.wikk.com) devices series per specification x 630 stainless steel finish. Actuators shall be weather-resistant type at all applications. Provide complete installation brackets or adapters for automatic operator actuators to suit details.

SET #XXX

2	Floor Closer x Top Pivot	BTS 80 SERIES x ADA 5 POUND OPENING FORCE	619	DM
4	Door Pull	RM2210 72" MP TYPE 5 FASTENING (or CONCEALED FASTENING AS REQUIRED)	630	RO
2	Concealed Overhead Stop	1ADJ SERIES (-336 or SIZE AS REQUIRED)	630	RX
2	Applied Stops	60131 SERIES		RX

1.5 SEALANT MATERIALS

A. Sealants and Backing Materials: As specified in Section 07 92 00.

1.6 FABRICATION

A. Glass and Glazing Materials: As specified in Section 08 81 00.

B. Provide holes and cutouts in glass to receive hardware, fittings, and accessory fittings before tempering glass. Do not cut, drill, or make other alterations to glass after tempering.

C. Fully temper glass using horizontal (roller-hearth) process, and fabricate so that when glass is installed, roll-wave distortion is parallel with bottom edge of door or lite.

1.7 SPECIAL REQUIREMENTS

A. Dissimilar Materials Protection: Use chromate gasketing to separate aluminum surfaces in contact with other metals, plaster, and concrete, or apply a heavy coat of alkali resistant bituminous paint. Aluminum need not be separated from stainless steel or galvanized steel.

1.8 FINISHES

A. All aluminum extrusions shall have Architectural Class I finish per Aluminum Association Standard AA-M12 C22 A41, clear anodized or AA-M12 C22 A44, bronze or black anodized, complying with AAMA 611, 0.7 mil minimum thickness, or.

B. All aluminum extrusions shall have a high performance fluorocarbon organic coating as follows:

1. Comply with requirements of AAMA 2605.

2. Surfaces shall be cleaned and given conversion coating pre-treatment prior to application of 0.3 mil dry film thickness of epoxy or acrylic primer following recommendations of finish coat manufacturer.
3. Finish coat of 70 percent minimum fluorocarbon resin fused to primed surfaces at temperature recommended by manufacturer, 1.0 mil minimum dry film thickness.
4. Acceptable Coatings: Trinar by Akzo Coatings, Inc.; Nubelar by Glidden Company; Fluoroceram by Morton International, Inc.; Duranar by PPG Industries Inc.; and Fluropon by Valspar Corporation.
5. Provide finish in a four coat system.
6. Color as selected by Architect.

END OF SECTION

SECTION 08 56 19

PASS WINDOWS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. C. R. Laurence Co., Inc., Los Angeles, CA; 800-421-6144, www.crlaurence.com. Products:
 - 1. Standard Inset Type Window.
 - 2. Speak-Through Model No. N666.
 - 3. 18 inch stainless steel shelf with Deal Tray, Model #SSDT4018.
- B. Chicago Bullet Proof Systems.
- C. Nissen & Company.

1.2 MATERIALS

- A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper.
- B. Sheet Aluminum: ASTM B209 alloy, T5 temper.
- C. Fasteners: Stainless steel.

1.3 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08 81 00.

1.4 SEALANT MATERIALS

- A. Sealant and Backing Materials: As specified in Section 07 92 00.

1.5 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to ensure concealment from view.

1.6 FINISHES

- A. All aluminum extrusions shall have Architectural Class II finish per Aluminum Association Standard AA-M12 C22 A31. Color shall be satin anodized.
- B. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

END OF SECTION

SECTION 08 62 00

UNIT SKYLIGHTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Sunoptics Prismatic Skylights. Products:
 - 1. Skylight Unit: Frame Model 800MD, curb mounted.
 - a. ATI Evaluation Service Code Compliance Research Report Number CCRR-0113.
 - b. AAMA Certified Products Report Number 95749.01-301-44.
 - c. NFRC Simulation Report Number A2457.01-301-45.
 - 2. Light Control Louver: Frame Model 900.
 - 3. Insulated curb with integral safety grid: Model ARC-3.
- B. Bristolite Daylighting Systems.
- C. O'Keeffe's Skylights.
- D. Lane-Aire Manufacturing Corporation.

1.2 SKYLIGHT

- A. Dome Shape: Pyramid or Double Hip.
- B. Glazing: Double glazed using 50 CC2 50 percent Impact Modified acrylic clear prismatic outer lens over 50 CC2 50 percent Impact Modified acrylic white inner lens, air sealed.
 - 1. Solar Heat Gain Coefficient: 0.42.
 - 2. U Value: 0.74.
 - 3. Visible Light Transmission: 0.68.
- C. Frame: Skylight frames shall be fabricated from 6063-T5 aluminum, finish as selected by Architect. Frames shall have integral condensation and weepage gutters which drain interior moisture to the outside. Corners shall be mitered and welded. Skylight frames shall be insulated and thermally broken. The acrylic glazing shall be separated from the skylight frame with an EPDM rubber air seal gasket.

1.3 ACCESSORIES

- A. Anchorage Devices: Type recommended by manufacturer.
- B. Counter-flashings: Same metal type and finish as roof flashing metal.
- C. Protective Back Coating: Bituminous.
- D. Sealant: As specified in Section 07 92 00.

1.4 LIGHT CONTROL LOUVERS

- A. Light control louvers and frames shall be fabricated from 6063-T6 aluminum, finished with baked enamel paint system, color as selected by Architect.

- B. Louvers shall be factory assembled, ready for installation.
- C. Louver frames shall be mechanically joined at corners. Blades shall be 6 inches on center, rotating a minimum of 90 degrees on a 5/8 inch rigid PVC bearing. Aluminum end plates shall be fastened to the ends of each blade and act as thrust caps against the PVC bearing. End plates shall be attached to an aluminum bar on one side for gang operation.
- D. Louvers shall be electrically operated using manufacturer's standard synchronous 115VAC, 60hz, 7 watt motor unit. The exterior motor unit shall be integral to the louver assembly and shall be equipped with limit switches at the full open and closed positions.
- E. Louvers shall be provided by same manufacturer as skylight units and shall be compatible with skylights.

1.5 INSULATED CURB

- A. Premanufactured insulated curb shall be fabricated from galvanized steel with rigid insulation, integral safety grid, and wood nailer for attachment of skylight frame; all welded construction.
 - 1. Exterior Wall: 18 gauge galvanized steel, mill finish.
 - 2. Interior Wall: 20 gauge galvanized steel, white paint finish.
 - 3. Insulation: 1-1/2 inch rigid foam insulation. Insulation shall be full height and continuous around exterior perimeter of curb with no voids or gaps.
 - 4. Safety Grid: 0.162-inch diameter cold-rolled galvanized steel wire mesh with 75,000 PSI tensile strength, welded at 4 inches on center each direction. Grid shall be attached to curb framing with mechanical fasteners.
 - 5. Wood Nailers: 2 x 2 pressure treated nailer continuous around and fastened to curb top.
 - 6. Top of curb shall be level. Fabricate bottom of curb to match roof slope.

1.6 FABRICATION

- A. Fabricate in accordance with manufacturer recommendations free of visual distortion and defects.
- B. Provide for removal of condensation.
- C. Provide weathertight assembly.
- D. Fabricate to drain water entering joints, or migrating moisture occurring within unit, to exterior.
- E. Factory-fabricate and preassemble in largest size assembly consistent with economic considerations for shipping to and handling at the job site.

END OF SECTION

SECTION 08 62 23
TUBULAR SKYLIGHTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Basis-of-Design: Solatube International, Inc., Products:

1. SolaMaster Series 21 inch Solatube Model 750 DS-C Daylighting System.
 - a. ATI Evaluation Service Code Compliance Research Report Number CCRR-0131.

B. No known equal.

1.2 TUBULAR SKYLIGHT ASSEMBLIES

A. General: Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICC AC-16.

1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
 - a. Outer Dome Glazing: Type DA, 0.125 inch minimum thickness injection molded acrylic classified as CC2 material; UV inhibited, impact modified acrylic blend.
2. Raybender 3000: Variable prism optic molded into outer dome to capture low angle sunlight and limit high angle sunlight.
3. Roof Flashing Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
 - a. Base Material: Sheet steel, corrosion resistant conforming to ASTM A653/A653M or ASTM A463/A463M, 0.028 inch thick.
 - 1) Base Style: Type FC curb cap with inside dimensions of 27 inches by 27 inches to cover base curb.
 - 2) Dome Edge Protection Band: Type PB. Galvanized steel; nominal thickness of 0.039 inches.
4. Curb: Model RPC-3 as manufactured by Roof Products, Inc. with the following characteristics:
 - a. Frame Material: 18 gauge ASTM A653 G90 hot-dipped galvanized steel.
 - b. Corners: Mitered and welded with welds sealed and prime painted after fabrication.
 - c. Mounting Flange: 2 inches wide, integral to frame, and welded.
 - d. Wood Nailers: Factory installed, 2 x 4 pressure treated, continuous around top perimeter of frame.
 - e. Insulation: Factory installed 1-1/2 inch thick three pound density fiberglass insulation continuous around inside of frame.
 - f. Size and Height: As indicated on Drawings.
5. Tube Ring: Attached to top of base section; 0.090 inch nominal thickness injection molded high impact PVC to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.

6. Dome Seal: Adhesive backed weatherstrip 0.63 inch tall by 0.28 inch.
7. Reflective Tubes: Aluminum sheet, thickness 0.018 inch.
 - a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface. Specular reflectance for visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum reflectance (400 nm to 2500 nm) not less than 93 percent.
 - b. Color: a^* and b^* (defined by CIE L a^*b^* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E308.
 - c. Top Tube Angle Adapter and Bottom Tube Angle Adapter Kit, Type AK; reflective thirty degree adjustable top and bottom angle adapters (one each) 16 inches long.
 - d. Extension Tubes:
 - 1) Type EXX; Reflective extension tube, notched for open ceiling diffuser attachment, 24 inches long.
 - 2) Reflective Ninety Degree Adjustable Tube: Provide manufacturer's standard extension tube angle adapters for applications requiring two Type A2 0 to ninety degree extension tube angle adapters.
 - e. Diffuser Assemblies for Tubes Penetrating Ceilings:
 - 1) Ceiling mounted box transitioning from round tube to square ceiling assembly, supporting light transmitting surface at bottom termination of tube; 23.8 inches by 23.8 inches square frame.
 - 2) Box shall be fabricated of opaque polymeric material, classified as CC2, Class C, 0.110 inch thick.
 - f. Natural Effect Lens: Acrylic, classified as CC2, Class C, 0.060 inch thick, with open cell foam seal to minimize condensation and bug, dirt, and air-infiltration per ASTM E283.
 - g. Lens: Optiview Fresnel lens, Classified as CC2, designed to maximize light output and diffusion with extruded aluminum frame. Visible Light Transmission shall be greater than ninety percent at 0.022 inch thick.
8. Accessories:
 - a. Thermal Insulation Panel
 - b. Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 Hz or 60 Hz; maximum current draw of 50 ma per unit; controlled by low voltage, series Type T02: circuited, four conductor, size 22 cable; providing daylight output between 2 percent and 100 percent. Provide with dimmer switch and cable.
 - 1) Local Dimmer Control: Provide with dimmer switch and cable.
 - a) Switch: Type SW, Manufacturer-specific 24 VDC DP/DT switch (white) required to operate Daylight Dimmer.
 - b) Cable: Type CA, Two conductor low voltage cable (500 feet) for multiple unit DC connection.
 - c. Security Bars: Type B, 0.375 inch stainless steel bars across flashing diameter opening.
 - d. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required.

1.3 ACCESSORIES

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer.
- B. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- C. Sealant: Polyurethane or copolymer based elastomeric sealant as recommended by manufacturer.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 PRODUCTS

1.1 HANGING HARDWARE

A. Gate Hanging Devices:

1. Ornamental and Steel Gate Self-Closing Hinges:
 - a. Acceptable Manufacturers:
 - 1) Locinox Manufacturing (no known equal).
 - b. Mammoth 180-Degree Hydraulic Closers/Hinges Set.
 - c. Heavy duty full surface mounted hinge and vertical built-in closer not exceed 5 pounds opening force.
2. Chain Link Gate Self-Closing Hinges:
 - a. Acceptable Manufacturers:
 - 1) DandD Technologies Manufacturing.
 - b. Heavy duty full surface mounted hinge and vertical built-in closer not exceed 5 pounds opening force.
3. High Capacity Precision Engineered (heavy duty) hinges:
 - a. CBI-8500 series hinges by Crown Industrial, South San Francisco, CA; (650) 952-5150; <http://www.crown-industrial.com/>, or accepted equal.
 - b. Provide additional number of offset hinge devices to meet hinge manufacturer device warranty and gate warranty.
 - c. Confirm hinge sizing with frame details. All doors shall swing 180 degrees if opening will allow. Provide wide throw hinges where required (provide widths sufficient to clear trim projection when door swings 180 degrees).
 - d. Provide non-removable pins.
4. Gate hinges shall be mounted and welded in accordance with manufacturer's recommendations.
 - a. Coordinate with welding requirements in Contact Documents.
 - b. Provide devices ground smooth and painted to match gate/fence system – see Division 09 for paint and primer requirements.
5. Products by the following manufacturers will be considered for acceptance providing all specified criteria have been met in full. Furnish all items and components of hardware required to complete the work in accordance with specifications, Contract Documents, and intended operation.
 - a. Ameristar.
 - b. Monumental Iron Works.

B. Butt Hinges and Self-Closing Hinges:

1. Acceptable Manufacturers:
 - a. Hager Manufacturing.
 - b. McKinney Products Co.
 - c. Ives Manufacturing by Allegion.
 - d. Bommer Manufacturing.
 - e. Stanley Works.

C. Continuous Hinges:

1. Acceptable Manufacturers:
 - a. Select Hinges.
 - b. Markar Manufacturing.
 - c. Ives Manufacturing by Allegion.
 - d. Pemko Manufacturing.
 - e. McKinney Products Co.
 - f. Stanley Works.

D. Floor Closers and Intermediate Pivots:

1. Acceptable Manufacturer and Device:
 - a. CRL/Jackson Manufacturing.
2. Products by the following manufacturers will be considered for approval providing floor closer can be adjusted in the field without special tools by building maintenance personnel. Furnish maintenance materials and written letter existing buildings where Rixson or Dorma devices have successfully been maintained and adjusted from 5 pounds to 10 pounds without outside maintenance help. Provide at least two names and contact phone number information.
 - a. Rixson Manufacturing (adjustable in field only per above).
 - b. Dorma Manufacturing (adjustable in field only per above).

E. Floor Pivots and Intermediate Pivots:

1. Acceptable Manufacturers:
 - a. Rixson Manufacturing.
 - b. Dor-O-Matic Manufacturing.
 - c. Dorma Manufacturing.
 - d. Ives Manufacturing.

1.2 SECURING DEVICES (LATCHING SYSTEMS)

A. Mortise Locksets, Latchsets, and Deadbolts:

1. Acceptable Manufacturers:
 - a. Schlage Lock Co. L9000 Series.
2. Levers:
 - a. Provide levers to return to door within 1/2 inch.
 - b. Lever Style: Traditional Square Style, verify with Client if alternate levers are acceptable.
 - c. Provide exterior side lever trim with vandal resistant feature (heavy duty lever trim designed to withstand abuse and vandalism):
 - 1) Schlage L9000 series Vandlgard™. Vandlgard example nomenclature: Storeroom Lockset LV9080 (added "V" nomenclature after the "L" nomenclature for lockset to have increased strength against abuse or vandalism) Locked lever freely rotates up and down while remaining securely locked. Provide seven-year warranty.
3. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on Drawings and detailed requirements for each type of device:
 - a. Locksets shall meet the requirements of ANSI/BHMA A156.13-1994, Operational Grade 1.
 - b. Provide only thumbturn devices that meet accessibility requirements. Example: Schlage #L283-722 devices. No center pivoting thumbturns allowed.
 - c. If deadbolts or lockbolts are utilized on the project, devices shall be interconnected with the latching mechanism on all egress doors to provide single movement function to unlatch doors.
 - d. Backset: 2-3/4 inches. Provide minimum 1 inch throw stainless steel deadbolt Provide minimum 3/4 inch throw for latch bolt.

B. Cylindrical Locksets and Latchsets:

1. Acceptable Manufacturers:
 - a. Schlage Lock Co. ND Series.
2. Levers:
 - a. Provide levers to return to door within 1/2 inch.
 - b. Lever Style: Traditional Square Style, verify with Client if alternate levers are acceptable.
 - 1) Provide exterior side lever trim with vandal resistant feature. Locked exterior lever freely rotates withstanding abuse and vandalism while remaining securely locked. Example: Schlage ND series Vandlgard™.
3. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on Drawings and detailed requirements for each type of device:
 - a. Cylindrical locksets shall be a BHMA Certified Product, meeting requirements per ANSI A156.2, 1996.
 - b. Backsets: 2-3/4 inches.

C. Exit Devices and Removable Mullions:

1. Acceptable Manufacturers:
 - a. Von Duprin.
2. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on Drawings and detailed requirements for each type of device:
 - a. Exit devices shall be ANSI A156.3, Grade 1; UL Listed.
 - b. All exit devices shall be UL listed for panic. Exit devices for labeled doors shall be UL listed as "Fire Exit Hardware".
 - c. Provide cylinders for exit devices with locking trim and cylinder dogging. Provide cylinder dogging feature for non-rated exit devices.
 - d. Trim:
 - 1) Where lever trim is specified, provide lever design to match lockset levers.
 - 2) Provide exit device lever trim with vandal resistant feature (heavy duty lever trim designed to with stand abuse and vandalism):
 - a) Von Duprin 996 R/V.
 - e. The unlatching force of panic hardware shall not exceed 5 pounds, applied in the direction of travel, certified by UL to meet requirements of CBC Section 11B-309.4 (Von Duprin nomenclature "AX").
 - f. All exit devices shall be shipped to project site with exit device, isometric cap as to not catch items on panic device push bar (Von Duprin nomenclature "PA").
 - g. Where removable mullions are not specified in hardware groups, provide keyed removable mullions at all locations in order for door to properly latch and secure rooms and buildings with rim or mortise type exit/panic bar devices.
 - 1) Provide stabilizers for removable mullions at all locations.
 - h. Whether or not specified throughout project, verify if Electrical, IDF and other rooms with electrical coordination have 800 amps or more than 800 amps housed within the rooms. At these rooms, if lever locksets are specified, credit the locking device and provide the Von Duprin mortise-type panic device #9975NL-F x 996L-M x key override.

D. L-Shape Exit Devices, Typical Glass - Egress Out Swinging Doors:

1. Manufacturers:
 - a. Basis-of-Design: C.R. Laurence/Blumcraft.
 - b. Dorma manufacturing
2. Provide PA100 Series Egress, L-shaped exit bar x typically type "F" full height pull or as scheduled.
3. Provide locking trim / cylinder dogging features with free egress at all times.
4. Provide cylinders for exit devices with locking trim / cylinder dogging.

E. Electric Strikes:

1. Acceptable Manufacturer:
 - a. Basis-of-Design: HES Manufacturing, Inc.
 - b. Acceptable Manufacturers, if meeting specifications below:
 - 1) Folger-Adam Manufacturing, Inc.
 - 2) SDC.
 - 3) Adams Rite.
 - 4) Von Duprin.
2. Specifications shall meet ANSI/BHMA 156.31, Grade 1; UL 1034, burglary-resistant listed; ANSI A250.13-2003 listed; UL 10C, 3 hour fire-rated (fail secure only); NFPA 252 fire door conformant; ASTM E152 fire door conformant. Provide dual interlocking plunger design and heavy-duty, all stainless steel construction, tested to exceed 3,000 pounds of static strength, 350 foot pounds of dynamic strength, and factory tested to exceed 1,000,000 cycles of operation.
3. Provide electric strikes designed for use with the type locks shown at each opening where specified.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.
5. For all electric strike locations, provide HES "SmartPac III" In-Line Power Control or accepted equal product to meet specified requirements: 2005 SmartPac III device is an in-line power control that is capable of receiving input voltages from 12VAC to 32VAC or DC. The built-in bridge rectifier shall provide 12VDC or 24VDC output. Under continuous duty operation, the output VDC shall be reduced by 25 percent to extend the life of the electric strike. The SmartPac III shall include an in-line fuse, MOV to protect against possible inrush and reverse surges, and a 2 second to 8 second adjustable timer. Standard features include selectable 12VDC or 24VDC output options, built-in bridge rectifier, built-in surge protection / voltage regulation, activation timer keeping strike energized for set period of time, adjustable from 2 seconds to 8 seconds, continuous duty timer reducing initial voltage by 25 percent after set period of time adjustable from 2 seconds to 8 seconds, providing cooler operation of strike.

1.3 CABINET AND DRAWER LOCKS

- A. Provide locking devices for all project cabinets and locking drawers within the project. Provide Schlage interchangeable core/cylinder Classic E keyway series cores and keying system per below. Section 08 71 00 Vendor furnished/installed in cabinets and locking drawers. Owner locksmith to perform final keying per below.
- B. Acceptable Manufacturers:
 - a. Schlage Lock Co.
 - b. Olympus Lock Co.

C. Furnish cabinets and locking drawers in the following quantities:

- a. 200 each = Cabinet Door Lock - CL777R. Include final core and keying per key systems below.
 - b. 200 each = Drawer Lock - CL888R. Include final core and keying per key systems below.
 - c. 200 each = Cam Lock - CL920R. Include final core and keying per key systems below.
2. Coordinate with project cabinets and locking drawer Vendor for required quantity and types and credit un-used cabinet/locking drawer devices. Ship required and quantity directly to cabinet/locking drawer Vendor.

1.4 KEY SYSTEMS (CYLINDERS, CORES AND KEYS.)

A. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on drawings and detailed requirements for each type of device. Keying specifications below override hardware set/group nomenclature.

B. For all locking or dogging devices, provide complete cylinder system and coordination whether or not specified in Section 08 71 00, Part 3 hardware sets as required by locking device.

1. Different locking devices require a set of different requirements including, but not limited to, appropriate cams for mortise-type cylinders, appropriate tail pieces and size for rim-type cylinders, blocking rings as required for locking and cylinder devices to not rattle and meet manufacturers' warranties, as well as cylinders that are to be coordinated with construction cores/cylinders and final pinned cores/cylinders shipped to Owner by Registered Mail per below to meet system requirements.
2. This scope is means and method type work by a certified locksmith and/or DHI individual to engineer rim or mortise cylinders and components as required by submitted locking devices. Since there could be as many as 500 options for rim or mortise cylinders with the locking devices and different manufactures that may be submitted, this means and method type work is required (similar to templating doors and frames to accept hardware). Coordinate as required.

C. Re-Key Existing Doors:

1. Re-key all existing doors. Examine existing openings/doors and during submittal provide plan for re-keying existing hardware to match new keying system (per the below and specified in hardware set/groups in Part 3).
2. Provide hardware necessary for completion of the work.

D. Key Systems (Cylinders, Cores and Keys):

1. Manufacturers:
 - a. Schlage Lock Co.
2. For all locking or dogging devices, provide complete keying system whether or not specified in Section 08 71 00, Part 3 hardware sets including lock cores, mortise cylinders, and rim cylinders keyed as directed by Owner in submittal process. Key System shall be:
 - a. Patented Schlage Lock Co. Primus Level 3.
3. Keyway: Provide as instructed by Owner during submittal process.

E. Keying Requirements:

1. Provide keyed, construction cores and keys during the construction period.
 - a. Provide full sized cylinders or brass construction cores and brass keys at all interior and exterior doors. Plastic cores are not permitted.
 - b. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway or key section as the Owner's permanent keying system. Permanent cores and keys prepared according to the accepted keying schedule shall be furnished to the Owner.
2. Keying Meeting and Programming Schedule:
 - a. After hardware has been submitted and reviewed in accordance with Division 01 requirements and Section 08 71 00, arrange a keying matrix/programming meeting with Owner and hardware supplier/Vendor representing the Schlage Restricted Keyway system.
 - 1) Copies of the reviewed door and frame submittals shall be brought to the meeting with card reader and keyed doors highlighted for review.
 - 2) Follow procedures for keying meeting and programming schedule as outlined by the Door Hardware Institute. DHI procedures are based on example Door Hardware Institute core class entitled Masterkeying class #AHC200.
 - b. Keying meeting to produce a programming schedule/matrix based on the following:
 - 1) Furnish keys in the following quantities (total quantity of keys part of bid package):
 - a) 5 each Grand master-keys per set.
 - b) 6 each Masterkeys per set.
 - c) 3 each Change keys each lock, core or cylinder.
 - d) 5 each Permanent Extractor keys.
 - e) 9 each Construction masterkeys.
 - f) 2 each Construction Core Extractor keys.
 - 2) Provide keying system expansion parameters.
 - a) Plan twenty changes directly under the grand.
 - b) Plan ten master keys.
 - c) Plan fifty changes each for each master.

- 3) Permanent keys and cores shall be stamped with the applicable key mark for identification. The visual key control marks or codes shall not include the actual key cuts.
- 4) Permanent keys shall be stamped "Do Not Duplicate".
- c. Furnish meeting notes and three complete, typed copies of keying and programming schedule to Owner for final review.
- d. Furnish keying and programming schedule to Schlage manufacturing factory for production of cores, cylinders and other keyed devices.
3. Transmit pinned cores/cylinders as well as cut grand masterkeys, masterkeys, change keys, and other security keys to Owner by Registered Mail, return receipt requested.
4. Install permanent cores in presence of Owner.

F. Fire Control Key Boxes:

1. Product: Rapid Entry System.
2. Manufacturer and Product: Basis-of-Design: Knox Box 3200 Series x The Knox Co.
3. Recessed mount, UL-listed, heavy-duty unit; fabricate from 1/4-inch-thick steel plate.
4. Provide with restricted keying as required by Local Fire Department.
5. Provide one box at each main entry from each parking area designated with a fire emergency lane.

G. Key Cabinets:

1. Manufacturer:
 - a. Basis-of-Design: Lund Deluxe wall type cabinet, Series 1200.
2. Acceptable Manufacturers, if meeting specifications below:
 - a. Telkee Incorporated.
 - b. Key Control Manufacturing.
3. Provide cabinet with one hook for each lock or cylinder plus at least 50 percent extra hooks.
4. Provide each hook with one non-removable security key tag and one snap-on link duplicate key tag.
5. Provide tools, instruction sheets, and accessories required to complete installation.
6. Owner will place keys in key cabinet and complete index cards furnished with key system.

1.5 CLOSING DEVICE

A. Surface Mounted Closers:

1. Acceptable Manufacturers:
 - a. LCN Manufacturing – 4045 Series.
 - b. Norton Door Controls – 7500 Series or 2800ST Series.

B. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on Drawings and detailed requirements for each type of device:

1. ANSI A156.4, Grade 1; UL Listed; meets UL 10C and SFM Standard 12-7-4 for positive pressure fire test.
2. ANSI A156.4, Grade 1; UL Listed; meets UL 10C and SFM Standard 12-7-4 for positive pressure fire test. Whether or not specified in hardware groups/sets, submit 4040XP or approved equal closer at all openings that are smoke-rated or fire-rated even if closer is omitted from groups/sets.
3. Closers shall have multi-size spring power adjustment to permit setting of spring from 1 through 6 with additional spring power available. Provide ADA compliant setting nomenclature during submittals as recommended by closer manufacturer.
4. Submit correct closer type as to be able to install closers on non-public side of doors (examples include but are not limited to 1) interior side of storage/electrical type rooms; 2) not in corridors/public areas 3) stair side of stairway doors; and at exterior locations, install closers inside of building (in conditioned spaces)).
5. Installation Plates, Brackets, and Miscellaneous Adapters:
 - a. Existing Closer Covers: At door/opening locations where closer cover is missing, provide new closer cover.
 - b. Provide drop plates, brackets, or adapters for arms as required to suit details and install as directed by manufacturer's templates.
 - 1) Furnish and install drop plates at reverse bevel doors and at doors with 170 degrees to 180 degrees swing.
 - 2) Furnish and install blade, angle or applied stops as required where frame does not permit installation of the standard soffit plate (see example below, field verify brackets and shims required before submittals, provide written language in submittals for how areas requiring special brackets).

C. Concealed Door Closers:

1. ADA series, concealed closer by CR Laurence manufacturing or accepted equal that can meet the 5 pound open and closing requirements per the snippet below. Verify architectural details for center hung application. Verify frame stop for doors to not swing back into rooms (single swing application).
2. Provide arms and templating for maximum swing of door.
3. Opening force not to exceed 5 pounds.

1.6 AUTOMATIC OPERATORS

A. See Section 08 71 13.

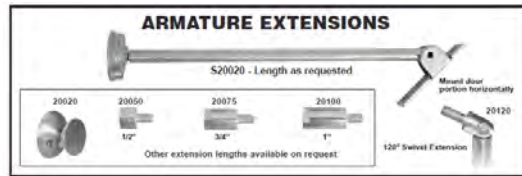
1.7 STOPS AND HOLDERS

A. Overhead Door Holder/Stops:

1. Acceptable Manufacturers:
 - a. Rixson Manufacturing.
 - b. ABH Manufacturing.
 - c. Glynn Johnson.

2. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on Drawings and detailed requirements for each type of device.
 - a. Overhead Stops and/or Holders shall meet the requirements of BHMA A156.8, Type 1, Grade 1.
 - b. If overhead stops are specified in hardware groups/sets, do not provide wall or floor stops as alternative method of stopping door.
 - c. If manual overhead “stop and hold-open” type devices are specified on fire-rated doors, provide the non-hold open function at time of submittals. Manual hold opens not allowed on fire rated doors.
- B. Floor and Wall Door Stops/Holders and Bumpers:
1. Acceptable Manufacturers:
 - a. Ives Manufacturing.
 - b. Triangle Brass Manufacturing Company, Inc. (Trimco).
 - c. Rockwood.
 - d. Hager Manufacturing.
- C. Magnetic Door Holders:
1. Acceptable Manufacturers:
 - a. ABH Manufacturing.
 - b. LCN Manufacturing.
 - c. RSG Manufacturing
 - d. Rixson Manufacturing.
 2. Install using concealed fasteners. No through bolts or SNB devices allowed.
 3. Coordinate with specifications in Division 05, 06, and/or 09 for required wall backing.
 4. Coordinate with Divisions 25-28 for electrical work.
 - a. Description of Operation: When door is placed in opened position, magnetic holder shall automatically engage hold open mechanism (magnet).
 - b. Door releases hold open and fully closes door by manual pulling of door or by the following, self-closing functions: 1) Close on fire alarm activation. Verify voltage and coordinate integration with fire alarm system; or 2) Close due to loss of power. Coordinate integration with local power system.
 5. At all locations utilizing hold open magnetic devices provide correct armature length for doors (example of armature lengths in snippet/picture below).
 - a. Where doors will open 90 degrees or 180 degrees, swing parallel or against adjacent wall provide length required to make door 90 degree or 180 degree preferred in open position.
 - b. At conditions where doors open between 90 degrees and 180 degrees, provide armature arm application and length so that door will reach wall condition and hold doors open until fire or other alarms drop power and close doors automatically.

- c. Hinge and closer coordination is required for doors that swing more than 90 degrees. Provide wide throw type hinges to clear all frame or wall obstructions in order for doors to fully open and to hide closer behind door when door are flat against a wall.



1.8 ACCESSORIES

A. Kick/Mop Plates:

1. Acceptable Manufacturers:

- a. Triangle Brass Manufacturing Company, Inc. (Trimco).
- b. Ives Manufacturing.
- c. Rockwood.
- d. Hager Manufacturing.

B. Where hardware groups/sets have different information, refer to the following for clarification. Provide hardware groups/sets devices along with added devices as indicated on Drawings and detailed requirements for each type of device

1. Coordinate length & sizes for hardware devices before ordering materials (verify the door hardware is compatible for use with the doors & door/frames). Protection plate example: LDW nomenclature in Part 3 means "less door width". A 48" wide door would have a 46" protection plate. Width shall be one inch less than door width unless doors have protective edge guards or center mullions. Coordinate before submittals.
2. At rated doors (UL smoke or fire), furnish protection plates with engraved UL listing information. Example: Trimco added part #ULS added to all kickplates specified below that are on UL or rated doors/openings.

C. Push/Pull Plates:

1. Acceptable manufacturers.

- a. Trimco Manufacturing.
- b. Ives Manufacturing.
- c. Rockwood.
- d. Hager Manufacturing.

D. Lock Guards:

1. Acceptable Manufacturers:

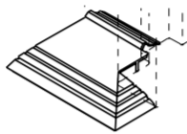
- a. Ives Manufacturing.
- b. Triangle Brass Manufacturing Company, Inc. (Trimco).
- c. Rockwood.
- d. Hager Manufacturing.

E. Smoke Seals, Intumescent Seals, Sound Seals, and/or Weatherstripping.

1. Acceptable Manufacturers:
 - a. Pemko Manufacturing, Inc.
 - b. National Guard Products (NGP).
 - c. Zero International.
2. No intumescent material is allowed on door frames. Where CBC requirements for positive pressure must be met, doors shall include all requirements as part of the door construction per 'Category A' guidelines as published by ITS/Warnock-Hersey. Only smoke gasketing applied around the perimeter of the frame to meet the 'S' smoke rating is permissible in instances where smoke control is required.

F. Astragals, Door Bottoms, and Thresholds:

1. Acceptable Manufacturers:
 - a. Pemko Manufacturing, Inc.
 - b. National Guard Products (NGP).
 - c. Zero International.
2. Thresholds shall comply with CBC 2016 and shall not exceed 1/2 inch in height.
3. Whether or not wider thresholds are specified below, thresholds shall not extend past door frame in interior conditions. Detail as part of engineering/shop drawings/means and methods before submittals. Thresholds that extend past door frame in exterior conditions shall wrap frame stops. Cut around stops, then continue into rabbits and face of frame.
 - a. Whether or not specified below, where thresholds are larger than frames all thresholds to have beveled miter ends.
 - b. 45-degree miter cut and a closed end, welded with returns to door/frame. Example: NGP manufacturing nomenclature RCE throughout.



G. Drip Guard:

1. Provide at exterior doors exposed to rain.
2. Size: Full Frame Width (FFW).
3. Provide devices painted to match adjacent frame. See Division 09 for paint and primer requirements.

SECTION 08 71 13
AUTOMATIC DOOR OPERATORS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Basis-of-Design: Horton Automatics, Product: Series 7100 or Series 4900LE system.
2. Stanley Manufacturing, Product: Magic Series.
3. LCN Manufacturing, Product: Sr. Swing with Reduced Force feature.
4. Besam Manufacturing, Product: SW200i.
5. Dorma Manufacturing, Product: ED400 Series.

1.2 GENERAL

- A. The operator system shall consist of a 120 VAC surface mounted electric operators with connecting arm and aluminum cover as well as wall-mounted push plate switches.
- B. The System shall be completely engineered, manufactured and assembled in the factory. All operator components shall be factory assembled, adjusted and tested. No field wiring or operator adjustment shall be required other than the connection to job-site power.

1.3 MATERIALS AND FABRICATION

A. Electric Operator:

1. The electric operating mechanism shall be Series 7000. The Series 7000 EasyAccess™ operator shall be a low-energy, self-contained, electromechanical design. The operator shall be powered open with a DC motor working through six reduction gears. Closing shall be by spring force. The motor shall be off when the door is in the closing mode. The door shall be capable of being manually operated with power on or off without damage to the operator.
2. The control shall be furnished with a selection switch that provides for two methods of actuating the automatic door. The selection switch shall enable the Owner to select the desired operation and adapt to changing conditions.
3. The finish shall match the finish on the adjacent storefront system.

B. Switch:

1. Switch shall be Model #C1260-4, 6 inch diameter stainless steel battery operated switch push plate engraved with the international accessibility insignia and marked "Press to Open".

END OF SECTION

SECTION 08 81 00

GLASS GLAZING

PART 1 PRODUCTS

1.1 GENERAL

- A. All glass shall be graded and meet requirements of ASTM C1036 and ASTM C1048, Type 1, quality q3. Each light of glass delivered and installed shall have affixed thereto the manufacturer's grade label.
- B. All Low-E coated glass shall have a permanent marking affixed at the spacer identifying the coated surface.
- C. Glazing material installed in Hazardous Locations subject to human impact shall be certified and permanently labeled as meeting applicable requirements referenced in NFPA 80 and 2016 CBC Section 2406.
 - 1. CPSC 16 CFR 1201, Category I and II.

1.2 GLASS TYPES

A. Float Glass:

- 1. Acceptable Manufacturers:
 - a. Vitro Architectural Glass.
 - b. Oldcastle Glass.
 - c. Viracon.
 - d. Guardian.
- 2. Material: 1/4 inch thick clear glass, tempered where required by CBC and where indicated on Drawings.

B. Low-E Insulating Glass:

- 1. Acceptable Manufacturers:
 - a. Vitro Architectural Glass. Product: Solarban 70XL (2) + Clear.
 - b. Oldcastle Glass.
 - c. Viracon.
 - d. Guardian.
- 2. Material: 1 inch thick hermetically sealed assembly consisting of 1/4 inch thick Low-E clear glass on the outboard surface (coating on the #2 surface), 1/2 inch air space and 1/4 inch thick clear glass on the inboard surface with a Summer Daytime U-value of 0.26 or less, Solar Heat Gain Coefficient (SHGC) of 0.27 or less, and Visible Light Transmittance of 64 percent. Glass shall be heat strengthened; tempered where required by CBC and where indicated on Drawings.

C. Insulating Spandrel Glass:

- 1. Acceptable Manufacturers:
 - a. Vitro Architectural Glass.

- b. Oldcastle Glass.
 - c. Viracon.
 - d. Guardian.
2. Material: 1-inch hermetically sealed assembly consisting of 1/4-inch Low-E clear glass on the outboard surface, 1/2-inch air space, and 1/4-inch clear tempered glass on the inboard surface with ceramic coating (frit) on the #3 surface. Glass shall be heat strengthened; tempered where required by CBC and where indicated on Drawings. Frit pattern and color as selected by Architect.

D. Laminated Glass:

- 1. Acceptable Manufacturers:
 - a. Vitro Architectural Glass.
 - b. Oldcastle Glass.
 - c. Viracon.
 - d. Guardian.
- 2. Material: 9/16 inch thick clear laminated architectural glass produced by bonding a 0.060 inch thick Saflex PVB clear interlayer between one pane of 1/4 inch thick clear tempered glass and one pane of 1/4 inch thick clear tempered glass under heat and pressure.

1.3 GLAZING SEALANT

- A. Glazing Sealants: ASTM C920, Type S, Grade NS, Uses "G" and "A". Dow Corning 795, Tremco "Proglaze" or GE Silicone Sealants; Tremco "Mono" acrylic sealant or accepted equal. All sealants shall be compatible with the type of glazing and window frame to which they are applied.

1.4 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene EPDM blocks with a Shore A durometer hardness of 85, ± 5 percent, chemically compatible with sealant used.
- B. Spacer Shims: Neoprene, 50-60 Shore A durometer hardness, minimum 3 inches long by one half the height of the glazing stop by thickness to suit application.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10-15 Shore A durometer hardness; coiled on release paper; black color; Tremco No. 440 tape.
- D. Glazing Splines: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; black color.
- E. Miscellaneous: Furnish all primers-sealers, setting blocks, shims, spacers, compression seals, etc., as required for a first class workmanlike job.

1.5 FABRICATION

- A. Flat Glass:
 - 1. Comply with ASTM C1036 Standard Specification for Flat Glass, Type 1, Class 1 (clear) or Class 2 (tinted, heat-absorbing and light reducing) and Quality q3.

2. ASTM C1048 Heat Treated Flat Glass, Kind HS or FT, Condition A (uncoated), B (spandrel glass, one surface coated), or C (other coated glass).
 - a. Heat Treated Flat Glass to be by horizontal (roller hearth) process with inherent rollerwave distortion parallel to the bottom edge of the glass as installed.
 - b. Maximum peak to valley rollerwave 0.003 inch in the central area and 0.008 inch within 10.5 inches of the leading and trailing edge.
 - c. Maximum bow and warp 1/32 inch per lineal foot.
 - d. All tempered architectural safety glass shall conform to ANSI Z97.1 and CPSC 16 CFR 1201.
 - e. For all fully tempered glass, provide heat soak testing conforming to EN14179 which includes a two hour dwell at 290 degrees C, ± 10 degrees C.

B. Insulating Glass:

1. Comply with ASTM E2190 Standard Specification for Insulating Glass Unit Performance and Evaluation.
 - a. Units shall be certified for compliance by the IGCC in accordance with the above ASTM test method.
2. The unit overall thickness tolerance shall be -1/16 inch / +1/32 inch. Unit constructed with patterned or laminated glass shall be +/-1/16 inch.
3. Comply with ASTM E546 Standard Test Method for Frost Point of Sealed Insulating Glass Units.
4. Comply with ASTM E576 Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position.
5. Sealed Insulating Glass Units to be double sealed with a primary seal of polyisobutylene and a secondary seal of silicone.
 - a. The minimum thickness of the secondary seal shall be 1/16 inch.
 - b. The target width of the primary seal shall be 5/32 inch.
 - c. There shall be no voids or skips in the primary seal.
 - d. Up to a maximum of 3/32 inch of the airspacer may be visible above the primary polyisobutylene sealant.
 - e. Gaps or skips between primary and secondary sealant are permitted to a maximum width of 1/16 inch by maximum length of 2 inches with gaps separated by at least 18 inches. Continuous contact between the primary seal and the secondary seal is desired.
6. Provide a hermetically sealed and dehydrated space. Lites shall be separated by an aluminum spacer with three bent corners and one keyed-soldered corner or four bent corners and one straight butyl injected zinc plated steel straight key joint.

C. Coated Vision Glass:

1. Comply with ASTM C1376 Standard for Pyrolytic and Vacuum Deposition Coatings on Glass.
2. Coated products shall be magnetically sputtered vacuum deposition (MSVD).

3. Edge Deletion: When Low-E coatings are used within an insulating unit, coating shall be edge deleted to completely seal the coating within the unit.
 - a. The edge deletion should be uniform in appearance (visually straight) and remove at least 95 percent of the coating.

D. Laminated Glass:

1. Comply with ASTM C1172 Standard Specification for Laminated Architectural Flat Glass.
2. All laminated architectural safety glass shall conform to ANSI Z97.1 and CPSC 16 CFR 1201.
3. Laminated glass products shall be fabricated free of foreign substances and air or glass pockets in autoclave with heat plus pressure.

E. Ceramic Coated Glass Products:

1. Comply with ASTM C1048 Standard Specification for Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated, Condition B.
2. Silk-screen pattern should be no more than 0.0625 inch off parallel from locating glass edge and no more than 0.0125 inch from edges other than locating glass edge.
3. There shall be a maximum of a 0.03125 inch variation in dot, hole or line location.

END OF SECTION

SECTION 08 88 13
FIRE RATED GLAZING

PART 1 PRODUCTS

1.1 GENERAL

- A. All glass shall be graded and meet requirements of ASTM C1036 and ASTM C1048, Type I, quality q3. Each light of glass delivered and installed shall have affixed thereto the manufacturer's grade label.
- B. Glazing material installed in Hazardous Locations, subject to human impact, shall be certified and permanently labeled as meeting applicable requirements referenced in NFPA 80.
 - 1. CPSC 16 CFR 1201, Category I and II.
- C. Each piece of fire-rated glazing material shall be labeled with a permanent logo including name of product, manufacturer, testing laboratory, fire rating period, and safety glazing standards.

1.2 GLASS TYPES

- A. Fire Protective Rated Glass in 20 minute assemblies:
 - 1. Acceptable Manufacturers:
 - a. Safti First. Product: SuperLite I.
 - b. Technical Glass Products (TGP).
 - c. Pilkington.
 - d. Vetrotech Saint-Gobain.
 - 2. Material: 1/4 inch thick, 20-minute rated assembly consisting of specialty tempered clear float glass with D-20 marking. Product shall meet the requirements of ANSI Z97.1, CPSC 16 CFR 1201 Category I and II, and UL 10C.
- B. Fire Protective Rated Glass in 45 minute assemblies:
 - 1. Acceptable Manufacturers:
 - a. Safti First. Product: SuperLite II-XL 45.
 - b. Technical Glass Products (TGP).
 - c. Pilkington.
 - d. Vetrotech Saint-Gobain.
 - 2. Material: 3/4 inch thick, 45-minute rated assembly consisting of inboard and outboard sheets of clear tempered glass with a fire resistive interlayer marked in accordance with CBC Sections 703.6 and 716.3. Product shall meet the requirements of ANSI Z97.1, CPSC 16 CFR 1201 Category I and II, and UL 10C.
- C. Fire Protective Rated Glass in 60 and 90 minute assemblies:
 - 1. Acceptable Manufacturers:
 - a. Safti First. Product: SuperLite X-45/60/90.

- b. Technical Glass Products (TGP).
 - c. Pilkington.
 - d. Vetrotech Saint-Gobain.
2. Material: 3/4 inch thick, 60 and 90-minute rated assembly consisting of clear glass. Product shall meet the requirements of ANSI Z97.1, CPSC 16 CFR 1201 Category I, ASTM E119, and UL 10C.
- D. Fire Resistive Rated Glass in 60-120 minute assemblies:
- 1. Acceptable Manufacturers:
 - a. Safti First. Product: SuperLite II-XL 60, 90, 120.
 - b. Technical Glass Products (TGP).
 - c. Pilkington.
 - d. Vetrotech Saint-Gobain.
 - 2. Material: 7/8 to 1-1/2 inch thick, 60 to 120-minute fire resistance rated assembly consisting of inboard and outboard sheets of clear tempered glass with fire resistive interlayer. Product shall meet the requirements of CPSC 16 CFR 1201 Category I and II and be tested to ASTM E119, NFPA 251, or UL 263.

1.3 GLAZING SEALANT

- A. Fire-Rated Glazing Tape: UL 10B and UL 10C compliant, high performance fire-rated glazing tape; Pemko FG3000 or accepted equal. Glazing tape shall be installed on both sides of frame at all vision lites in fire-rated doors. Tape shall be compatible with and acceptable for use with the type of glazing and window frame to which they are applied.

1.4 GLAZING ACCESSORIES

- A. Setting Blocks: Fire-Rated: Calcium silicate blocks, chemically compatible with sealant used.
- B. Spacer Shims: Neoprene, 50-60 Shore A durometer hardness, minimum 3 inches long by one half the height of the glazing stop by thickness to suit application.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10-15 Shore A durometer hardness; coiled on release paper; black color; Tremco No. 440 tape or accepted equal.
- D. Glazing Splines: Resilient polyvinyl chloride extruded shape to suit glazing channel retaining slot; black color.
- E. Miscellaneous: Furnish all primers-sealers, setting blocks, shims, spacers, compression seals, etc., as required for a first class workmanlike job.

END OF SECTION

SECTION 08 91 19

FIXED LOUVERS

PART 1 PRODUCTS

1.1 ACCEPTABLE MANUFACTURERS

- A. Wonder Metals Corporation, Redding, CA; 800-366-5877, www.wondermetals.com.
Product: Model SDL-6.
- B. C/S Group, Cranford, NJ; 800-526-6930, www.c-sgroup.com.
- C. The Airolite Company, LLC, Schofield, WI; 715-841-8757, www.airolite.com.

1.2 MATERIALS

- A. Steel Sheet: ASTM A653, G90 galvanized.

1.3 COMPONENTS

- A. Louver Blades:
 - 1. Slope: 36 degrees.
 - 2. Blade Type: Fixed, drainable.
 - 3. Steel Thickness: 16 gauge.
- B. Frame:
 - 1. Shape: Channel.
 - 2. Head, jamb and sill material thickness: 16 gauge steel.
 - 3. Corners: Boxed.
- C. Intermediate concealed vertical mullions: Same material and gauge as louver.
- D. Fasteners and Anchors: Stainless steel or type as recommended by manufacturer.

1.4 ACCESSORIES

- A. Flashings: Of same material as louver frame.
- B. Insect Screen and Frame: Galvanized steel frame with 18 x 14 galvanized insect mesh, fabricated by louver manufacturer. Install on interior side of louver.
- C. Sealants: As specified in Section 07 92 00.
- D. Neoprene isolation pads for installation between dissimilar metals.
- E. Insulated Blank-Off Panels: Assembly composed of a 0.032-inch aluminum face sheet, 2 inches of expanded polystyrene insulation, and a 0.032-inch aluminum back sheet as manufactured by Greenheck or accepted equal.
 - 1. Face Sheet Finish: To match louver finish.
 - 2. Back Sheet Finish: Mill finish, as standard with manufacturer.

1.5 FABRICATION

- A. Louver Size: 6 inches deep, face measurements as indicated on Drawings, but not to exceed 40 square feet per panel. Nominal free area opening percentage of 58 percent, with storm-proof blades.
- B. Head and Sill Members: Roll formed to required shape, one piece per location.
- C. Vertical Mullions: At louver panels greater than 48 inches wide, provide intermediate concealed vertical mullions for support of louver blades at interior side of panels.
 - 1. Spacing: Centered on width of louver, 72 inches on center maximum.
- D. All welded construction.
- E. Screens: Screw to louver frame.

1.6 FINISHES

- A. Factory Finish: Prime paint finish.
- B. Site Finish: Paint finish under provisions of Section 09 91 00. Color as selected by Architect.
- C. Provide factory finished louvers. Finish louvers after assembly.
 - 1. 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. Custom color as selected by Architect.

END OF SECTION

SECTION 09 21 16.23

GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. United States Gypsum Company, Chicago, IL; 800-874-4968, www.usg.com. Product: Cavity Shaft Wall.
2. National Gypsum Company, Charlotte, NC 28211; phone: 704-365-7300, fax: 800-329-6421, www.nationalgypsum.com. Product: eXP Cavity Shaftwall System.
3. Georgia-Pacific Corporation, Atlanta, GA 30303; toll free: 800-824-7503, phone: 404-652-4000, fax: 404-230-5624, www.gp.com. Product: DensGlass Shaftliner.

1.2 PANEL PRODUCTS

- A. Gypsum Board: ASTM C1396/C1396M; 5/8-inch thick, Type X, maximum permissible length; ends square cut, tapered edges.
- B. Gypsum Shaftliner Board: ASTM C1396/C1396M; 1-inch thick, Type X, maximum permissible length, 24 inches wide, double beveled edges.
1. Basis-of-Design Product: Sheetrock Brand Gypsum Liner Panels by United States Gypsum Company; or accepted equal.

1.3 METAL FRAMING

- A. Conform to the requirements of Section 09 22 16 for conditions indicated on Drawings.
- B. Metal Studs: Steel C-H Studs, J and E-Studs.
- C. Metal Runners: J-Runners.

1.4 ACCESSORIES

- A. Accessories: As recommended by the gypsum board manufacturer to meet required fire ratings.
- B. Corner Bead, U Bead (Edge Trim), Metal Trim and Control Joints: GA 216; ASTM C1047; sheet steel, zinc coated by hot-dipped process in accordance with ASTM A653/A653M, minimum G40 coating.
- C. Joint Materials: ASTM C475, GA 216; reinforcing tape, joint compound, adhesive, water and fasteners.
- D. Fasteners: Screws, Type S, conforming to ASTM C954, self-drilling and self-tapping steel screws with double-lead thread design as approved by system manufacturer for standard and heavier gauge load bearing steel framing.
- E. Acoustical Insulation: Refer to Section 09 81 00.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

F. Acoustical Sealant: Refer to Section 07 92 00.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 PRODUCTS

1.1 METAL FRAMING SYSTEM

A. Acceptable Manufacturers:

1. ClarkDietrich Building Systems, West Chester, OH; 513-870-1100, www.clarkdietrich.com.
2. MarinoWARE, South Plainfield, NJ; 800-627-4661, www.marinoware.com.
3. CEMCO, Pittsburg, CA; 925-473-9340, www.cemcosteel.com.
4. SCAFCO Steel Stud Company, Spokane, WA; 509-343-9000, www.scafco.com.

1.2 COMPONENTS

A. Framing System Components:

1. 20 Gauge and Thinner: Manufactured per ASTM C645 with material meeting the requirements of ASTM A1003, Non-structural Grade 33 (NS33).
2. 18 Gauge: Manufactured with material meeting the requirements of ASTM A1003, Structural Grade 33, Type H (ST33H).
3. 16 Gauge and Thicker: Manufactured with material meeting the requirements of ASTM A1003, Structural Grade 50, Type H (ST50H).

B. Studs and Joists: ASTM A653/A653M non-load bearing rolled steel, channel shaped, punched for utility access, depths, gauges, and spacing as indicated on the Drawings.

C. Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs. Top track shall have extended leg retainers.

D. Slotted Track: Slotted track system for positive attachment of metal studs to track, for Head of Wall expansion joint movement (cyclic) and static Joint System in fire-rated construction, as detailed and required on Drawings, in compliance with UL 2079 cyclical movement $\pm 1/2$ inch overall 1 inch movement. Products: BlazeFrame DSL at rated assemblies and MaxTrak at non-rated assemblies as manufactured by ClarkDietrich Building Systems or accepted equal.

1. Forming steel shall conform to ASTM A1003, Structural Grade 33, Type H (ST33H).
2. Formed steel shall be galvanized in accordance with ASTM A653 for a Class G-40 by the hot dip process.
3. Slotted track shall be provided in standard widths and gauges, as required and indicated on Drawings. Down standing legs shall be nominally 2-1/2 inches and shall be provided with 1-1/2 inch slots at 1 inch on center.
4. Fasteners:
 - a. For attachment of studs to slotted track, minimum No. 8 corrosion resistant by 1/2 inch waferhead screws.
 - b. For attachment of slotted track to overhead structural element, as provided for the structural details affecting the work.

- E. Furring and Bracing Members: Of same material as studs; thickness to suit purpose.
- F. Sheet Metal Backing: 16 gauge, unless noted otherwise on Drawings.
- G. Hat-Shaped, Rigid Furring Channels: ASTM C645, 7/8 inch deep.
- H. Headers and Jambs: Manufacturer's proprietary shape used to form header beams and jambs, columns, or posts of web depths indicated, unpunched, with stiffened flanges.
- I. Resilient Furring Channels: 1/2 inch deep, sheet steel members designed to reduce sound transmission.
- J. Fasteners: ASTM C1513, self-drilling, self-tapping corrosion resistant screws.
- K. Anchorage Devices: As indicated on Drawings.
- L. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type II organic zinc rich.

1.3 FINISHES

- A. Studs and Joists: Provide galvanized finish as follows:
 - 1. Coating Class: G-40 per ASTM A653. A40 galvanized products are not acceptable.
- B. Tracks and Headers: Provide galvanized finish as follows:
 - 1. Coating Class: G-40 per ASTM A653. A40 galvanized products are not acceptable.
- C. Bracing, Furring, Bridging: ASTM C645, hot dip galvanized to Coating Class G-40 per ASTM A653.
- D. Plates, Gussets, Clips: ASTM C645, hot dip galvanized to Coating Class G-40 per ASTM A653.
- E. No equivalent coatings allowed.

END OF SECTION

SECTION 09 22 26.23
METAL SUSPENSION SYSTEMS

PART 1 PRODUCTS

1.1 MATERIALS

- A. Galvanized or galvanized steel conforming to ASTM A653/A653M, minimum G40 or Z120.
- B. Grade:
 - 1. 16 gauge and heavier, $F_y = 50$ ksi
 - 2. 18 gauge and lighter, $F_y = 33$ ksi minimum.

1.2 COMPONENTS

- A. Frame Members: ASTM C645.
 - 1. Main Runners: Cold-rolled steel channels; 1-1/2 inch by 16 gauge; 0.475 pounds per foot, minimum.
 - 2. Cross-Furring: Cold-rolled steel hat channels: 7/8 inch by 22 gauge.
- B. Wire Hangers: ASTM A641/A641M, zinc-coated wire, Class 1, soft temper, pre-stretched.
- C. Resilient Sound Isolation Products:
 - 1. Manufacturer: Kinetics Noise Control, Inc., Dublin, OH; 614-889-0480, www.kineticsnoise.com, or accepted equal.
 - a. Products:
 - 1) Model ICC Deck-Suspended Ceiling Hangers. Spring rate as selected by Architect from full range of manufacturer's standard spring rates.
 - 2) Model SRP Perimeter Isolation Board. Material shall be 3/8 inch thick crosslinked expanded polyethylene with a density range of 2.0 to 2.4 pounds per cubic foot per ASTM D3575.
 - 3) Perimeter Sealant: Non-hardening; ASTM C920 Type S, Grade NS, Class 35, Use: T, NT, O, M, G, I. Color as selected by Architect.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. USG – United States Gypsum Company, Chicago, IL 60606; toll free: 800-874-4968, phone: 312-606-4000, fax: 312-606-5566, www.usg.com.
2. National Gypsum Co., Charlotte, NC 28211; phone: 704-365-7300, fax: 800-329-6421, www.nationalgypsum.com.
3. GP-Gypsum – Georgia-Pacific Corp., Atlanta, GA 30303; toll free: 800-824-7503, phone: 404-652-4000, fax: 404-230-5624, www.gp.com.
4. Pabco Gypsum, Newark, CA 94560; phone: 510-792-9555, fax: 510-794-8725, www.pabco gypsum.pacocoast.com.
5. CertainTeed Corporation, Malvern, PA; toll free: 800-233-8990, www.certainteed.com.

1.2 GYPSUM BOARD

A. Type X Gypsum Board: ASTM C1396/1396M; 5/8-inch thick; 2.2 pounds per square foot; fire resistant core; maximum permissible length; ends square cut, tapered edges.

1. Acceptable Products:

- a. Sheetrock Brand Firecode Core manufactured by USG,
- b. Gold Bond Brand XP Fire-Shield Gypsum Board manufactured by National Gypsum,
- c. ToughRock Fireguard manufactured by G-P Gypsum,
- d. CertainTeed Type X manufactured by CertainTeed Corporation.
- e. or accepted equal.

B. Sustainable Gypsum Board: ASTM C1396/1396M; 5/8-inch thick; 1.8 pounds per square foot; fire resistant core; maximum permissible length; ends square cut, tapered edges.

1. Acceptable Products:

- a. Sheetrock Brand Ecosmart Panels Firecode X manufactured by USG.
- b. or accepted equal.

C. Moisture Resistant Gypsum Board: ASTM C1396/C1396M; 5/8 inch thick Type X, moisture and mold resistant core, encased in moisture resistant paper facers; maximum permissible length; ends square cut, tapered edges.

1. Average water absorption after two-hour immersion per ASTM C473: 5 percent or less.

2. Mold and mildew resistance per ASTM D3273: Minimum average score 8.

3. Acceptable Products:

- a. Sheetrock Brand Mold Tough Gypsum Panels manufactured by USG,
- b. Gold Bond Brand XP Gypsum Board manufactured by National Gypsum,
- c. ToughRock Mold Guard manufactured by G-P Gypsum,

- d. M2Tech Type X manufactured by CertainTeed Corporation.
- e. or accepted equal.

1.3 ACCESSORIES

- A. Corner Bead, Edge Trim, and Decorative Dividers: ASTM C1047; zinc-coated sheet steel.
- B. Control Joints: ASTM C1047; roll-formed zinc joint with removable protected opening; provided in accordance with UL fire rated assemblies. Acceptable product: Zinc Control Joint No. 093 manufactured by USG, or accepted equal.
- C. Screws:
 - 1. ASTM C1002, Type S or Type A; bugle head; self-drilling and self-tapping screws for light gauge steel framing (less than 0.033 inch thick).
 - 2. ASTM C954; bugle head; self-drilling and self-tapping screws for heavy gauge steel framing (0.033 inch to 0.112 inch thick).
- D. Jointing Tape: ASTM C475/C475M; 2 inch wide heavy duty paper joint tape.
- E. Joint Compound: ASTM C475/C475M.
- F. Primer-Surfacer (used in lieu of skim coat in a Level 5 finish): High-build interior coating finish applied with an airless sprayer. Products: Sheetrock Brand Primer-Surfacer Tuff-Hide manufactured by USG, ProForm Brand Surfacer/Primer manufactured by National Gypsum, or accepted equal. Note: Walls applied with primer-surfacer do not require drywall paint primer prior to application of finish coats.
- G. Acoustical Sealant: Refer to Section 07 92 00.
 - 1. Provide sealants that meet VOC requirements of South Coast Air Quality Management District (SCAQMD) Rule 1168. Information is available at www.aqmd.gov.
- H. Firestop Putty Pads for Electrical Boxes: Intumescent moldable firestop putty pad. Acceptable products: SSP4S 7.25 inches by 7.25 inches or SSP9S 9 inches by 9 inches manufactured by Specified Technologies Inc. (STI), Somerville, NJ; 800-992-1180, www.stifirestop.com, or accepted equal.

1.4 GYPSUM SHEATHING

- A. ASTM C1177/C1177M, glass mat-faced; or ASTM C1278/C1278M, fiber reinforced; water-resistant treated gypsum core; 5/8-inch thick Type X.
 - 1. Acceptable Products:
 - a. DensGlass Fireguard Sheathing manufactured by GP-Gypsum,
 - b. SecuRock Brand Glass-Mat Sheathing manufactured by USG,
 - c. Gold Bond Brand e²XP Extended Exposure Sheathing manufactured by National Gypsum Co.,
 - d. GlasRoc Sheathing manufactured by CertainTeed Corporation.
 - e. or accepted equal.

1.5 CEMENTITIOUS BACKER BOARD

- A. Cement Board: ANSI A118.9 and ASTM C1325; polymer-modified cementitious board, with alkali-resistant fiberglass mesh reinforcing facers (front and back); long edges wrapped.
1. Thickness: 5/8 inch.
 2. Acceptable Products:
 - a. Durock Brand Cement Board by United States Gypsum Co.,
 - b. PermaBase Brand Cement Board by National Gypsum Co.,
 - c. or accepted equal.
- B. Accessories:
1. Screws: No. 6 gauge by sufficient length to penetrate 3/8 inch into steel framing, self-drilling, ribbed wafer head screws or ribbed bugle head screws; minimum 500 hour corrosion resistant finish per ASTM B117.
 2. Jointing Tape: Alkali-resistant fiberglass mesh tape; 2 inches wide.
 3. Bonding and Jointing Materials: ANSI A118.1, dry-set Portland cement mortar; or ANSI A118.4, latex Portland cement mortar.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers - Tile:

1. Daltile Corp., Dallas, TX; (800) 933-8453, www.daltile.com.
2. United States Ceramic Tile Co., East Sparta, OH; (330) 866-5531, www.usctco.com.
3. American Olean Tile Co., Dallas, TX; (888) 268-8453, www.aotile.com.
4. Crossville Inc., Crossville, TN; (931) 484-2110, www.crossvilleinc.com.
5. Interceramic, Garland, TX; (800) 688-5671, www.interceramic.com.
6. Emser Tile, Los Angeles, CA; (323) 650-2000, www.emser.com.

B. Acceptable Manufacturers - Setting Materials:

1. Custom Building Products, Seal Beach, CA; (209) 518-1153, www.custombuildingproducts.com.
2. Laticrete International, Inc., Bethany, CT; (800) 243-4788, www.laticrete.com.
3. Mapei Corp., Deerfield Beach, FL; (800) 426-2734, www.mapei.com.

C. Acceptable Manufacturers - Grout:

1. Custom Building Products.
2. Laticrete International, Inc.
3. Mapei Corp.

D. Acceptable Manufacturers - Sealants:

1. Custom Building Products.
2. Laticrete International, Inc.
3. Mapei Corp.
4. Color Caulk, Inc.

E. Acceptable Manufacturers - Crack Isolation and Waterproofing Membranes:

1. Custom Building Products.
2. Laticrete International, Inc.
3. Mapei Corp.

F. Acceptable Manufacturers - Accessories:

1. Schlüter-Systems L.P., Plattsburgh, NY; (800) 472-4588, www.schluter.com.
2. Custom Building Products, Seal Beach, CA; (209) 518-1153, www.custombuildingproducts.com.

- G. Single Source Responsibility: Provide setting, grouting, membrane, and sealant materials from a single manufacturer to ensure system compatibility and quality, and to comply with manufacturer's warranty requirements.

1.2 CERAMIC TILE

- A. General: ANSI A137.1, Standard Grade. Packaging shall be grade sealed. Seals shall be marked to correspond with the marks on the signed master grade certificate.

B. Properties:

1. Impact resistant with a minimum breaking strength of 90 pounds for wall tiles and 250 pounds for floor tiles in accordance with ASTM C648.
2. Water absorption shall be 0.50 percent maximum in accordance with ASTM C373.
3. Tile flooring shall be stable, firm, and slip resistant per CBC Section 11B-302.1. Floor tiles shall have a minimum dynamic coefficient of friction of 0.42 wet in accordance with the DCOF AcuTest.
4. Floor tiles shall be minimum Class IV – Heavy Traffic durability when tested in accordance with ASTM C1027 for abrasion resistance as related to foot traffic.

C. Products:

1. Ceramic Mosaic Floor Tiles: Daltile Corp., Keystones Series.
 - a. Nominal Size: 2 inches by 2 inches.
 - b. Thickness: 1/4 inch.
 - c. Surface Finish: Unglazed.
 - d. Color: As selected by Architect from manufacturer's full range of colors.
2. Ceramic Wall Tiles: Daltile Corp., Semi-gloss Series.
 - a. Nominal Size: 4-1/4 inches by 4-1/4 inches.
 - b. Thickness: 5/16 inch.
 - c. Surface Finish: Semi-gloss or matte glazed.
 - d. Color: As selected by Architect from manufacturer's full range of colors.

- D. Special Shapes (trimmers, angles, bases, caps, stops, and returns): Same nominal size as field tile; rounded concave and convex surfaces; same properties as field tile (moisture absorption, surface finish, and color). Provide radius at all outside vertical and horizontal corner tile. Provide base at wall tile.

- E. Wall Base: Unless otherwise indicated, at restrooms, wall base shall be 6 inches high with 3/8 inch minimum cove radius.

1.3 SETTING MATERIALS

- A. Latex Portland Cement Mortar: Prepackaged, one-part, high performance, latex polymer modified dry-set, thin-set mortar. Meets or exceeds ANSI A118.4.

1. Products:

- a. Custom Building Products MegaLite Crack Prevention Mortar.
- b. Laticrete 254 Platinum Multipurpose Thin-Set Mortar.
- c. Mapei Ultraflex 3.

- d. Or accepted equal.
- B. Latex Portland Cement Mortar for Large Format Tile: Prepackaged, one-part, high performance, latex polymer modified dry-set, thin-set mortar. Meets or exceeds ANSI A118.4.
 - 1. Products:
 - a. Custom Building Products ProLite Tile & Stone Mortar.
 - b. Laticrete 4-XLT.
 - c. Mapei Ultraflex LFT.
 - d. Or accepted equal.
- C. Latex Modified Crack Isolation Mortar for use at Glass Wall Tile: Prepackaged, one-part, high performance, lightweight latex polymer modified dry-set, thin-set mortar. Meets or exceeds ANSI A118.4.
 - 1. Products:
 - a. Custom Building Products MegaLite Crack Prevention Mortar.
 - b. Laticrete 255 MultiMax.
 - c. Mapei Ultralite Mortar.
 - d. Or accepted equal.
- D. Mortar Bed:
 - 1. Materials:
 - a. Cement: Portland cement, ASTM C150 Type I.
 - b. Aggregate: ASTM C144, clean, graded, and passes a 16-mesh screen.
 - c. Hydrated Lime: ASTM C206, Type S or ASTM C207, Type S.
 - d. Water: Clean and potable.
 - 2. Mortar Mix: Comply with ANSI A108.1A Section A-4.1a.2.

1.4 GROUTING MATERIALS

- A. Epoxy Grout: 100 percent solids epoxy grout; stainless, non-sagging, water cleanable; conforming to ANSI A118.3.
 - 1. Products:
 - a. Custom Building Products CEGLite Commercial Epoxy Grout.
 - b. Laticrete Spectralock Pro Premium.
 - c. Mapei Kerapoxy IEG.
 - d. Or accepted equal.
 - 2. Colors as selected by Architect.

1.5 SEALANTS

- A. Latex siliconized sealant, non-sanded, in conformance with ASTM C920, Type S, Grade NS, Class 25, Uses NT, M and G. Color to match grout color.
 - 1. Products:
 - a. Custom Building Products 100% Silicone Commercial Caulk.

- b. Laticrete Latasil.
- c. Mapei Keracaulk.
- d. Color Caulk, Inc. Latex Siliconized Sealant.
- e. Or accepted equal.

1.6 MEMBRANES

A. Crack Isolation Membrane at Slab-on-Grade: Trowel applied or self-adhering sheet membrane; load bearing; bonded; conforming to ANSI A118.12.

1. Products:

- a. Custom Building Products Fracture Free.
- b. Laticrete Blue 92.
- c. Mapei Mapelastic 2, Crack Isolation Membrane, flexible thin, 40-mil lightweight, load-bearing, fabric-reinforced "peel-and-stick" crack-isolation membrane.
- d. Or accepted equal.

B. Waterproofing Membrane at Raised Slabs: Trowel applied, liquid, load bearing; bonded; conforming to ANSI A118.10.

1. Products:

- a. Custom Building Products Custom 9240 Waterproofing and Crack Prevention Membrane. Self-curing liquid elastomeric membrane with reinforcing fabric.
- b. Laticrete 9235 Waterproofing Membrane with Microban. Self-curing liquid elastomeric membrane with reinforcing fabric forming a flexible, seamless waterproof membrane bonded to the substrate. Contains an antimicrobial protection to inhibit growth of mold and mildew.
- c. Mapei Mapelastic 400, premixed, flexible, thin, ultra fast-drying waterproofing membrane.
- d. Or accepted equal.

1.7 ACCESSORIES

A. Mortar Bed Reinforcing Mesh: ASTM A82 and ASTM A185; galvanized welded wire fabric; 16 gauge wire; 2 inch by 2 inch mesh.

B. Expansion Joints: DILEX-AKWS surface joint profile with aluminum anchoring legs and 1/4 inch wide PVC movement zone manufactured by Schlüter-Systems L.P., Custom Building Products, or accepted equal. PVC color as selected by Architect from manufacturer's full range of standard colors.

C. Trim: QUADec Q 125 AE 1/2 inch square edge anodized aluminum corner trim manufactured by Schlüter-Systems L.P., Custom Building Products, or accepted equal.

END OF SECTION

SECTION 09 51 13
 ACOUSTICAL PANEL CEILINGS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers – Metal Suspension Systems:

1. USG Interiors, Inc., Chicago, IL 60606-4678; phone: 800.950.3839; fax: 312.606.4093; URL: <http://www.usg.com>. Refer to ICC ESR-1222.
2. Armstrong World Industries, Inc., Lancaster, PA 17603-3550; phone: 888.234.5464; fax: 800.572.8324; URL: <http://www.armstrong.com>. Refer to ICC ESR-1308.

B. Acceptable Manufacturers – Lay-in Acoustical Panels:

1. USG Interiors, Inc.
2. Armstrong World Industries, Inc.

1.2 METAL SUSPENSION SYSTEM

A. Metal Suspension Grid: ASTM C635, heavy duty classification in compliance with ASCE 7-10 13.5.6.2.2 (a); hot-dipped galvanized steel (minimum G40); 15/16 inch face; structural tee main and cross members; capped with steel, coated with factory applied baked-on white enamel paint.

1. Main runners, cross runners, splices, expansion devices, and intersection connectors shall be designed to carry a mean ultimate test load of not less than 180 pounds in compression and tension per ASTM E580.

B. Products, Suspension System:

	Main Runner	Cross Tees
1. Armstrong Prelude XL	7301	XL7342 and XL7328
2. USG Donn DX	DX26	DX424 and DX216

C. Products, Suspension System Accessories:

	Wall Angle	Seismic Clip at Wall Angle
1. Armstrong	7800	BERC2
2. USG Donn	M7	ACM7

1.3 METAL SUSPENSION SYSTEM

- A. Metal Suspension Grid: ASTM C635, heavy duty classification in compliance with ASCE 7-10 13.5.6.2.2 (a); hot-dipped galvanized steel (minimum G40); 9/16 inch face; structural tee main and cross members; capped with steel, coated with factory applied baked-on white enamel paint.
1. Main runners, cross runners, splices, expansion devices, and intersection connectors shall be designed to carry a mean ultimate test load of not less than 180 pounds in compression and tension per ASTM E580.

B. Products, Suspension System:

	Main Runner	Cross Tees
1. Armstrong Suprafine XL	7501	XL7540
2. USG Donn Centricitee DXT	DXT26	DXT424

C. Products, Suspension System Accessories:

	Wall Angle	Seismic Clip at Wall Angle
1. Armstrong	7800	BERC2
2. USG Donn	M9	ACM7

1.4 ACCESSORIES – METAL SUSPENSION SYSTEM

- A. Metal suspension system accessories as required for a complete system including but not limited to moldings, stabilizer bars, splices, hold down clips, and light fixture clips.
- B. Wire Hangers: ASTM A641/A641M, zinc-coated wire, Class 1, soft temper, pre-stretched, with a yield stress of at least three times the design load; sizes and gauges as shown on the Drawings and as specified in this Section.
- C. Support channels and hangers: Galvanized primed steel (minimum G30); size and type to suit application and to meet seismic requirements and as specified in this Section.
- D. Seismic Isolation Joints:
1. Acceptable Manufacturers:
 - a. Balco. Product: AC Accordion Acoustical Ceiling with 100% movement.
 - b. MM Systems.
 - c. Watson Bowman Acme.
 - d. InPro Corporation.
 2. Materials:
 - a. Variable extruded white Santoprene seal fixed between two extruded aluminum frames. Seal shall allow 100 percent expansion/contraction movement and 100 percent vertical shear movement in conformance with ASTM E1399. Color as selected by Architect.

1.5 ACOUSTICAL LAY-IN PANELS

A. Panel Type 1:

1. ASTM E1264, Type III, Form 2; Pattern C D.
2. Material: Wet-formed mineral fiber with factory-applied latex paint finish.
3. Properties:
 - a. Color: White.
 - b. Light Reflectance: Minimum 0.82.
 - c. NRC: Minimum 0.55.
 - d. Fire Resistance: CBC Class A (NFPA Class A); Flame Spread: 25 or under; Smoke Developed: 50 or under per ASTM E84.
4. Products:

	Size (ft x ft x in thick)	Edge
Armstrong Cortega, No. 769	2 x 4 x 5/8	Square
USG Radar, No. 2310	2 x 4 x 5/8	Square

B. Panel Type 2:

1. ASTM E1264, Type III, Form 2; Pattern C D.
2. Material: Wet-formed mineral fiber with factory-applied latex paint finish.
3. Properties:
 - a. Color: White.
 - b. Light Reflectance: Minimum 0.82.
 - c. NRC: Minimum 0.55.
 - d. Fire Resistance: CBC Class A (NFPA Class A); Flame Spread: 25 or under; Smoke Developed: 50 or under per ASTM E84.
4. Products:

	Size (ft x ft x in thick)	Edge
Armstrong Cortega, No. 703	2 x 4 x 5/8	Angled Tegular
USG Fissured, No. 507	2 x 4 x 5/8	Angled Tegular

C. Panel Type 3:

1. ASTM E1264, Type III, Form 2; Pattern C D.
2. Material: Wet-formed mineral fiber with factory-applied latex paint finish.
3. Properties:
 - a. Color: White.
 - b. Light Reflectance: Minimum 0.82.
 - c. NRC: Minimum 0.55.
 - d. Fire Resistance: CBC Class A (NFPA Class A); Flame Spread: 25 or under; Smoke Developed: 50 or under per ASTM E84.

4. Products:

	Size (ft x ft x in thick)	Edge
Armstrong Cortega, No. 704	2 x 2 x 5/8	Angled Tegular
USG Radar, No. 2120	2 x 2 x 5/8	Angled Tegular

D. Accessories – Acoustical Lay-in Panels:

1. Touch-up Paint: Type and color to match acoustical and grid units.

1.6 SPECIALTY CEILING SYSTEMS

A. Wood Ceiling System:

1. Acceptable Manufacturers:
 - a. Armstrong World Industries, Inc. Product: WoodWorks Channeled Natural Variations Planks with acoustical fleece.
 - b. USG Interiors, Inc.
2. Grid System: 15/16 inch Vector.
3. Panel Size: 24 inches x 24 inches x 11/16 inch.
4. Panel Material: Fire retardant medium density fiberboard with real wood veneer.
5. Panel Finish: Tinted semigloss coating.
6. Perforations: 13 mm profile with 3 mm groove.
7. Surface Burning Characteristics, per ASTM E84:
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.

B. Wood Ceiling System:

1. Acceptable Manufacturers:
 - a. Armstrong World Industries, Inc. Product: WoodWorks Linear Veneered Planks with factory-applied black acoustical fleece, Model No. 6440W1CWA.
 - b. USG Interiors, Inc.
2. Grid System: 144 inches long x 15/16 inch wide x 1-11/16 inch high heavy duty concealed linear carriers with factory-applied integral clips.
3. Plank Size: 72 inches long x 3-3/4 inches wide x 3/4 inch thick.
4. Panel Material: Fire retardant particle board with Walnut face-cut real wood veneer.
5. Panel Finish: Tinted semigloss coating.
6. Surface Burning Characteristics, per ASTM E84:
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.

C. Wood Panel Ceiling System:

1. Acceptable Manufacturers:
 - a. Basis-of-Design: Armstrong World Industries, Inc. Product: WoodWorks Vector No. 5403W5NMP with acoustical insulation.

- b. USG Interiors, Inc.
 2. Grid System: 15/16 inch in silver satin color.
 3. Panel Size: 24 inches x 24 inches x 3/4 inch.
 4. Panel Material: Fire retardant medium density fiberboard with real wood veneer.
 5. Panel Finish: Tinted semigloss coating.
 6. Panel Surface Texture: Smooth.
 7. Perforations: Oval straight slotted.
 8. Reveal: Vector reveal, 1/4 inch.
 9. Edge banding and trim shall match face veneer.
 10. FSC certification required.
 11. Dimensional Stability: Standard.
 12. NRC: 0.55 per ASTM C423.
 13. Surface Burning Characteristics: Class A per ASTM E84.
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.
 14. Accessories:
 - a. Acoustic Insulation: No. 8200100, 24 inch x 24 inch x 1 inch fiberglass infill panel, black.
 - b. Vertical Edge Trim: Axiom Vector No. AX4VESTR, 4 inch high aluminum, silver satin color.
 - c. Safety Cable: No. 6091.
 - d. Self-Tapping Screws: No. 92715A620.
- D. Wood Grille Ceiling System:
1. Acceptable Manufacturers:
 - a. Basis-of-Design: Armstrong World Industries, Inc. Product: WoodWorks Grille Custom, based on standard No. 7266BO, with backer installation method and acoustical insulation.
 - b. Rulon International.
 2. Grid System: 15/16 inch in black color.
 3. Panel Size: 12 inches x 96 inches.
 4. Blades: Vertical, 2-1/4 inches high; 8 blades per panel.
 5. Blade Material: 1 inch nominal thickness, Yellow Poplar species.
 6. Finish: Tinted semigloss coating, custom color blend (GDC, GLC, and GWN).
 - a. Blade Finish Order: GDC, GLC, GWN, GDC, GLC, GDC, GWN, GLC.
 7. Surface Texture: Smooth.
 8. Trim: Coordinating to match.
 9. Seams shall be staggered.
 10. Dimensional Stability: Standard.

11. NRC: 0.75 with acoustic insulation per ASTM C423.
12. Surface Burning Characteristics: Class A per ASTM E84. Panel assembly shall be treated with Class A intumescent coating.
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 450 or less.
13. Accessories:
 - a. Acoustic Insulation: No. 6657, 11 inch x 48 inch bio-acoustic infill panel, black.
 - b. Self-Tapping Screws: No. 92715A620.
 - c. Site Applied Coatings: Where panels are field cut, cut surfaces shall be coated with Class A intumescent coating and stain to match blade color.

E. Metal Panel Ceiling System:

1. Acceptable Manufacturers:
 - a. Basis-of-Design: Armstrong World Industries, Inc. Product: MetalWorks Tegular No. 6464M2SG with acoustical insulation.
 - b. USG Interiors, Inc.
2. Grid System: 9/16 inch in silver grey color.
3. Panel Size: 24 inches x 24 inches.
4. Panel Material: 0.021 inch thick electrogalvanized steel.
5. Panel Edge Profile: Square tegular, 9/16 inch.
6. Panel Finish: Factory-applied powder coat paint finish in silver grey color.
7. Surface Texture: Smooth.
8. Perforations: Round, in diagonal pattern.
9. Dimensional Stability: Standard.
10. NRC: 0.90 with acoustic insulation per ASTM C423.
11. Surface Burning Characteristics: Class A when tested per ASTM E84 and complying with ASTM E1264 Classification.
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.
12. Accessories:
 - a. Acoustic Insulation: No. 8200100, 24 inch x 24 inch x 1 inch fiberglass infill panel, black.
 - b. Edge Cap: No. 6099 9/16 inch edge cap for cut 5/16 inch tegular panels.

F. Baffle System:

1. Acceptable Manufacturers:
 - a. Armstrong World Industries, Inc. Product: Soundsoak Acoustical Baffles.
 - b. USG Interiors, Inc.
2. Composition: Fiberglass core.

3. Fabric: Custom fabric as selected by Architect.
 - a. Colors: As indicated on Drawings.
4. Size: two feet by four feet.
5. Thickness: Two inches.
6. Edge Detail: Square.
7. Flame Spread: Class A per ASTM E84.
8. Acoustical Absorption: 1.8 sabins per square foot.
9. Mounting: Eye hooks with wire hanging kit.

G. Acoustical Clouds:

1. Acceptable Manufacturers:
 - a. Armstrong World Industries, Inc. Product: MetalWorks torsion spring system.
 - b. USG Interiors, Inc.
2. Cloud Shapes and Sizes: As indicated on Drawings.
3. Grid: 15/16 inch Prelude XL, pre-slotted, white color, with grid layout for 30 inch x 30 inch panels.
4. Panels: MetalWorks Model No. 7213 M17 SG.
 - a. Material: 0.040 inch thick aluminum.
 - b. Size: 30 inches x 30 inches.
 - c. Perforation Pattern: 2.4 mm round holes, staggered, with 23 percent open area.
 - d. Color: Gun Metal.
5. Edge Trim: Extruded Perimeter Trim Model No. 7147.
 - a. Height: 4 inches.
 - b. Color: Gun Metal.
6. Acoustic Insulation: 1 inch thick black fiberglass infill panel.
 - a. System NRC Value: 0.90.
7. System Flame Spread: Class A per ASTM E1264
8. Provide specialty ceiling system accessories as required for a complete system.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS, VINYL SHEET FLOORING

A. Acceptable Manufacturers:

1. Armstrong World Industries, Inc., Lancaster, PA; 800-292-6308, www.armstrong.com.
Product: Possibilities, Petit Point.
2. Forbo Industries, Inc.
3. Tarkett, Inc.
4. Mannington Commercial.

B. Vinyl Sheet Materials:

1. Vinyl sheet floor covering with backing, conforming to ASTM F1303, Type II, Grade 1, Backing Class A.
 - a. Type II PVC Binder Content: 34 percent, minimum.
 - b. Type II, Grade 1 Wear Layer Thickness: 0.050 inch (1.27 mm).
 - c. Backing Class A: Fibrous, non-asbestos formulation.
2. Sheet Width: As standard with the manufacturer.
3. Overall Thickness: 0.080 inch (2.0 mm).
4. Wearing Surface: Smooth or embossed.
5. Static Load Limit: 500 psi, per ASTM F970.
6. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
7. Colors and Patterns: As selected by Architect.
8. Seaming Method: Heat welded.
9. Heat-Welding Bead: Solid-strand product as standard with flooring manufacturer. Color of heat-welding beads shall match flooring color.
10. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.2 MANUFACTURERS AND PRODUCTS, STATIC CONTROL VINYL SHEET FLOORING

A. Acceptable Manufacturers:

1. Johnsonite. Product: Granit SD.
2. Armstrong World Industries, Inc.
3. Forbo Industries, Inc.
4. Tarkett, Inc.

5. Mannington Commercial.

B. Vinyl Sheet Materials:

1. Vinyl sheet floor covering with pure carbon coated backing, conforming to ASTM F1303, Type II, Grade 1, Class B.
2. Sheet Width: 78 inches.
3. Wear Layer Thickness: 0.080 inch (2 mm).
4. Wearing Surface: Smooth.
5. Slip Resistance: Greater than 0.5 per ASTM D2047.
6. Electrical Resistance: 1 x 10⁶ ohms to 1 x 10⁹ ohms per ASTM F150.
7. Static Load Limit: 125 psi/800 psi, per ASTM F970, modified.
8. Fire-Test-Response Characteristics:
 - a. Critical Radiant Flux Classification: Class 1 per ASTM E648.
9. Colors and Patterns: As selected by Architect.
10. Base: 6 inch integral self cove base.
11. Seaming Method: Heat welded.
12. Heat-Welding Bead: Solid-strand product as standard with flooring manufacturer. Color of heat-welding beads shall match flooring color.
13. Conductive Adhesive: Water-resistant type as recommended by flooring manufacturer for static control performance at concrete substrate.

1.3 MANUFACTURERS AND PRODUCTS, VINYL COMPOSITION TILE FLOORING

A. Acceptable Manufacturers:

1. Armstrong World Industries, Inc. Product: Standard Excelon, Imperial Texture.
2. Mannington Commercial.
3. Tarkett, Inc.

B. Vinyl Composition Tile Materials:

1. Polyvinyl chloride tile, ASTM F1066, Class 2, through pattern.
2. Size: 12 inches by 12 inches.
3. Thickness: 1/8 inch (3.2 mm).
4. Wearing Surface: Smooth or Embossed.
5. Specular Gloss: 20-40 at 60 degrees.
6. Slip Resistance: ASTM D2047, exceeding 0.5.
7. Static Load Limit: 75 psi.
8. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
9. Colors and Patterns: As selected by Architect.

10. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.4 MANUFACTURERS AND PRODUCTS, VINYL TILE FLOORING

A. Acceptable Manufacturer:

1. Amtico International Inc., Atlanta, GA; 404-267-1900, www.amtico.com. Product: Spacia Woods and Spacia XL.

B. Resilient Tile Materials:

1. Vinyl Tile: ASTM F1700, Class III, Type B.
2. Sizes:
 - a. Spacia: 4 inches x 36 inches.
 - b. Spacia XL: 7-1/4 inches x 48 inches.
3. Wear Layer Thickness: 0.020 inch (0.5 mm).
4. Overall Thickness: 0.10 inch (2.5 mm).
5. Slip Resistance: ASTM D2047, 0.5.
6. Chemical Resistance: ASTM F1700, excellent.
7. Flexibility and Light Stability: Meets ASTM F1700 requirements.
8. Residual Indentation: Meets ASTM F1700 requirements.
9. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
10. Colors and Patterns: As selected by Architect.
11. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.5 MANUFACTURERS AND PRODUCTS, LUXURY VINYL TILE FLOORING

A. Acceptable Manufacturers:

1. Armstrong World Industries, Inc. Product: Natural Creations, ArborArt, EarthCuts, or Mystix.
2. Mannington Commercial.
3. Tarkett, Inc.

B. Luxury Vinyl Tile Materials:

1. Solid polyvinyl chloride tile, ASTM F1700, Class III, Type B, embossed surface.
2. Size: 12 inches by 12 inches.
3. Overall Thickness: 0.125 inch (3.2 mm).
4. Wear Layer Thickness: 0.020 inch (0.5 mm).
5. Finish: UV-cured polyurethane.
6. Slip Resistance: ASTM D2047, exceeding 0.5.

7. Static Load Limit: 250 psi.
8. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
9. Colors and Patterns: As selected by Architect.
10. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.6 MANUFACTURERS AND PRODUCTS, BIOBASED TILE FLOORING

A. Acceptable Manufacturers:

1. Armstrong World Industries, Inc. Product: Migrations.
2. Azrock.

B. BioBased Tile Materials:

1. Conform to ASTM F2982.
2. Size: 12 inches by 12 inches.
3. Thickness: 1/8 inch (3.2 mm).
4. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
5. Colors and Patterns: As selected by Architect.
6. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.7 MANUFACTURERS AND PRODUCTS, STATIC CONTROL VINYL TILE FLOORING

A. Acceptable Manufacturers:

1. VPI, 920-458-4664. Product: Statmate.
2. Armstrong World Industries, Inc. Product: Static Dissipative SDT.
3. Forbo Flooring Inc.
4. Roppe.

B. Static Control Vinyl Tile Materials:

1. Homogeneous solid vinyl tile with encapsulated conductive elements of the carbon family distributed throughout the tile.
2. Size: 12 inches by 12 inches.
3. Thickness: 1/8 inch.
4. Electrical Resistance, Point to Ground: 10^6 ohms to 10^8 ohms, ASTM F150.
5. Electrostatic Propensity: Less than 30 Volts, AATCC-134.
6. Static Decay: 5,000 to 0 Volts in less than 0.2 seconds, Federal Test Method 101C, Method 4046 at fifteen percent relative humidity.

7. Grounding: One 2 inch x 24 inch copper strip installed every 2,000 square feet of uninterrupted tile.
8. Static Load Limit: ASTM F970, 2,500 psi.
9. Fire-Test-Response Characteristics:
 - a. Flame Spread: 75 or less, ASTM E84.
 - b. Smoke Developed: 450 or less, ASTM E662.
 - c. Critical Radiant Flux Classification: 1.08 watts per square centimeter, ASTM E648.
10. Colors and Patterns: As selected by Architect.
11. Conductive Adhesive: Water-resistant type as recommended by flooring manufacturer for static control performance at concrete substrate.

1.8 MANUFACTURERS AND PRODUCTS, NON-PVC RESILIENT SHEET AND PLANK FLOORING

A. Acceptable Manufacturer:

1. Takiron; distributed by Ceres Natural Floors, Division of CBC (America) Corp., Commack, NY; 888-371-8801, www.ceresnaturalfloor.com or 916-791-7061, www.maierandassoc.com. Product: Ceres™ Wels™ Sheet PVC-Free Flooring.

B. Resilient Sheet Materials:

1. Resilient Sheet: Polyolefin resin, non-PVC, plasticiser-free, and chlorine-free resilient flooring.
2. Roll Size: 6 feet by 66 feet.
3. Total Thickness: 0.080 inches (2.0 mm).
4. Passes 10 mm Mandrel test per ASTM F137.
5. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
6. Colors and Patterns: As selected by Architect.
7. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

C. Acceptable Manufacturer:

1. Takiron; distributed by Ceres Natural Floors, Division of CBC (America) Corp., Commack, NY; 888-371-8801, www.ceresnaturalfloor.com or 916-791-7061, www.maierandassoc.com. Product: Ceres™ Sequoia Plank PVC-Free Flooring.

D. Resilient Plank Materials:

2. Resilient Plank: ASTM F1700, Type III, Class B, mineral-based, PVC-free and chlorine-free resilient flooring.
3. Plank Size: 4 inches wide by 36 inches long.
4. Total Thickness: 0.080 inches (2.0 mm).
5. Static Load Limit: 3,000 psi per ASTM F970, modified.

6. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 200 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
7. Colors and Patterns: As selected by Architect.
8. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.9 MANUFACTURERS AND PRODUCTS, NON-PVC RESILIENT TILE FLOORING

A. Acceptable Manufacturer:

1. Amtico International Inc., Atlanta, GA; 404-267-1900, www.amtico.com. Product: Stratica.

B. Resilient Tile Materials:

1. Resilient Tile: Non-PVC, plasticiser-free, and chlorine-free resilient tile flooring.
 - a. Non-PVC Material: Dupont Surlyn™ for wear layer, and polyolefinic resin with inorganic fillers.
 - b. Backing: Mineral filled ethylene copolymer.
2. Size: As selected by Architect.
3. Total Thickness: 0.10 inches (2.5 mm).
4. Wear Layer Thickness: 0.026 inches (0.65 mm).
5. Weight: 3.0 kilograms per square meter.
6. Slip Resistance: ASTM D2047, exceeding 0.5.
7. Chemical Resistance: ASTM F1700, excellent.
8. Flexibility and Light Stability: Meets ASTM F1700 requirements.
9. Residual Indentation: ASTM F1700, less than eight percent.
10. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
11. Collection, Patterns, Colors, and Sizes: As selected by Architect.
12. Adhesive: Water-resistant type, as recommended by flooring manufacturer for substrates indicated.

1.10 MANUFACTURERS AND PRODUCTS, LINOLEUM SHEET FLOORING

A. Acceptable Manufacturers:

1. Forbo Industries, Inc., 800-842-7839. Product: Marmoleum Global 3, Real or Fresco.
2. Gerflor DLW.
3. Tarkett Inc.

B. Linoleum Sheet Materials:

1. Linoleum Sheet: Conforming to ASTM F2034 and the following:
 - a. Backing: Jute.
 - b. Resistance to Bacteria: Material to inhibit bacterial growth, such as staphylococcus aureas.
2. Width: 79 inches.
3. Thickness: 0.10 inch (2.5 mm).
4. Slip Resistance: ASTM D2047, exceeding 0.5.
5. Static Load Limit: 450 psi per ASTM F970.
6. Fire-Test-Response Characteristics:
 - a. Smoke Density: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, ASTM E648 or NFPA 253.
7. Seams: Heat welded.
8. Finish:
 - a. Factory-Applied Finish: Soil-resistant, colorless top coat over cross-linked primer; "Topshield Performance" finish by Forbo; or accepted equal.
 - b. Field-Applied Finish: As standard with flooring manufacturer.
9. Colors and Patterns: As selected by Architect.
10. Heat-Welding Bead: Solid-strand product as standard with flooring manufacturer. Color of heat-welding beads shall match flooring color.
11. Adhesive: Water-based type, as recommended by flooring manufacturer for substrates indicated.

1.11 MANUFACTURERS AND PRODUCTS, LINOLEUM TILE FLOORING

A. Acceptable Manufacturers:

1. Forbo Industries, Inc., 800-842-7839 (Sacramento Area: Contact Joe Mikos, 209-740-7228). Product: Marmoleum Dual Global 3, Elementary.
2. Gerflor DLW.
3. Tarkett Inc.

B. Linoleum Tile Materials:

1. Linoleum Tile: Conforming to ASTM F2195 and the following:
 - a. Backing: Polyester.
2. Size: 13 inches by 13 inches by 0.10 inch (2.5 mm) or 20 inches by 20 inches by 0.10 inch (2.5 mm).
3. Static Load Limit: 1,500 psi per ASTM F970.
4. Fire-Test-Response Characteristics:
 - a. Smoke Density: 450 or less, ASTM E662 or NFPA 258.
 - b. Critical Radiant Flux Classification: Class 1; ASTM E648 or NFPA 253.

5. Finish:
 - a. Factory-Applied Finish: Soil-resistant, colorless top coat over cross-linked primer; "Topshield Performance" finish by Forbo or accepted equal.
 - b. Field-Applied Finish: As standard with flooring manufacturer.
6. Colors and Patterns: As selected by Architect.
7. Adhesive: Water-based type, as recommended by flooring manufacturer for substrates indicated.

1.12 MANUFACTURERS AND PRODUCTS, RUBBER SHEET FLOORING

A. Acceptable Manufacturers:

1. Nora Systems, Inc., Lawrence, MA; 800-332-6672 or 978-689-0530, www.norarubber.com. Product: noraplan sentica, Article 1701.
2. Mondo.

B. Rubber Flooring Materials:

1. Rubber Sheet Material: ASTM F1859; rubber content approximately thirty percent; with natural fillers; free of asbestos, PVC, and halogens.
2. Roll Size: 39.37 feet by 48 inches (12 meters by 1.22 meters)
3. Thickness: 0.12 inch (3 mm).
4. Surface: Smooth.
5. Back of Roll: Smooth, double sanded.
6. Slip Resistance: ASTM D2047, 0.8 or greater.
7. Hardness: ASTM D2240, Shore A, 85 or greater.
8. Rolling Load Limit: 550 psi.
9. Static Load Limit: 800 psi, 0.005 inch or less residual compression per ASTM F970.
10. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
11. Colors and Patterns: As selected by Architect.
12. Wear Warranty: Five years.
13. Environmental Requirements: Product shall meet GreenGuard indoor air quality certification requirements.
14. Heat-Welding Bead: Solid-strand product as standard with flooring manufacturer. Color of heat-welding beads shall match flooring color.
15. Adhesive: Solvent-free, non-flammable, high strength, as recommended by flooring manufacturer for substrates indicated.

1.13 MANUFACTURERS AND PRODUCTS, RUBBER SHEET FLOORING

A. Acceptable Manufacturers:

1. Nora Systems, Inc., Lawrence, MA; 800-332-6672 or 978-689-0530, www.noraflooring.com. Product: noraplan environcare™, Article 1462.

2. Mondo.

B. Rubber Flooring Materials:

1. Rubber Sheet Material: ASTM F1859; rubber content approximately thirty percent; with natural fillers; free of asbestos, PVC, and halogens.
2. Roll Size: 49.2 feet by 48 inches (15 meters by 1.22 meters).
3. Thickness: 0.08 inch (2 mm).
4. Surface: Smooth.
5. Back of Roll: Smooth, double sanded.
6. Slip Resistance: ASTM D2047, 0.8 or greater.
7. Hardness: ASTM D2240, Shore A, 85 or greater.
8. Rolling Load Limit: 450 psi.
9. Static Load Limit: 800 psi, 0.005 inch or less residual compression per ASTM F970.
10. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, per ASTM E648.
11. Colors and Patterns: As selected by Architect.
12. Wear Warranty: Five years.
13. Environmental Requirements: Product to meet GreenGuard indoor air quality certification requirements.
14. Heat-Welding Bead: Solid-strand product as standard with flooring manufacturer. Color of heat-welding beads shall match flooring color.
15. Adhesive: Solvent-free, non-flammable, high strength, as recommended by flooring manufacturer for substrates indicated.

1.14 MANUFACTURERS AND PRODUCTS, RUBBER TILE FLOORING

A. Acceptable Manufacturers:

1. Nora Systems, Inc., Lawrence, MA; 800-332-6672 or 978-689-0530, www.noraflooring.com. Product: norament satara, Article 1880.
2. Mondo.
3. Johnsonite.

B. Rubber Flooring Materials:

1. ASTM F1344, extra heavy duty rubber with natural fillers; free of asbestos and PVC.
2. Tile Size: 39.53 inches by 39.53 inches (1004 mm by 1004 mm).
3. Thickness: 0.14 inch (3.5 mm).
4. Surface: Hammered.
5. Back of Tile: Smooth, double-sanded.
6. Slip Resistance: ASTM D2047, 0.8 or greater.
7. Hardness: ASTM D2240, Shore A, 75 or greater.

8. Rolling Load Limit: 850 psi.
9. Static Load Limit: 800 psi, 0.005 inch residual compression per ASTM F970.
10. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
11. Colors and Patterns: As selected by Architect.
12. Wear Warranty: Ten years.
13. Environmental Requirements: Product to meet GreenGuard indoor air quality certification requirements.
14. Adhesive: Solvent-free, non-flammable, high strength, as recommended by flooring manufacturer for substrates indicated.

1.15 MANUFACTURERS AND PRODUCTS, RUBBER TILE FLOORING

A. Acceptable Manufacturers:

1. Nora Systems, Inc., Lawrence, MA; 800-332-6672 or 978-689-0530, www.noraflooring.com. Product: norament® strada, Article 1870.
2. Mondo.
3. Johnsonite.

B. Rubber Flooring Materials:

1. Rubber Tile Material: ASTM F1344; rubber content approximately 46 percent with natural fillers; free of asbestos, PVC, and halogens.
2. Tile Size: 39.53 inches by 39.53 inches (1004 mm by 1004 mm).
3. Thickness: 0.14 inch (3.5 mm).
4. Surface: Cubic.
5. Back of Tile: Smooth, double sanded.
6. Slip Resistance: ASTM D2047, 0.8 or greater.
7. Hardness: ASTM D2240, Shore A, 75 or greater.
8. Rolling Load Limit: 850 psi.
9. Static Load Limit: 800 psi, 0.005 inch or less residual compression per ASTM F970.
10. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
11. Colors and Patterns: As selected by Architect.
12. Wear Warranty: Ten years.
13. Environmental Requirements: Product to meet GreenGuard indoor air quality certification requirements.
14. Adhesive: Solvent-free, non-flammable, high strength, as recommended by flooring manufacturer for substrates indicated.

1.16 MANUFACTURERS AND PRODUCTS, RUBBER TILE FLOORING

A. Acceptable Manufacturers:

1. Nora Systems, Inc., Lawrence, MA; 800-332-6672 or 978-689-0530, www.noraflooring.com. Product: noraplan environcare™, Article 2462.
2. Mondo.
3. Johnsonite.

B. Rubber Flooring Materials:

1. ASTM F1344, extra heavy duty rubber with natural fillers; free of asbestos and PVC.
2. Tile Size: 24 inches by 24 inches (610 mm by 610 mm).
3. Thickness: 0.08 inch (2.0 mm).
4. Surface: Smooth.
5. Back of Tile: Smooth, double-sanded.
6. Slip Resistance: ASTM D2047, 0.8 or greater.
7. Hardness: ASTM D2240, Shore A, 85 or greater.
8. Rolling Load Limit: 450 psi.
9. Static Load Limit: 800 psi, 0.005 inch or less residual compression per ASTM F970.
10. Fire-Test-Response Characteristics:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux Classification: Class 1, 0.45 watts per square centimeter or greater, ASTM E648.
11. Colors and Patterns: As selected by Architect.
12. Wear Warranty: Five years.
13. Environmental Requirements: Product to meet GreenGuard indoor air quality certification requirements.
14. Adhesive: Solvent-free, non-flammable, high strength, as recommended by flooring manufacturer for substrates indicated.

1.17 MANUFACTURERS AND PRODUCTS, RUBBER STAIR TREADS AND RISERS

A. Acceptable Manufacturers:

1. Roppe. Product: Safe-T-Cork, #98 Vantage Profile without Riser.

B. Stair Tread Materials:

1. Stair Tread: ASTM F2169, Type TS (rubber, vulcanized thermoset), PVC-free.
2. Type: Class 2, raised circular design without riser.
3. Nosing: Square, with abrasive strips, color as selected by Architect.
 - a. Nosing Height: 1-9/16 inches.
4. Sizes: Standard or custom lengths as indicated.
5. Depth: 12 inches, unless otherwise indicated on Drawings.

6. Thickness: 3/16 inch tapering to 1/8 inch.
 - a. Raised Design: 3/64 inch.
 - b. Weight: Two pounds per linear foot.
7. Abrasion Resistance: ASTM D3389, excellent.
8. Slip Resistance: Minimum 0.5, per ASTM D2047.
9. Static Load Limit: ASTM F970, residual compression less than 0.005 inch at 250 pound load.
10. Fire-Test-Response Classification:
 - a. Smoke Developed: 450 or less, ASTM E662.
 - b. Critical Radiant Flux: Class 1, ASTM E648 (NFPA 253).
11. Colors: As selected by Architect.
12. Adhesive: Solvent-free, non-flammable, high strength, as recommended by stair tread manufacturer for substrates indicated.

C. Rubber Riser Materials:

1. Risers: Smooth, flat; material same as treads, produced by same manufacturer as treads.
2. Height: As indicated on Drawings.
3. Thickness: 0.10 inch (2.5 mm).
4. Lengths: Standard or custom lengths as indicated.
5. Colors: As selected by Architect.
6. Adhesive: Solvent-free, non-flammable, high strength, as recommended by riser manufacturer for substrates indicated.

- D. Provide 2-inch contrasting color strips complying with CBC requirements for the visually impaired.

1.18 MANUFACTURERS AND PRODUCTS, RESILIENT WALL BASE

A. Acceptable Manufacturers:

1. Roppe Corporation.
2. Burke Flooring.
3. Johnsonite.

B. Wall Base Materials:

1. Wall Base: ASTM F1861, Type TS, (rubber, vulcanized, thermoset).
2. Style: Cove (base with toe), top set; or straight (flat or toeless), as indicated on Drawings.
3. Height: 4 inches, unless otherwise indicated.
4. Thickness: 1/8 inch, minimum.
5. Lengths: Coils in manufacturer's standard length.
6. Colors: As selected by Architect.

C. Wall Base Accessories:

1. Preformed end stops, and outside corners, of the same material, manufacturer, size, and color as wall base.
2. Adhesive: Water-based type, as recommended by base manufacturer for substrates indicated.

1.19 MANUFACTURERS AND PRODUCTS, ACCESSORIES

A. Subfloor Filler: Portland cement type (at concrete substrate) as recommended by flooring material manufacturer.

1. Acceptable Manufacturer and Products: UZIN products provided by UFLOOR Systems, Inc. or accepted equal.

B. Primers and Adhesives: Water-resistant type, as recommended by flooring, tread/riser, and wall base manufacturers. Flooring adhesives shall be compatible for use over the vapor emission control system installed under Section 07 26 50.

C. Resilient Molding Accessories:

1. Molding Accessories: Rubber, unless otherwise indicated on Drawings. Provide where required or indicated.
 - a. Carpet edge or nosing.
 - b. Nosing for resilient flooring.
 - c. Joiner for tile and carpet.
 - d. Transition strips.
 - e. Reducer strip for resilient flooring.
2. Acceptable Manufacturers:
 - a. Roppe Corporation.
 - b. Burke Flooring.
 - c. Johnsonite.
3. Colors: As selected by Architect.

D. Integral Cove Base Accessories:

1. Cove Strip (Support Strip): 1-inch radius, as recommended by flooring manufacturer.
2. Cap Strip: Metal cap.
 - a. Shape and Color: Square; color as selected by Architect.

E. Seamless-Installation Accessories:

1. Heat-Welding: Solid-strand product for heat welding seams; color to match floor covering.

F. Cleaners, Sealers and Finishes: All cleaners, sealers and finishes to be products of one manufacturer. Use products approved by flooring manufacturers in writing.

1. Acceptable Manufacturers:
 - a. Non-PVC Resilient Tile and Linoleum Flooring: Diversey, Inc., products as listed below; or accepted equal.

- b. Rubber Treads and Risers: Spartan Chemical Co., Inc., Maumee, OH, 800-537-8990 www.spartanchemical.com. Use Spartan products for Roppe products. For other tread/riser products comply with manufacturer's printed instructions.
2. Products for Non-PVC Resilient Sheet, Plank, and Tile Flooring:
 - a. Cleaner: Stride pH neutral cleaner; use for post-installation and routine maintenance.
3. Products for Vinyl Composition Tile, Luxury Vinyl Tile, Biobased Tile, and Vinyl Sheet Flooring:
 - a. Cleaner: Neutral detergent, Armstrong S-485 or accepted equal.
 - b. Floor Polish: Commercial floor polish, Armstrong S-480 or accepted equal.
4. Products for Static Control Vinyl Tile Flooring:
 - a. Cleaner: pH neutral cleaner as recommended by tile manufacturer.
5. Products for Linoleum Flooring:
 - a. Cleaner: Stride neutral cleaner; use for post-installation and routine maintenance.
 - b. Sealer: LinoBase sealer. Sealer not required for specified Forbo products.
 - c. Finish Coating: Two coats of "Carefree" matte floor finish; apply as recommended by flooring manufacturer.
 - 1) Finish coating is not required for Forbo products at the time of installation. Furnish "Carefree" matte floor finish for routine maintenance of Forbo products; quantity as required.
6. Products for Rubber Sheet and Tile Flooring: Wash polish as recommended by flooring manufacturer.
7. Products for Rubber Stair Treads and Risers: Provide the following for Roppe products, unless otherwise recommended by manufacturer. For other tread/riser products comply with manufacturer's printed instructions.
 - a. Cleaner: Shinline Multi-Surface Cleaner.
 - b. Sealer: Shinline Seal with Sheen 17.

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers:

1. Tandus Centiva, Dalton, GA; 800-248-2878, www.tandus.com.
2. Shaw Contract Group, Calhoun, GA; 800-257-7429, www.shawcontractgroup.com.
3. Lees Carpets, a division of Mohawk Industries, Kennesaw, GA; 800-523-5647, www.leescarpets.com.
4. Interface, LaGrange, GA; 800-634-6032, www.interface.com.

1.2 MATERIALS

A. Carpet Tile (C1): Conforming to the following criteria:

1. Size: 18 inches by 18 inches.
2. Construction: Textured Loop.
3. Gauge: 1/10 inch.
4. Pile Units per Inch: 9.6.
5. Pile Height Average: 0.187 inch.
6. Fiber System: TDX Nylon.
7. Dye Method: Solution/Yarn Dyed.
8. Soil/Stain Protection: Ensure.
9. Primary Tufting Substrate: Synthetic, Non-Woven.
10. Overall Recycled Content: 31 percent to 51 percent.
11. ER3 Backing: 100 percent recycled content.
12. Backing Density: 65 pounds per cubic foot minimum (per ASTM D1667).
13. Flammability: Class 1 (CRF: 0.45 watts per square centimeter or higher), per ASTM E648.
14. Smoke Density: NBS Smoke Density (ASTM E662), less than 450.
15. Static Propensity: AATCC-134, 3.0 KV or lower; permanent conductive fiber.
16. Color: As selected by Architect.

1.3 ACCESSORIES

A. Subfloor Filler: Portland cement type (at concrete substrate) as recommended by flooring material manufacturer.

1. Acceptable Manufacturer and Products: UZIN products provided by UFLOOR Systems, Inc. or accepted equal.

B. Primers and Adhesives:

1. Primers: As recommended by carpet tile and adhesive manufacturer.

2. Adhesives: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - a. Adhesives shall be compatible for use over the vapor emission control system installed under Section 07 26 50.
- C. Resilient Wall Base and Transition Strips: Refer to Section 09 65 00 for resilient wall base and transition strips.

END OF SECTION

SECTION 09 68 16

SHEET CARPETING

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers:

1. Tandus Centiva, Dalton, GA; 800-248-2878, www.tandus.com.
2. Shaw Contract Group, Calhoun, GA; 800-257-7429, www.shawcontractgroup.com.
3. Lees Carpets, a division of Mohawk Industries, Kennesaw, GA; 800-523-5647, www.leescarpets.com.
4. Interface, LaGrange, GA; 800-634-6032, www.interface.com.

1.2 MATERIALS

A. Sheet Carpet: Conforming to the following criteria:

1. Size: 6 foot width; roll length as standard with manufacturer.
2. Construction: Level loop.
3. Gauge: 1/13 inch.
4. Stitches per Inch: 8.2.
5. Pile Height Average: 0.117 inch.
6. Density: 32 ounces per cubic yard, minimum, per ASTM D1667.
7. Total Weight: 87.4 +/-5 oz/cu. yd.
8. Fiber System: TDX Nylon.
9. Dye Method: Fifty percent Solution-dyed and fifty percent yarn-dyed.
10. Primary Tufting Substrate: Synthetic, non-woven.
11. Fusion Coat: Thermoplastic sealant polymer.
12. Non-PVC Backing: ethos™ Cushion 100; polyvinyl butyryle;
13. Radiant Panel: Class 1 (CRF: 0.45 watts per square centimeter or higher), per ASTM E648.
14. Smoke Density: Less than 450, per ASTM E662.
15. Static Propensity: AATCC-134: Less than 3.0 KV; Permanent Conductive Fiber.
16. Soil/Stain Protection: Ensure.
17. Pattern: Medium texture.
18. Color: As selected by Architect.
19. Total Recycled Content: 35.7 percent (minimum thirty percent post-consumer).
20. Environmental Certification: California Platinum (California Gold Sustainable Carpet Standard).

1.3 ACCESSORIES

- A. Subfloor Filler: Portland cement type (at concrete substrate); and white premix latex (at wood substrate); as recommended by flooring material manufacturer.
 - 1. Acceptable Manufacturer and Products: UZIN products provided by UFLOOR Systems, Inc. or accepted equal.
- B. Primers and Adhesives:
 - 1. Primers: As recommended by carpet and adhesive manufacturer.
 - 2. Adhesives: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.
 - a. Adhesives shall be compatible for use over the vapor emission control system installed under Section 07 26 50.
- C. Resilient Wall Base and Transition Strips: Refer to Section 09 65 00 for resilient wall base and transition strips.
- D. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

END OF SECTION

SECTION 09 72 00

WALL COVERINGS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Basis-of-Design: RJF International, Inc., Koroseal Wall Coverings, Product: Harborweave II.
- B. Wolf Gordon.
- C. MDC Wall Coverings.
- D. Vicrtex Wall Coverings.

1.2 MATERIALS

- A. Type II supported vinyl material consisting of through pigmented, mold and mildew inhibitorized, polyvinyl chloride film adhered to a pre-shrunk polyester/cotton blend fabric backing.
 - 1. Total Weight: 14 ounces per square yard; 21 ounces per lineal yard
 - 2. Backing Weight: 3 ounces per square yard
 - 3. Fabric Backing and Content: Osnaburg
 - 4. Average Thickness: 9 mils
 - 5. Roll Width: 53/54 inches
 - 6. Recycled Content: Minimum 4 percent pre-consumer recycled film
 - 7. Tensile Strength: 85 x 85 (W x F)
 - 8. Tear Strength: 45 x 45 (W x F)
 - 9. Colorfastness: No change (200 hours)
 - 10. Cleanability: Meets or exceeds ASTM D1308
 - 11. Alkalinity Resistance: No fade in 24 hours in one percent sodium hydroxide for non-metallic decorative effect finishes
 - 12. Mildew Resistance: Zone inhibition rating of zero per ASTM G21
 - 13. Staphylococcus Resistance: 100 percent reduction within 24 hours
 - 14. Stain Resistance: Shows no appreciable effect of staining per FS 191A, Paragraph 4.4.5
 - 15. Fire Hazard Classification: Class A, Flame Spread: 15, Smoke Developed: 20 per ASTM E84
 - 16. Colors: As indicated on Drawings

1.3 ACCESSORIES

- A. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate, water-based type.
- B. Termination Trim: Extruded, clear anodized aluminum.

- C. Substrate Filler: As recommended by adhesive and wall covering manufacturers, compatible with substrate.
- D. Substrate Primer and Sealer: Type recommended by wall covering manufacturer.

END OF SECTION

SECTION 09 72 26
DIGITAL WALL COVERINGS

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers:

1. Koroseal Digital Surfaces, a Division of Koroseal Interior Products, LLC, Fairlawn, OH; 877-539-2557, www.koroseal.com. Product: Option e.
2. MDC Wall Coverings, Glendale Heights, IL; 800-621-4006, www.mdcwall.com. Product: DreamScape Terralon.
3. Wolf Gordon, Inc., Long Island City, NY; 800-347-0550, www.wolf-gordon.com.

1.2 NON-PVC WALL COVERING

A. Materials: Type II non-PVC wall covering material with the following properties:

1. Fabric: 100 percent polyester/natural fiber technology.
2. Backing: Woven Osnaburg.
3. Total Weight: 11.0 ounces per square yard.
4. Roll Width: 54 inches.
5. Tensile Strength: 63 lbf x 50 lbf (MD x CMD).
6. Tear Strength: 56 x 46.
7. Fire Hazard Classification: Class A; as tested in accordance with ASTM E84; flame spread less than 25, smoke developed less than 450.
8. Printing: Single-sided digital printing with eco-solvent and UV inks.
9. Design: Custom design as provided by Architect.

B. Primers: Provide products by Roman Decorating Products, Calumet City, IL; 708-891-0770, www.romandecoratingproducts.com; unless otherwise recommended by wall covering manufacturer.

1. R-35[®] Adhesion Promoting Primer PRO-935 by Roman Decorating Products.
2. ULTRA-PRIME[®] PRO-777 Primer by Roman Decorating Products.
3. ULTRA[®] PLUS Permeable Wallcovering Primer PRO-990 with Mildew Guard[™] by Roman Decorating Products.
 - a. Mold and mildew-resistant.
 - b. VOC: Less than 20 g/L.
 - c. Vapor Permeance: 32 perms.
4. ULTRA[®] PLUS PRO-988 Primer with Mildew Guard[™] by Roman Decorating Products.
 - a. VOC: Less than 15 g/L.

- C. Adhesives: Provide products by Roman Decorating Products, Calumet City, IL; 708-891-0770, www.romandecoratingproducts.com; unless otherwise recommended by wall covering manufacturer.
1. ULTRA® PLUS Clay Adhesive PRO-788 with Mildew Guard™ by Roman Decorating Products.
 - a. Mold and mildew-proof adhesive.
 - b. VOC: 20 g/L, maximum.
 2. ULTRA® PLUS PRO-888 Clear Adhesive with Mildew Guard™ by Roman Decorating Products.
 - a. Clear, mold and mildew-resistant adhesive.
 - b. VOC: 15 g/L, maximum.
 3. ULTRA® PLUS Permeable Wallcovering Adhesive PRO-550 with Mildew Guard™ by Roman Decorating Products.
 - a. Mold and mildew-resistant.
 - b. VOC: 20 g/L, maximum.
 - c. Vapor Permeance: 25 perms.
 4. EXTRA STRENGTH™ Clay Adhesive PRO-732 by Roman Decorating Products.
 - a. VOC: 20 g/L, maximum.
 5. Primer and Adhesive Warranty: Manufacturer's Five-year warranty against loss of adhesion.

1.3 ACCESSORIES

- A. Adhesive: Type recommended by wall covering manufacturer in writing, for use with specific wall covering and substrate.
1. Mildew resistant, non-staining adhesive, water-based type.
 2. VOC Content: 50 g/L or less, when calculated according to 40 CFR 59 (EPA Method 24).
- B. Substrate Filler: As recommended by adhesive and wall covering manufacturers, compatible with substrate.
- C. Substrate Primer and Sealer: Mildew-resistant, type as recommended in writing by wall covering manufacturer.
- D. Seam Tape: As recommended in writing by wall covering manufacturer.

END OF SECTION

SECTION 09 75 00

STONE FACING

PART 1 PRODUCTS

1.1 MANUFACTURERS, PRODUCTS, AND FABRICATORS

- A. Acceptable Stone and Quarry: Trinity River by Ideal Quarry, Mt. Shasta, CA; Contact: Art Horvath, 530-926-1772.
- B. Acceptable Stone Fabricator: Wheeler Zamaroni, Santa Rosa, CA; Contact: Scott Atkinson, 707-292-6508, www.wzsupply.com.
- C. Acceptable Stone Sealer and Cleaner Products and Manufacturer: Dupont StoneTech® Professional, Walnut Creek, CA; 877-786-6383, 888-786-6343, www.stonetechpro.dupont.com.
 - 1. Stone Sealer: Dupont™ StoneTech® Professional BulletProof® Sealer.
 - 2. Cleaners for Sealer Application:
 - a. Acidic Cleaner: Dupont™ StoneTech® Professional Restore™ Acidic Cleaner.
 - b. Alkaline Cleaner, Basis-of-Design Product: Dupont™ StoneTech® Professional Klenzall™ Cleaner by Dupont StoneTech® Professional.
 - 3. Sealer Maintenance Products: Provide one year supply of two cleaning products, a neutral cleaner and a cleaner/sealer, compatible with stone sealer, for Owner's use. Maintenance products shall be products of sealer manufacturer. Include printed instructions for each product
 - a. Neutral Cleaner: Dupont™ StoneTech® Professional Stone and Tile Cleaner.
 - b. Cleaner/Sealer: Dupont™ StoneTech® Professional Revitalizer® Cleaner & Protector.

1.2 STONE

- A. Stone Variety and Source: Peridotite (Igneous Rock, Granitic), Mt. Shasta, California.
- B. Sizes: Random rectilinear sizes, 12 inches by 12 inches minimum, and 24 inches by 36 inches maximum. All stone shall be in 6 inch increments. No stone shall comprise more than ten percent of the stone on a wall. Actual stone sizes shall be as acceptable to Architect.
- C. Thickness: 3-inch stone blocks split into two 1-1/2-inch thick (nominal) panels.
- D. Faces: Split face on exposed side, unfinished saw cut on unexposed face, except as follows:
 - 1. Provide satin (matt) finish, with no visible scratches, at stone wall base.
- E. Edges: Unfinished saw cut on four edges, except as follows:
 - 1. Provide satin (matt) finish, with no visible scratches, at exposed perimeter edges.
- F. Color: Ranging from grey to beige, as selected by Architect.

1.3 ACCESSORIES

- A. Anchors: Provide Kerf Stone Anchors as manufactured by Halfen, or accepted equal. Fabricate anchors from stainless steel, ASTM A240/A240M, Type 304.
 - 1. Fasteners for Stainless-Steel Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.
- B. Dowels: Fabricate dowels from stainless steel, ASTM A276, Type 304.
- C. Anchor Sizes and configurations: As shown on Drawings and as required for vertical and horizontal support of stone and applicable loads.
 - 1. Wire ties are not permitted.
- D. Temporary Setting Shims: Rigid plastic shims, nonstaining to stone, sized to suit joint thickness.
- E. Setting Shims for Direct-Mount Anchoring Systems: Strips of resilient plastic or neoprene, non-staining to stone, of thickness needed to prevent point loading of stone on anchors and of depths to suit anchors without intruding into required depths of pointing materials.
- F. Sealant: Type not detrimental to stone work as specified in Section 07 92 00; color as selected by Architect.
- G. Epoxy: Type as recommended by fabricator; appropriate for use with stainless steel and stone materials by Bonstone Materials Corporation, or accepted equal.
 - 1. Water-Cleanable Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1.4 FABRICATION

- A. General: Fabricate stone as indicated on Drawings and shop drawings, and in compliance with applicable requirements of NBGQA "Specifications for Architectural Granite." Cut accurately for proper fit and clearance.
 - 1. Where items are installed with adhesive or where edges of stone is visible in the finished work, make items uniform in thickness and of identical thickness for each type of item; gage back of stone if necessary.
 - 2. Clean sawed backs of stones to remove rust stains and loose particles.
 - 3. Dress joints straight and at right angle to face, unless otherwise indicated.
 - 4. Cut and drill sinkages and holes in stone for anchors, supports, and lifting devices as indicated or needed to set stone securely in place; shape beds to fit supports.
 - 5. Provide reveals and similar features as needed to accommodate adjacent work.
- B. Fabricate units for uniform coloration between adjacent units and over full area of installation.

1.5 FABRICATION TOLERANCES

- A. Fabrication Tolerances: In accordance with NBGQA "Specifications for Architectural Granite," and as follows:

<u>Characteristic</u>	<u>Tolerance</u>
Overall height and width:	
Dimensions to 10 feet:	Plus or minus 1/8 inch.
Dimensions to 20 feet:	Plus 1/8 inch, minus 3/16 inch.
Difference in diagonal dimensions:	1/8 inch per 6 feet but not to exceed 1/4 inch.
Edge straightness:	Maximum variation of 1/8 inch.
Location of inserts:	Maximum 3/8 inch variation from indicated location.
Location of stone joints:	Maximum 1/8 inch from indicated locations.

1.6 STONE FACING

- A. Arrange panels in shop or other suitable space in proposed orientation and sequence for examination by Architect. Mark units with temporary sequence numbers to indicate position in proposed layout.
1. Lay out one elevation at a time if directed by Architect.
 2. Notify Architect seven days in advance of date and time when layout will be available for viewing.
 3. Provide lighting of similar type and level as that of final installation for viewing layout, unless otherwise directed by Architect.
 4. Rearrange panels as directed by Architect until layout is accepted.
 5. Do not trim non-modular-size units to less than modular size until after Architect's acceptance of layout, unless otherwise directed by Architect.
 6. Mark backs of units and Shop Drawings with sequence numbers based on approved layout. Mark backs of units to indicate orientation of units in completed Work.

END OF SECTION

SECTION 09 75 13
MARBLE FINISHES

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Source Limitations for Marble: Obtain each variety of marble, regardless of finish, from a single quarry with resources to provide materials of consistent quality in appearance and physical properties.
 - 1. For marble types that include same list of varieties and sources, provide same variety from same source for each.
 - 2. Make marble slabs available for examination by Architect.
 - a. Architect will select aesthetically acceptable slabs and will indicate aesthetically unacceptable portions of slabs.
 - b. Segregate slabs selected for use on Project and mark backs indicating acceptance.
 - c. Mark and photograph aesthetically unacceptable portions of slabs as directed by Architect.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Marble anchors and anchoring systems shall meet requirements of ASTM C1242.
- B. Seismic Performance: Marble systems shall withstand the effects of earthquake motions determined according to California Building Code.
 - 1. Component Importance Factor: 1.5.

1.3 MARBLE

- A. Material Standard: Comply with ASTM C503.
- B. Description: Uniform, fine- to medium-grained marble with only slight veining. Color as selected by architect
- C. Cut: Vein or Fleuri.
 - 1. Orientation of Veining: Horizontal or Vertical
- D. Cut marble from one block or contiguous, matched blocks in which natural markings occur.
- E. Finish: Polished or Honed.
- F. Match Architect's samples for color, finish, and other marble characteristics relating to aesthetic effects.

1.4 SETTING MATERIALS

- A. Molding Plaster: ASTM C59/C59M.

- B. Portland Cement: ASTM C150, Type I or Type II.
 - 1. Low-Alkali Cement: Not more than 0.60 percent total alkali when tested according to ASTM C114.
- C. Hydrated Lime: ASTM C207, Type S.
- D. Aggregate: ASTM C144.
- E. Water: Potable.

1.5 GROUT

- A. Grout Colors: Match marble.
- B. Standard Cement Grout: ANSI A118.6, packaged.
 - 1. Grout Type: Unsanded.
- C. Polymer-Modified Tile Grout: ANSI A118.7, packaged.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.
 - 2. Polymer Type: Acrylic resin or ethylene vinyl acetate, in dry, redispersible form, packaged with other dry ingredients.
 - 3. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to packaged dry-grout mix.
 - 4. Grout Type: Unsanded.
- D. Water-Cleanable Epoxy Grout: ANSI A118.3, packaged, chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - a. Custom Building Products.
 - b. Laticrete International, Inc.
 - c. MAPEI Corporation.

1.6 POINTING MORTAR MATERIALS

- A. Colored Portland Cement-Lime Mix: Packaged blend of Portland cement, hydrated lime, and mortar pigments. Use a mix of formulation required to produce color indicated or, if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 10 percent of Portland cement by weight.
 - 1. Manufacturers and Products: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - a. Holcim (US) Inc; Product: Rainbow Mortamix Custom Color Cement/Lime.
 - b. Lafarge North America Inc; Product: Eaglebond.
 - c. Lehigh Cement Company; Product: Lehigh Custom Color Portland/Lime Cement.

- B. Aggregate: ASTM C144, except with 100 percent passing No. 16 sieve.
 - 1. White Aggregates: Natural white sand or ground white stone.
 - 2. Colored Aggregates: Natural-colored sand or ground marble, of color necessary to produce required mortar color.
- C. Water: Potable.

1.7 SEALANTS

- A. Joint Sealants: Manufacturer's standard sealants of characteristics indicated below that comply with applicable requirements in Section 07 92 00 and will not stain the marble they are applied to.
 - 1. Use mildew-resistant joint sealant at plumbing fixtures and for control and expansion joints in toilet rooms and other wet locations.
 - 2. Mildew-Resistant Joint Sealant: Mildew resistant, single component, non-sag, neutral curing, silicone.
 - 3. Joint Sealant: Two-component, non-sag, polyurethane elastomeric; Sikaflex®-2c NS by Sika Corporation or accepted equal.
 - 4. VOC Content: 250 g/L.
 - 5. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 - 6. Colors: Provide colors of exposed sealants to match other joints in marble units adjoining sealed joints unless otherwise indicated.
- B. Sealant for Filling Kerfs: Same sealant used for joints in dimension marble.
- C. Sealant for Filling Kerfs: Single-component, non-sag, urethane sealant; Class 25, Use T and Use M that complies with applicable requirements in Section 07 92 00 and that does not stain marble.
 - 1. Manufacturers and Products: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - a. BASF Building Systems; Product: Sonolastic NP.
 - b. BASF Building Systems; Product: Sonolastic Ultra.
 - c. Sika Corporation; Product: Sikaflex - 1a.
 - d. Tremco Incorporated; Product: Vulkem 116.
 - 2. VOC Content: 250 g/L.
 - 3. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Sealant for Filling Kerfs: Single-component, non-sag, neutral-curing, medium- to high-modulus silicone sealant; Class 25, Use NT and Use M that complies with applicable requirements in Section 07 92 00 and that does not stain marble.
 - 1. Manufacturers and Products: Subject to compliance with requirements, provide products by one of the following manufacturers:

- a. BASF Building Systems; Product: Omniseal 50.
 - b. Dow Corning Corporation; Product: 756 SMS.
 - c. General Electric Company; Product: GE Advanced Materials - Silicones; SilPruf NB SCS9000.
 - d. Tremco Incorporated; Product: Spectrem 2.
2. VOC Content: 250 g/L.
 3. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

1.8 MARBLE ANCHORS AND ATTACHMENTS

- A. Fabricate anchors from stainless steel, ASTM A240 or ASTM A666, Type 304.
 1. Fasteners for Stainless-Steel Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.
- B. Fabricate dowels from stainless steel, ASTM A276, Type 304.
- C. Fabricate anchors from extruded aluminum, ASTM B221, Alloy 6063-T6.
 1. Fasteners for Extruded-Aluminum Anchors: Annealed stainless-steel bolts, nuts, and washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group 1.
- D. Anchor Support Grids: Roll-formed steel channels, of size and shape required for application indicated, formed from galvanized-steel sheet not less than 0.108 inch thick and complying with ASTM A653, G90.
 1. Fittings and Fasteners: System manufacturer's standard components of design, size, and material required to securely attach grids to building structure and marble anchors to grids. Fabricate components in contact with marble from same material specified for anchors.
- E. Wire Tiebacks: No. 9 AWG copper or copper-alloy or 0.120-inch diameter, stainless-steel wire.
- F. Dovetail Slots: Furnish dovetail slots with filler strips of slot size required to receive anchors provided, fabricated from 0.034 inch thick, galvanized-steel sheet complying with ASTM A653, G90.
- G. Direct-Mount Anchoring Systems: Stainless-steel marble anchors designed to be applied directly to wall surfaces [or to metal grids]. System shall be secured to wall framing, furring, or sheet-metal reinforcing strips built into wall with stainless-steel self-drilling screws. Anchors fit into kerfs or holes in edges of marble panels.
 1. Manufacturers and Products: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - a. Halfen Anchoring Systems. Meadow Burke.
 - b. Heckmann Building Products Inc.
 - c. Hohmann & Barnard, Inc.

1.9 MARBLE ACCESSORIES

- A. Temporary Setting Shims: Rigid plastic shims, non-staining to marble, sized to suit joint thickness.
- B. Setting Shims for Direct-Mount Anchoring Systems: Strips of resilient plastic or neoprene, non-staining to marble, of thickness needed to prevent point loading of marble on anchors and of depths to suit anchors without intruding into required depths of pointing materials.
- C. Cleaner: Cleaner specifically formulated for marble types, finishes, and applications indicated, as recommended by marble producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
- D. Marble Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of marble surfaces, as recommended by marble producer for application indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - a. Bostik, Inc.
 - b. Custom Building Products.
 - c. Dupont; Product: StoneTech® Professional BulletProof® Sealer.
 - d. Hillyard, Inc.
 - e. HMK Stone Care; ACI International.
 - f. Miracle Sealants Company.
 - g. Stone Care International.
 - h. Summitville Tiles, Inc.
- E. Sealer Maintenance Products: Provide one year supply of two cleaning products, a neutral cleaner and a cleaner/sealer, compatible with marble sealer, for Owner's use. Maintenance products shall be products of sealer manufacturer. Include printed instructions for each product.
 - 1. Neutral Cleaner, Basis-of-Design Product: Dupont™ StoneTech® Professional Stone and Tile Cleaner by Dupont StoneTech® Professional.
 - 2. Cleaner/Sealer, Basis-of-Design Product: Dupont™ StoneTech® Professional Revitalizer® Cleaner & Protector by Dupont StoneTech® Professional.

1.10 MARBLE FABRICATION, GENERAL

- A. Select marble for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
 - 1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically unpleasing, as judged by Architect.
- B. Fabricate marble units in sizes and shapes required to comply with requirements indicated.
 - 1. Comply with recommendations in MIA's "Dimension Stone - Design Manual VII".

- C. Cut marble units to produce pieces of thickness, size, and shape indicated and to comply with fabrication and construction tolerances recommended by Marble Institute of America.
 - 1. Where items are installed with adhesive or where marble edges are visible in the finished work, make items uniform in thickness and of identical thickness for each type of item; gage back of marble units if necessary.
 - 2. Clean sawed backs of marble units to remove rust stains and iron particles.
 - 3. Dress joints straight and at right angle to face unless otherwise indicated.
 - 4. Cut and drill sinkages and holes in marble for anchors, supports, and lifting devices as indicated or needed to set marble units securely in place; shape beds to fit supports.
 - 5. Provide openings, reveals, and similar features as needed to accommodate adjacent work.
- D. Finish exposed faces and edges of marble units to comply with requirements indicated for finish of each marble type required and to match accepted samples and mockups.
- E. Carefully inspect finished marble units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.
 - 1. Grade and mark marble for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed marble units match range of colors and other appearance characteristics represented in accepted samples and mockups.

1.11 MARBLE WALL PANELING

- A. Arrange panels in shop or other suitable space in proposed orientation and sequence for examination by Architect. Mark units with temporary sequence numbers to indicate position in proposed layout.
 - 1. Lay out one elevation at a time if acceptable to Architect.
 - 2. Notify Architect seven days in advance of date and time when layout will be available for viewing.
 - 3. Provide lighting of similar type and level as that of final installation for viewing layout unless otherwise accepted by Architect.
 - 4. Rearrange panels as directed by Architect until layout is acceptable.
 - 5. Do not trim non-modular size units to less than modular size until after Architect's acceptance of layout, unless otherwise accepted by Architect.
 - 6. Mark backs of units and Shop Drawings with sequence numbers based on approved layout. Mark backs of units to indicate orientation of units in completed Work.
- B. Nominal Thickness: 3/4 inch, 7/8 inch, 1 inch, 1-1/4 inches, or 2 inches, unless otherwise indicated.
- C. Control depth of marble units to maintain minimum clearances of 1 inch between backs of panels and structural members, fireproofing if any, backup walls, and other work behind marble. Do not back check marble less than 1 inch thick.
- D. Cut marble to produce uniform joints 1/16 inch, 1/8 inch, 1/4 inch, or 3/8 inch wide and in locations indicated.

- E. Quirk-miter corners unless otherwise indicated. Fabricate for anchorage in top and bottom bed joints of corner units.
- F. Pattern Arrangement: Fabricate and arrange panels with veining and other natural markings shall comply with the following requirements:
 - 1. Arrange panels with veining horizontal, or
 - 2. Arrange panels with veining vertical, or
 - 3. Arrange panels in blend pattern.
 - 4. Book match units in each course. No matching is required between successive courses, or
 - 5. Slip match units in each course. No matching is required between successive courses.

1.12 MARBLE COLUMN FACING

- A. Nominal Thickness: 3/4 inch, 7/8 inch, 1 inch, 1-1/4 inches, or 2 inches, unless otherwise indicated.
- B. Joints: 1/16 inch wide grouted, 1/8 inch wide grouted, 1/8 inch wide sealant-filled, 1/4 inch wide mortar-pointed, 1/4 inch wide sealant-filled, 3/8 inch wide mortar-pointed, or 3/8 inch wide sealant-filled joints.
- C. Quirk-miter corners unless otherwise indicated. Install anchorage in top and bottom bed joints of corner units.
- D. Pattern Arrangement: Fabricate and arrange panels with veining and other natural markings to comply with the following requirements:
 - 1. Arrange panels with veining horizontal, or
 - 2. Arrange panels with veining vertical, or
 - 3. Arrange panels with veining as indicated on Drawings.

1.13 MARBLE WINDOW STOOLS

- A. Nominal Thickness: 3/4 inch, 7/8 inch, or 1-1/4 inches, unless otherwise indicated.
- B. Edge Detail: Straight slightly eased at corners, 3/8-inch bevel at top edge with bottom corner slightly eased, 3/8-inch radius at top edge with bottom corner slightly eased, 3/4-inch bullnose, or 1-1/2-inch laminated bullnose.
- C. Ends: Extend stools beyond opening as indicated and finish ends to match exposed edge.
- D. Joints: Fabricate in one piece without joints.
- E. Fabricate window stools in one piece unless otherwise indicated.
- F. Assemble window stools that consist of more than one piece by bonding joints with marble adhesive. Mask areas adjacent to joints to prevent adhesive smears. Clamp units to temporary bracing to ensure that window stools are properly aligned and joints are minimum width.

1.14 MIXES

- A. Spotting Plaster: Stiff mix of molding plaster and water.

- B. Mortar, General: Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortar of uniform quality and with optimum performance characteristics.
 - 1. Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated. Do not use calcium chloride.
 - 2. Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer unless otherwise indicated. Discard mortar when it has reached initial set.
- C. Setting Mortar: Comply with ASTM C270, Proportion Specification.
 - 1. Mix Proportions: 1 part Portland cement and 2-1/2 to 4 parts lime with aggregate ratio of 2-1/4 to 3 times the volume of cement and lime.
- D. Pointing Mortar: Comply with ASTM C270, Proportion Specification, for mortar types indicated. Provide pointing mortar mixed to match Architect's sample and complying with the following:
 - 1. Packaged Portland Cement-Lime Mix Mortar: Use Portland cement-lime mix of selected color.
 - 2. Mix Proportions: 1 part Portland cement and 2-1/2 to 4 parts lime with aggregate ratio of 2-1/4 to 3 times the volume of cement and lime.
- E. Grout: Comply with mixing requirements of referenced ANSI standards and with manufacturer's written instructions.

END OF SECTION

SECTION 09 77 10

SANITARY WALL AND CEILING FINISHES

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Marlite. Product: Standard FRP.
- B. Panolam Industries International, Inc., Shelton, CT, 888-375-9255, www.panolam.com.
Product: Classic Collection.

1.2 MATERIALS

- A. Fiberglass Reinforced Plastic Panels (FRP): Pebble Surface, color as selected by Architect, four feet x eight feet x 3/32 inch. Class A Fire Rated; Flame Spread less than 25; Smoke Developed less than 450 per ASTM E84.
 - 1. Sheet size shall be one piece full vertical height from floor to ceiling. "Piecing" of sheets to achieve full height finish will not be allowed.
- B. Accessories and Adhesives: Manufacturer's standard adhesive and aluminum joinery trim system that conceals each vertical joint and exposed edges. Trim color as selected by Architect.

END OF SECTION

SECTION 09 77 23
FABRIC-WRAPPED PANELS

PART 1 PRODUCTS

1.1 MATERIALS

- A. Tackable wall panel substrate: Four foot width x 1/2 inch thickness mineral fiber board; Micore 300 as manufactured by United States Gypsum Company (USG), PINnacle N.C.F.R. as manufactured by Homasote, or accepted equal, conforming to the following:
1. Edge Treatment: Square.
 2. Density: 23±3 pounds per cubic foot, minimum.
 3. Weight: 656-1562 pounds per msf.
 4. Flammability: Class A per ASTM E84.
 - a. Flame Spread: 25.
 - b. Smoke Developed: 20.
- B. Tackable Panel Fabric Wrap:
1. Xorel Dash 6603 pattern as manufactured by Carnegie Fabrics or accepted equal, conforming to the following:
 - a. Content: 100 percent IFR Xorel.
 - b. Width: 56 inches.
 - c. Flame Retardancy: Class A per ASTM E84.
 - d. Color: As selected by Architect.
 2. Xorel Flux 6557 pattern as manufactured by Carnegie Fabrics or accepted equal, conforming to the following:
 - a. Content: 100 percent IFR Xorel.
 - b. Width: 56 inches.
 - c. Flammability: Class A in accordance with ASTM E84.
 - d. Color: As selected by Architect.
 3. Xorel Pop Emboss 6647 pattern as manufactured by Carnegie Fabrics or accepted equal, conforming to the following:
 - a. Content: 100 percent IFR Xorel.
 - b. Width: 56 inches.
 - c. Backing: None.
 - d. Flammability: Class A in accordance with ASTM E84.
 - e. Color: As selected by Architect.
 4. Xorel Quarry 6619 pattern as manufactured by Carnegie Fabrics or accepted equal, conforming to the following:
 - a. Content: 100 percent IFR Xorel.
 - b. Width: 56 inches.

- c. Flame Retardancy: Class A per ASTM E84.
 - d. Color: As selected by Architect.
5. Xorel Meteor 6427 pattern as manufactured by Carnegie Fabrics or accepted equal, conforming to the following:
 - a. Content: 100 percent IFR Xorel.
 - b. Width: 56 inches.
 - c. Backing: Paper.
 - d. Flammability: Class A per ASTM E84.
 - 1) Flame Spread: Less than 25.
 - 2) Smoke Developed: Less than 450.
 - e. Color: As selected by Architect.
6. Constellation LCT-121 pattern as manufactured by Luna Textiles or accepted equal, conforming to the following:
 - a. Content: 100 percent recycled polyester.
 - b. Width: 66 inches.
 - c. Repeat: 11-1/4 inches vertical; 7 inches horizontal.
 - d. Flammability: Class A in accordance with ASTM E84.
 - e. Color: As selected by Architect.
7. Parallel #901180 as manufactured by Maharam or accepted equal, conforming to the following:
 - a. Content: 58 percent post-industrial recycled polyester and 42 percent post-consumer recycled polyester.
 - b. Backing: None.
 - c. Total Weight: 12.9 ounces per linear yard.
 - d. Width: 66 inches.
 - e. Flammability: Class A per ASTM E84.
 - 1) Flame Spread: 10.
 - 2) Smoke Developed: 95.
 - f. Color: As selected by Architect.
8. Tek-Wall as manufactured by Maharam or accepted equal, conforming to the following:
 - a. Content: 51 percent polyolefin, 49 percent polyester.
 - b. Finish: PFOA-Free stain resistant.
 - c. Weight: 18.8 ounces per linear yard.
 - d. Flame Spread: 10.
 - e. Smoke Developed: 20.
 - f. Color: As selected by Architect.
9. Tek-Wall Steward #399547 as manufactured by Maharam or accepted equal, conforming to the following:
 - a. Content: 100 percent polyester.

- b. Finish: PFOA-free stain resistant finish.
 - c. Weight: 14.7 ounces per linear yard.
 - d. Backing: Acrylic.
 - e. Finished Width: 56 inches.
 - f. Flammability: Class A per ASTM E84:
 - 1) Flame Spread: 25 or less.
 - 2) Smoke Developed: 450 or less.
 - g. Color: As selected by Architect.
10. Vertical Wall Solutions, Catalyst as manufactured by LBI/Boyd or accepted equal, conforming to the following:
- a. Content: 100 percent recycled polyester.
 - b. Fiber Finish: Teflon.
 - c. Width: 65 inches/66 inches.
 - d. Repeat: 16.5 inches horizontal; 16.5 inches vertical.
 - e. Flammability Characteristics: Class A per ASTM E84.
 - 1) Flame Spread: Less than 25.
 - 2) Smoke Developed: less than 450.
 - f. Color: As selected by Architect.
11. Bacara Crepe II, Style No. 6054 as manufactured by Designtex or accepted equal, conforming to the following:
- a. Content: 100 percent vinyl.
 - b. Total Weight: 20 ounces.
 - c. Fabric Backing: Osnaburg.
 - d. Roll Width: 54 inches.
 - e. Pattern Repeat: 24 inches vertical; 52 inches horizontal.
 - f. Fire Hazard Classification: Class A, Flame Spread: 15, Smoke Developed: 25 per ASTM E84.
 - g. Color: As selected by Architect.
12. Hayfield Blue Planet, Style No. BBHF21 as manufactured by MDC Wallcoverings or accepted equal, conforming to the following:
- a. Content: 100 percent vinyl – 30 percent recycled content.
 - b. Total Weight: 20 ounces per linear yard.
 - c. Fabric Backing: 100 percent recycled polyester, nonwoven.
 - d. Roll Width: 54 inches.
 - e. Pattern Match: Random non-reversible.
 - f. Fire Hazard Classification: Class A, Flame Spread: 20, Smoke Developed: 115 per ASTM E84.
 - g. Color: As selected by Architect.

13. Len-Tex Contract, Kampala as manufactured by MDC Wallcoverings or accepted equal, conforming to the following:
 - a. Content: Type II, 100 percent vinyl.
 - b. Weight: 21 ounces per linear yard; 14 ounces per square yard.
 - c. Backing: Osnaburg.
 - d. Finished Width: 54 inches.
 - e. Pattern Match: Random reversible.
 - f. Flammability: Class A per ASTM E84:
 - 1) Flame Spread: 5.
 - 2) Smoke Developed: 15.
 - g. Color: As selected by Architect.
14. Bolta Clear Skies BBCS13 as manufactured by MDC Wallcoverings or accepted equal, conforming to the following:
 - a. Content: 100 percent vinyl with 30 percent recycled content.
 - b. Type: Type II.
 - c. Finished Total Weight: 20.0 ounces per lineal yard; 13.33 ounces per square yard.
 - d. Backing: 100% recycled polyester nonwoven.
 - e. Flammability: Class A per ASTM E84.
 - 1) Flame Spread: 20.
 - 2) Smoke Developed: 115.
 - f. Width: 54 inches
 - g. Pattern: Random reversible match.
 - h. Color: As selected by Architect.
15. Bolta Flashy Flash (Recore) as manufactured by MDC Wallcoverings or accepted equal, conforming to the following:
 - a. Type: Type: II.
 - b. Finished Total Weight: 20.0 ounce per lineal yard; 13.3 ounces per square yard.
 - c. Backing: 100% recycled polyester nonwoven.
 - d. Flammability: Class A per ASTM E84.
 - 1) Flame Spread: 20.
 - 2) Smoke Developed: 115.
 - e. Width: 53-54 inches
 - f. Pattern: Non-reversible with random match.
 - g. Color: As selected by Architect.
16. Relay W10203 as manufactured by Knoll Textiles or accepted equal, conforming to the following:
 - a. Content: 100 percent recycled polyester.
 - b. Weight: 12.5 ounces per square yard.
 - c. Backing: Acrylic.

- d. Finished Width: 66 inches.
 - e. Pattern Repeat: 6.75 inches horizontal; 3.25 inches vertical.
 - f. Flammability: Class A per ASTM E84:
 - g. Color: As selected by Architect.
17. Crosstown #2526 as manufactured by Guilford of Maine or accepted equal, conforming to the following:
- a. Content: 77 percent Pre-Consumer recycled polyester.
 - b. Weight: 13.6 ±1.0 ounces per linear yard.
 - c. Width: 66 inches.
 - d. Repeat: 16.2 inches horizontal; 12.5 inches vertical.
 - e. Flammability: Class A per ASTM E84.
 - f. Breaking Strength: 250 pounds minimum warp; 150 pounds minimum fill.
 - g. Tear: 35 pounds minimum warp; 25 pounds minimum fill.
 - h. Color: As selected by Architect.
18. Groove #3497 as manufactured by Guilford of Maine or accepted equal, conforming to the following:
- a. Content: 100 percent Post-Consumer recycled polyester.
 - b. Weight: 15.0 ±1.0 ounces per linear yard.
 - c. Width: 66 inches.
 - d. Repeat: 16.75 inches horizontal; 20.0 inches vertical.
 - e. Flammability: Class A per ASTM E84.
 - f. Breaking Strength: 225 pounds minimum warp; 180 pounds minimum fill.
 - g. Tear: 20 pounds minimum warp; 20 pounds minimum fill.
 - h. Color: As selected by Architect.
19. Chatfield-Clarke, Group 2 standard color range, or accepted equal, conforming to the following:
- a. Type: Type: II
 - b. Total Weight: 21 ounces per linear yard.
 - c. Flame Spread: 15.
 - d. Smoke Developed: 20.
 - e. Color: As selected by Architect.

C. Composition: Fabric wall covering machine laminated to mineral fiber board, wrapped on the vertical edges.

2.2 ACCESSORIES

- A. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate, water based contact type.
- B. Substrate Filler: As recommended by adhesive and wall covering manufacturers, compatible with substrate.

- C. Substrate Primer and Sealer: type recommended by wall covering and tackboard manufacturer.

END OF SECTION

SECTION 09 81 00
ACOUSTIC INSULATION

PART 1 PRODUCTS

1.1 GLASS FIBER INSULATION

A. Acceptable Manufacturers:

1. EcoBatt by Knauf Insulation, Shelbyville, IN; 317-398-4434, www.knaufusa.com.
2. Owens-Corning, Toledo, OH; 800-438-7465, www.owenscorning.com.
3. Certainteed Corp., Insulation Group, Valley Forge, PA; 800-233-8990, www.certainteed.com.
4. Johns Manville, Denver, CO; 800-654-3103, www.specJM.com.
5. Thermafiber, Inc., Wabash, IN; 888-834-2371, www.thermafiber.com.

B. Batt Insulation: ASTM C665 Type I; preformed glass fiber batt; conforming to the following:

1. Facing: Acoustic insulation shall be unfaced.
2. Flame Spread and Smoke Density Properties: 25/450 maximum in accordance with 2016 CBC Section 720, California Referenced Standard Code Chapter 12-13, ASTM E84, and UL 723.
3. Provide formaldehyde-free thermal insulation products.
4. Recycled Content: Minimum thirty percent post-consumer.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 PRODUCTS

1.1 PAINT SYSTEMS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

1.2 ACCEPTABLE MANUFACTURERS – PAINT

- A. Refer to Table at the end of this Section.

1.3 ACCEPTABLE MANUFACTURERS – PRIMER SEALERS

- A. Refer to Table at the end of this Section.

1.4 ACCEPTABLE MANUFACTURERS – STAIN AND CLEAR FINISHES

- A. Refer to Table at the end of this Section.

1.5 MATERIALS

- A. All paint materials shall be provided from a single manufacturer unless noted otherwise in this Section.
- B. Coatings:
1. Ready mixed. Process pigments to a soft paste consistency capable of being readily and uniformly dispersed to a homogeneous coating.
 2. Good flow and brushing properties; capable of drying or curing free of streaks or sags.
- C. All field-applied interior paints shall use zero VOC colorants.
- D. Accessory Materials: All other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

1.6 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule. Colors as selected by Architect.

1.7 PAINTING SCHEDULE – EXTERIOR SURFACES

A. Ferrous Metal:

1. 1st coat – Acrylic Flat Primer
2. 2nd and 3rd coats – 100 percent Acrylic Semi-Gloss

- B. Ferrous Metal (Industrial) – For use at exterior metal architectural features/exposed structure:
 - 1. 1st coat – Epoxy Flat Primer
 - 2. 2nd and 3rd coats – Aliphatic Urethane Gloss Enamel
- C. Galvanized Metal (Handrail and Guardrail Assemblies only):
 - 1. 1st coat – Etch Prep
 - 2. 2nd coat – Epoxy Satin Primer
 - 3. 3rd and 4th coats – High Dispersion Pure Acrylic Polymer
- D. Galvanized Metal and Aluminum (Except Handrail and Guardrail Assemblies):
 - 1. 1st coat – Etch Prep
 - 2. 2nd coat – Acrylic Flat Primer
 - 3. 3rd and 4th coats – 100 percent Acrylic Semi-Gloss
- E. Cement Plaster and Exposed Concrete:
 - 1. 1st coat – Acrylic Flat Primer
 - 2. 2nd and 3rd coats – 100 percent Acrylic Flat
- F. Cement Plaster with Acrylic Finish Coat and Acrylic Soffit Finish:
 - 1. 1st coat – Acrylic Flat Primer
 - 2. 2nd and 3rd coats – 100 percent Acrylic Flat
- G. Masonry (CMU):
 - 1. 1st coat – Acrylic Block Filler Primer
 - 2. 2nd and 3rd coats – 100 percent Acrylic Flat

1.8 PAINTING SCHEDULE – INTERIOR SURFACES

- A. Gypsum Board:
 - 1. 1st coat – PVA Primer Sealer
 - 2. Texture per Section 09 29 00
 - 3. 2nd coat – PVA Primer Sealer
 - 4. 3rd and 4th coats – Acrylic Semi-Gloss Enamel
- B. Gypsum Board – Typical paint system at toilet rooms, storage rooms, and kitchens, for use where no texture is to be applied:
 - 1. 1st coat – PVA Primer Sealer
 - 2. 2nd and 3rd coats – Acrylic Semi-Gloss Enamel
- C. Gypsum Board:
 - 1. 1st coat – PVA Primer Sealer
 - 2. Texture per Section 09 29 00
 - 3. 2nd coat – PVA Primer Sealer
 - 4. 3rd and 4th coats – Acrylic Eggshell Enamel

D. Gypsum Board - for use where no texture is to be applied:

1. 1st coat – PVA Primer Sealer
2. 2nd and 3rd coats – Acrylic Eggshell Enamel

E. Gypsum Board:

1. 1st coat – Acrylic Flat Primer
2. 2nd and 3rd coats – Waterborne Semi-Gloss Epoxy

F. Wood (Opaque finish):

1. 1st coat – Acrylic Flat Primer
2. 2nd and 3rd coats – Acrylic Semi-Gloss Enamel

G. Wood (Transparent Finish):

1. 1st coat – Low VOC Alkyd Flat Stain
2. 2nd coat – Low VOC Alkyd Semi-Gloss Sanding Sealer
3. 3rd and 4th coats – Acrylic Satin Polyurethane Varnish or Alkyd Gloss Polyurethane Varnish

H. Ferrous Metal:

1. 1st coat – Acrylic Flat Primer
2. 2nd and 3rd coats – Acrylic Eggshell Enamel

I. Ferrous Metal:

1. 1st coat – Acrylic Flat Primer
2. 2nd and 3rd coats – Acrylic Semi-Gloss Enamel

J. Galvanized Metal, Zinc Alloy Metal, and Aluminum:

1. 1st coat – Etch Prep
2. 2nd coat – Acrylic Flat Primer
3. 3rd and 4th coats – Acrylic Eggshell Enamel

K. Galvanized Metal, Zinc Alloy Metal, and Aluminum:

1. 1st coat – Etch Prep
2. 2nd coat – Acrylic Flat Primer
3. 3rd and 4th coats – Acrylic Semi-Gloss Enamel

APPLICATION	TYPE	MPI Gloss Level	MANUFACTURERS				
			Dunn Edwards	PPG Paints	Sherwin Williams	Kelly Moore/Devoe	Vista
PRIMERS							
Exterior Ferrous Metal	Acrylic	G1	BRPR00-1	4020	B66W01310	5725	9600
Exterior Ferrous Metal (Industrial)	Epoxy	G1	Carboline Rustbond	Amerlock2 VOC	B58W00620	Bar-Rust 235V	Carboline Rustbond
Exterior Galvanized Metal and Aluminum (Except Handrail and Guardrail Assemblies)	Acrylic	G1	ULGM00	4020	B66W01310	5725	4800
Exterior Galvanized Metal (Handrail and Guardrail Assemblies Only)	Epoxy	G1	ULGM00	98-46	B58 646-100	Tru-Glaze 4030	4800
Exterior Cement Plaster System with Acrylic Finish Coat and Acrylic Soffit Finish	Acrylic	G1	ESPR00	6001	A24W351	250	4600
Exterior Cement Plaster and Concrete	Acrylic	G1	ESPR00	6001	A24W08300	247	4600
Exterior Masonry (Block Filler)	Acrylic	G1	SBPR00	3010	B42W00150	521	040
Interior Gypsum Board with Epoxy Paint Finish	Acrylic	G1	Carboline Sanitile 120	1000	B28 2600 ProMar 200 Zero	971	Carboline Sanitile 120
Zero VOC Interior Gypsum Board and Wood	Acrylic	G1	VNSL00	9-900	B28 2600	971	5001
Interior Gypsum Board	PVA	G1	VNSL00	1030	B28 2600	971	5001
Interior Wood	Acrylic	G1	IKPR00	1000	B28W8111	973	4200
Interior Ferrous Metal	Acrylic	G1	BRPR00	4020	B66W01310	5725	9600
Interior Galvanized Metal and Aluminum	Acrylic	G1	UGPR00 or GAPR00	4020	B66W00001	5725	4800
FINISHES							
Exterior Ferrous and Galvanized Metal, Aluminum (Except Handrail and Guardrail Assemblies)	100 percent Acrylic	G5	SSHL50	2406V	A76W51 Solo	1250	7000
Exterior Ferrous Metal (Industrial)	Aliphatic Urethane Enamel	G6	Carbothane 134VOC	Amershield	Acrolon 100	Devthane 379H	Carbothane 134VOC
Exterior Galvanized Metal (Handrail and Guardrail Assemblies Only)	High Dispersion Pure Acrylic	G5	ASHL50	4216	B66W0600	Devcryl 1448	8400
Exterior Cement Plaster with Acrylic Finish Coat, Concrete, and Acrylic Soffit Finish	Elastomeric	G1	EDLX10	2260	A5W451	1128	1900
Exterior Cement Plaster and Concrete	Elastomeric	G1	EDLX10	2260	A5W451	1128	1900
Exterior Masonry	100 percent Acrylic	G1	SSHL10	2200V	A-80-1100	1240	2800
Interior Gypsum Board	Waterborne Epoxy	G5	Carboline Sanitile 255	Tru-Glaze WB 4406	B73W00311	Tru-Glaze-WB 4406	Carboline Sanitile 255
Zero VOC Interior Gypsum Board and Wood	100 percent Acrylic	G3	SZRO30	9-300	B09W01051	1510	7500
Zero VOC Interior Gypsum Board and Wood	100 percent Acrylic	G5	SZRO50	9-500	B10W01051	1520	7000
Interior Gypsum Board and Wood	100 percent Acrylic	G3	SZRO30	1402N	B20W01960	1610	7500
Interior Gypsum Board and Wood	100 percent Acrylic	G5	SZRO50	6-8510	A76W53 Solo	1650	7000
Interior Ferrous Metal, Galvanized Metal, and Aluminum	100 percent High Performance Acrylic	G3	EVSH30	4212	A75 Solo	1686	8300
Interior Ferrous Metal, Galvanized Metal, and Aluminum	100 percent High Performance Acrylic	G5	EVSH50	4216	B66W00651 HP Acrylic	5885	8400
MISCELLANEOUS							
Interior Wood Stain	Low VOC	G1	Old Masters	ZAR Ultra	MinWax 250	Old Masters Water	Old Masters

	Alkyd		W-B Stain	Max Wood Stain		Based Stain	W-B Stain
Interior Wood Sanding Sealer	Low VOC Alkyd	G5	Old Masters W-B Sanding Sealer	ZAR Ultra Max Sanding Sealer	Gemini Gem Coat 210-0022	Old Masters Water-Based Sanding Sealer	Old Masters W-B Sanding Sealer
Interior Wood Varnish	Acrylic Urethane	G4	Old Masters W-B Poly	ZAR Ultra MAX Satin	A68F00090	Old Master Water-Based Polyurethane	Old Masters W-B Poly
Interior Wood Varnish	Acrylic Urethane	G5	Old Masters W-B Poly	ZAR Ultra Max Semi-Gloss	A68V00091	Old Master Water-Based Polyurethane	Old Masters W-B Poly
Exterior Heavy Duty Cleaner	Water-Based	N/A	Krud Kutter Gloss-Off	88		Devprep 88	Krud Kutter Gloss-Off
Exterior and Interior Galvanized Metal Etch Prep.	N/A	N/A	Krud Kutter Metal Clean and Etch, Dissco Eco-Prime 100, or Jasco Prep & Prime				

END OF SECTION

SECTION 10 11 00
VISUAL DISPLAY SURFACES

PART 1 PRODUCTS

1.1 ACCEPTABLE MANUFACTURERS

A. Claridge Products and Equipment, Inc. Products:

1. Fixed Markerboards and Tackboards: Series 5, Type C Combination, sizes as indicated on Drawings.
2. Horizontal Sliding Markerboards: HSXXX Series.
3. Framed Magnetic Marker Walls: Model No. MW2, sizes as indicated on Drawings.
4. Bulletin Boards: Contemporary Cabinets, Model No. 2041.

B. Aarco Products Inc.

C. Platinum Visual Systems.

1.2 MATERIALS

A. Fixed Markerboards:

1. Outer Face Sheet Steel: 24 gauge steel with LCS (porcelain enamel) face.
2. Aluminum Extrusions: ASTM B221, 6063 alloy, T-5 temper.
 - a. Frame: Manufacturer's standard profile; concealed fasteners.
 - b. Chalk Tray: Manufacturer's standard profile; one piece, full length of markerboard with end closures; concealed fasteners.
 - c. Map Rail: Continuous 1 inch map rail with cork insert and end stops at each end of markerboard.
3. Core: 7/16 inch Medium Density Fiberboard (MDF) or 7/16 inch Duracore, composed of 100 percent recycled wood fiber.
4. Foil Backing: Aluminum foil sheet, 0.005 inch thick.
5. Adhesives: Type recommended by manufacturer.
6. Splice Joint: Extruded aluminum exposed "H" type, with chalk surfacing applied.

B. Horizontal Sliding Markerboards:

1. Markerboards: As specified in this Section.
 - a. Fixed back panel with two sliding panels on two tracks.
2. Hardware:
 - a. Heavy duty aluminum housing with satin anodized finish.
 - b. Sliding panels shall be top-suspended and glide over aluminum track on molded nylon rollers.
 - c. Rollers: Nylon ball bearing rollers at top of unit and nylon guide rollers at bottom of unit.

C. Magnetic Marker Walls:

1. Porcelain enamel LCS³ marker walls shall be manufactured in accordance with Porcelain Enamel Institute's specification. Porcelain enamel finish shall be fusion bonded to a steel substrate at temperature necessary to reduce steel and porcelain stresses and achieve superior enamel bond and hardness. Panels shall have strong magnetic holding capability. Color as indicated on Drawings.
2. Core Material: 7/16 inch thick MDF with steel spline joint bar.
3. Panel Backing: Moisture barrier back.
4. Laminations: Hot-type neoprene contact adhesive applied to both surfaces automatically. Each substrate shall have a minimum of 80 percent covering with 1.5 to 2.0 dry mils of adhesive. Panel components shall have uniform pressure applied mechanically over entire area. Laminations shall be made by face sheet manufacturer.
5. Provide matched butt joint edge.
6. Aluminum Extrusions: ASTM B221, 6063 alloy, T-5 temper.
 - a. Frame: Manufacturer's standard profile; concealed fasteners.

D. Tackboards:

1. Tackboard Covering: Vinyl coated fabric wallcovering.
2. Aluminum Extrusions: ASTM B221, 6063 alloy, T-5 temper.
 - a. Frame: Manufacturer's standard profile; concealed fasteners.
3. Core: 7/32 inch cork over 1/4 inch hardboard.
4. Adhesives: Type recommended by manufacturer.
5. Splice Joint: Extruded aluminum "H" type, with fabric wrapped surface.

E. Bulletin Boards:

1. Aluminum Extrusions: ASTM B221, 6063 alloy, T-5 temper.
 - a. Frame: Manufacturer's standard profile; concealed fasteners.
 - b. Tackable Back Panel: 1/4 inch thick natural cork.
 - c. Doors: 3/16 inch tempered clear glass in aluminum frames with flat key tumbler locks, continuous piano hinges and weatherproofing seals.

1.3 FINISHES

- A. Porcelain Enamel: Glass-fibered enamel, baked to vitreous surfaces; Porcelain Enamel Institute Type A; color: Claridge No. 100 White.
- B. Aluminum Frames and Accessories: Anodized to clear finish.
- C. Tackboard Surface: Vinyl wallcovering, color as selected by Architect.
- D. Bulletin Board Tackable Surface: Cork, color as selected by Architect.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. WeidnerCA, Sacramento, CA; phone: 916-452-8000, URL: www.weidnerca.com.
2. ASI-Modulex, Dallas, TX; phone: 800-274-7732, URL: www.asisign.com.
3. In Pro Corporation, Muskego, WI; phone: 800-222-5556, URL: www.inprocorp.com.
4. Mohawk Sign Systems, Inc., Schenectady, NY; phone: 518-842-5303, URL: www.mohawksign.com.
5. APCO, Atlanta, GA; phone: 404-688-9000, URL: www.apcosigns.com.
6. Diverse ID, Tampa, FL; phone: 877-446-2374, URL: www.diverseid.com.

1.2 MATERIALS

- A. Acrylic Plastic: Non-glare finish acrylic with integral color as manufactured by Romark, Rohm and Haas, CYRO Industries Acrylite FF, or accepted equal. Thickness shall be 1/4 inch at door mounted restroom signs and 1/8 inch minimum at all other locations, unless noted otherwise. Colors as selected by Architect from manufacturer's full range of colors.
- B. Aluminum: ASTM B209 for sheet or plate; ASTM B221 for extrusions, and ASTM B26/B26M for castings. Aluminum extrusions shall be 1/8 inch thick minimum. Wall and post mounted panels shall be 0.080 inch thick minimum. Aluminum panels shall have an acrylic polyurethane paint finish.
- C. Steel Posts: ASTM A53/A53M, Type E or S, Grade B; galvanized 1-1/2 inch nominal pipe size (NPS), Schedule 40. Provide 1/8 inch thick steel cap (ASTM A283/A283M) welded to top of post. Galvanize post and cap to minimum G50 in accordance with ASTM A123/A123M.
- D. Anchors and Fasteners: Stainless steel conforming to ASTM F593.

1.3 EXTERIOR SIGNAGE

- A. Accessible Signage: Provide the following signages in accordance with 2010 ADA Standards for Accessible Design and 2016 CBC where indicated on the Drawings.
 1. Entrance to Parking Lot Sign: 17 inches wide by 22 inches high (minimum) metal panel, reflectorized sign mounted on a single post with text "UNAUTHORIZED VEHICLES PARKED IN DESIGNATED ACCESSIBLE SPACES NOT DISPLAYING DISTINGUISHING PLACARDS OR SPECIAL LICENSE PLATES ISSUED FOR PERSONS WITH DISABILITIES WILL BE TOWED AWAY AT OWNERS EXPENSE. TOWED VEHICLES MAY BE RECLAIMED AT _____ OR BY TELEPHONING _____."
 - a. Blank Space Text: Coordinate text requirement for blank spaces with Owner.

2. Accessible Parking Stall Sign: Provide a 12 inch wide by 18 inch high metal panel, reflectorized International Symbol of Accessibility sign, mounted on a single post, at every accessible parking stall indicated on the Drawings. Text shall occur below the symbol and read "PARKING ONLY".
 3. Van Accessible Parking Stall Sign: Provide a 12 inches wide by 18 inches high metal panel, reflectorized International Symbol of Accessibility sign, mounted on a single post for each van accessible parking stall as indicated on the Drawings. Text shall occur below the symbol and read "PARKING ONLY". Mounted on the same post, below this sign, a sign of the same width and required height shall display the text "VAN ACCESSIBLE". Refer to Drawings for additional sign information.
 4. Sign for Parking Violation Fine: An additional sign or additional language below the symbol of accessibility shall state "Minimum Fine \$250".
 5. Accessible Route Signage: Provide where accessible route of travel diverges from the regular circulation path along or leading to an accessible route of travel, entrance or facility. Sign shall display the International Symbol of Accessibility, shall indicate the direction to accessible entrances and facilities, and shall comply with the requirements of CBC Sections 11B-216 and 11B-703.
 6. Building Entrance: Provide a 6-inch square International Symbol of Accessibility plaque for public entrances where indicated on the Drawings.
 - a. Minimum 1/8 inch thick, non-glare finish acrylic with integral color and inlaid copy.
 7. Functional Room Signage: Provide acrylic plastic room signage with inlaid characters raised 1/32-inch, upper case, sans serif type with corresponding contracted Grade 2 Braille. Raised characters shall be at least 5/8 inch high, but no higher than 2 inches. Color selections from manufacturer's full range of colors. Characters and symbols shall contrast with their background per CBC Section 11B-703.
- B. No Smoking Signage: Provide no smoking signage. Text for signs:
1. "NO SMOKING WITHIN 25 FEET OF BUILDING".
 2. "DESIGNATED SMOKING AREA".
- C. Exterior Metal Dimensional Characters:
1. Manufacturers:
 - a. Gemini Sign Letters.
 - b. Or accepted equal.
 2. Material: ASTM B209 laser cut or water jet cut aluminum plate or ASTM B26/B26M #514 alloy cast aluminum.
 3. Size: As indicated on Drawings.
 4. Font: Helvetica Medium, all capital letters, 1 inch thick, 5/8 inch thick strokes.
 5. Characters Required: Refer to Drawings.
 6. Finish: Clear, bronze, black, gold anodized finish or factory paint finish.

1.4 INTERIOR SIGNAGE

- A. Accessible Signage: Provide the following signages in accordance with 2010 ADA Standards for Accessible Design and 2016 CBC where indicated on Drawings:
1. Material: Acrylic plastic, edges rounded, chamfered, or eased. Corners shall have minimum radius of 1/8 inch.
 2. Color: Characters, symbols, and pictograms on contrasting background per CBC Section 11B-703. Colors as selected by Architect from manufacturer's full range of colors.
 3. Restroom Signage:
 - a. Men's Restroom Symbol (door mounted): Provide for each men's restroom door an equilateral triangle, 1/4 inch thick with 12 inch long sides, vertex pointing upward. Provide an international symbol of accessibility centered on the triangle at accessible restrooms. The color of the triangle symbol shall contrast with the door color, either light on a dark background or dark on a light background.
 - b. Men's Restroom Sign (wall mounted): Provide for each men's restroom a 6 inch wide by 10 inch high acrylic plaque with an international symbol of accessibility centered at the top of the sign; 5/8 inch high by 1/32 inch raised, inlaid characters below to read "MEN"; corresponding contracted Grade 2 Braille 3/8 inch minimum to 1/2 inch maximum below text.
 - c. Women's Restroom Symbol (door mounted): Provide for each women's restroom door a circle, 1/4 inch thick and 12 inches in diameter. Provide an international symbol of accessibility centered on the circle at accessible restrooms. The color of the circle symbol shall contrast with the door color, either light on a dark background or dark on a light background.
 - d. Women's Restroom Sign (wall mounted): Provide for each women's restroom a 6 inch wide by 10 inch high acrylic plaque with an international symbol of accessibility centered at the top of the sign; 5/8 inch high by 1/32 inch raised, inlaid characters below to read "WOMEN"; corresponding contracted Grade 2 Braille 3/8 inch minimum to 1/2 inch maximum below text.
 - e. Unisex Restroom Symbol (door mounted): Provide for each unisex restroom door a circle, 1/4 inch thick and 12 inches in diameter with a 1/4 inch thick equilateral triangle with a vertex pointing upward superimposed on the circle and within the 12 inch diameter. Provide an international symbol of accessibility, centered on the triangle at restrooms equipped for the disabled. The triangle symbol shall contrast with the circle, either light on a dark background or dark on a light background. The circle symbol shall contrast with the door color, either light on a dark background or dark on a light background.
 - f. Unisex Restroom Sign (wall mounted): Provide for each unisex restroom a 6 inch wide by 10 inch high acrylic plaque, with an international symbol of accessibility centered at the top of the sign; 1 inch high by 1/32 inch raised text below to read "RESTROOM"; with corresponding contracted Grade 2 Braille 3/8 inch minimum to 1/2 inch maximum below text.
 4. Functional Room Signage: Provide room signage with inlaid characters raised 1/32-inch, upper case, sans serif type with corresponding contracted Grade 2 Braille. Raised characters shall be at least 5/8 inch high, but no higher than 2 inches. Characters and symbols shall contrast with their background per CBC Section 11B-703.

5. Assistive Listening Signage: Provide sign notifying availability of assistive listening system, 13 inch wide by 8 inch high acrylic plaque with international symbol of access for hearing loss in compliance with CBC Figure 11B-703.7.2.4 imprinted centered at the top of the sign and characters below with text "ASSISTIVE LISTENING DEVICE AVAILABLE".
6. Tactile Exit Signage:
 - a. Provide tactile exit signs at doors in rooms or areas that require more than one exit or exit access per CBC Sections 1013.1 and 1013.4.
 - b. Acrylic plaque tactile exit signs shall have text at least 5/8 inch high, but no higher than 2 inch high, and corresponding contracted Grade 2 Braille shall be placed a minimum of 3/8 inch and a maximum of 1/2 inch directly below the text as follows:
 - 1) Each grade-level exterior exit door that is required to comply with CBC Section 1013.1 shall be identified by a tactile exit sign with the word "EXIT".
 - 2) Each exit door that is required to comply with CBC Section 1013.1, and that leads directly to a grade-level exterior exit by means of a stairway or ramp shall be identified by a tactile exit sign with the following words as appropriate: "EXIT STAIR DOWN", "EXIT RAMP DOWN," "EXIT STAIR UP," or "EXIT RAMP UP." At exit discharge level, door sign shall include a raised five-pointed star located to the left of the identifying floor level.
 - 3) Each exit door that is required to comply with CBC Section 1013.1, and that leads directly to a grade-level exterior exit by means of an exit enclosure or an exit passageway shall be identified by a tactile exit sign with the words "EXIT ROUTE".
 - 4) Each exit access door from an interior room or area to a corridor or hallway that is required to comply with CBC Section 1013.1 shall be identified by a tactile exit sign with the words "EXIT ROUTE".
 - 5) Each exit door through a horizontal exit that is required to comply with CBC Section 1013.1 shall be identified by a tactile exit sign with the words "TO EXIT".

B. Room Capacity Signs: Provide room capacity sign. Text for sign "MAXIMUM OCCUPANT LOAD ____ BY ORDER OF THE STATE FIRE MARSHAL".

1. Blank Space Text: Coordinate text requirement for blank spaces with Architect prior to sign fabrication and installation.

C. Trash/Recycle Signage:

1. Size: As indicated on Drawings.
2. Font: PlazaDReg Book, 2-1/2 inches high.

1.5 LIFE SAFETY SIGNAGE

A. Exit Signs: Internally illuminated exit signs conforming to NFPA 101, Section 7.10.7; UL listed in accordance with UL 924, with wording in legible characters not less than 4 inch high and text "EXIT".

1.6 FABRICATION

A. Work shall be assembled in the shop, as far as practical, ready for installation at the site. Work that cannot be shop assembled be trial fit in the shop to ensure proper field assembly.

- B. Drill or punch holes for bolts and screws; produce clean, true lines and surfaces.
- C. Acrylic signs shall have inlaid acrylic copy/characters and Braille symbols as described in this Section.
- D. Aluminum welding shall be in accordance with AWS D1.2. Steel welding shall be in accordance with AWS D1.1. Welding shall be continuous along the entire area of contact. Grind smooth exposed welds.
- E. Galvanized items shall be hot-dip process after fabrication if practical in accordance with ASTM A123/A123M.
- F. Exposed work surfaces shall have a smooth finish and exposed riveting shall be flush. Fastenings shall be concealed where practical.
- G. Joints exposed to the weather shall be formed to exclude water. Provide drainage and weep holes to prevent condensation buildup.

1.7 SHOP FINISHING

- A. Surfaces of miscellaneous metal work, except nonferrous metal, corrosion resisting steel, and zinc-coated work, shall be given one coat of zinc-molybdate primer or an accepted rust-resisting treatment and metallic primer in accordance with manufacturer's standard practice.
- B. Surfaces to be embedded in concrete shall not be painted.
- C. Upon completion of work, damaged surfaces shall be recoated.

END OF SECTION

SECTION 10 21 13.33

SOLID PHENOLIC TOILET COMPARTMENTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Bobrick, 1082.67P DuraLine Series floor mounted, overhead braced compartments.
2. Knickerbocker Partition Corporation, Metropolitan Series.
3. Global Partitions, Embassy Series.
4. Bradley, Sentinel Series 400.

1.2 MATERIALS

- A. Doors, panels, pilasters, and urinal screens shall be solid one piece phenolic black, plastic core with high pressure matte melamine surface fused to the core. Finish color as selected by Architect.
- B. Leveling devices shall be chromate treated and zinc plated steel.
- C. Pilaster shoes shall be Type 304 stainless steel with #4 satin brushed finish.
- D. Headrails shall be etched and anodized extruded aluminum.

1.3 FABRICATION

- A. Pilasters, doors, and urinal screens shall be 3/4 inch thick. Door edges shall be machined and finished smooth with a fifteen degree beveled edge.
- B. Divider panels shall be 1/2 inch thick. Panel edges shall be machined and finished smooth with a fifteen degree beveled edge.
- C. Panels and doors shall be 58 inches high and mounted 12 inches above finished floor for toe clearance per CBC Section 11B-604.8.1.4.
- D. Leveling Devices: An inverted stirrup with a jack bolt, for leveling during installation and permanent height adjustment, shall be welded within the base of each pilaster. "L" brackets shall be coupled to the stirrup bracket and floor for full range adjustment.
- E. Pilaster shoes shall be one-piece, 3 inches high minimum. Top shall have 90 degree return to pilaster. Shoes shall be fastened to pilasters with concealed retainer clips.
- F. Headrails and headrail returns shall have anti-grip profile, clamp over pilasters, and be secured to walls with stainless steel brackets.

1.4 HARDWARE

A. Door Hardware:

1. Sliding door latch and keeper shall be stainless steel, surface mounted with emergency egress feature. Latch shall require less than five pound force to operate and top of latch shall be mounted at 44 inches above finished floor.

2. Through-bolted, stainless steel, tamper resistant fasteners shall be used at latch keeper-to-pilaster connections.
 3. Concealed heavy duty Type 304 stainless steel pin and barrel hinges with field adjustable cam.
 4. Door shall be furnished with two 11 gauge stainless steel door stop plates with attached rubber bumpers to resist door from being kicked in/out beyond pilaster.
 5. Provide clothes hook on inside of each stall of door. Mount top of hook at 48 inches above the finished floor at all accessible stalls.
 6. Provide U-shaped door pulls and wall stop for outswinging doors. Equip accessible doors with inside and outside pulls. Pulls shall be located directly below the latch. Door hardware shall be mounted between 34 inches to 44 inches above finished floor.
 7. Accessible water closet compartment shall be equipped with a door that has a self-closing device and shall have a clear, unobstructed opening width of 32 inches when located at the end and 34 inches when located at the side with the door positioned at an angle of 90 degrees from its closed position per CBC Section 11B-604.8.1.2.
- B. Miscellaneous Hardware:
1. U-channels at pilasters and walls, full height 18 gauge type 304 satin finish stainless steel.
 2. Angle brackets shall be furnished to secure pilasters to walls and panels to walls.
 3. Fasteners at locations connecting panels to pilasters shall utilize through-bolted, stainless steel, tamper resistant fasteners.
 4. Wall mounted urinal screen brackets shall be full length double ear heavy, clear anodized Type 6463-T5 alloy extruded aluminum.

END OF SECTION

SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Basis-of-Design: Construction Specialties, Inc., Lebanon, NJ; 888-621-3344, www.c-sgroup.com.
2. Pawling Corporation.
3. InPro Corporation.
4. Koroseal Wall Protection Systems, RJF International Corporation.

1.2 RESILIENT CORNER GUARDS

A. Corner Guard: 90 degree, surface-mounted, impact-resistant corner guard, consisting of snap-on PVC-free engineered PETG cover over aluminum retainer.

B. Basis-of-Design Product: Acrovyn® 4000 Model SM-20AN by Construction Specialties Inc.

C. Materials and Properties:

1. Impact-Resistant Cover: Fire retardant, high-impact PVC-free engineered PETG extrusion.
2. Profile: Minimum 0.078-inch thick PVC-free engineered PETG, 90 degree surface-mounted corner guard with nominal 3-inch long legs and 1/4-inch corner radius.
3. Height: As indicated on Drawings.
4. Color: As selected by Architect.
5. Texture: Shadow grain texture.
6. Aluminum Retainer: Continuous aluminum extrusion, ASTM B221, alloy 6063-T6, minimum 0.062 inch thick.
7. Impact Resistance: Comply with ASTM F476 requirements.
8. Chemical and Stain Resistance: Comply with ASTM D543 requirements.
9. Fire-Resistive Rating: Class A, flame spread 25 or less, smoke developed 450 or less; in accordance with ASTM E84.

D. Top and Bottom Caps: Prefabricated, PVC-free plastic; color matching cover; field adjustable for close alignment with snap-on cover.

1.3 RESILIENT BUMP RAILS

A. Bump Rail: Surface-mounted, impact-resistant bump rail, consisting of snap-on PVC-free engineered PETG cover over recycled PVC-free engineered PETG continuous retainer and aluminum wall clips.

B. Basis-of-Design Product: Acrovyn® 4000 Model BCR-50N by Construction Specialties Inc.

C. Materials and Properties:

1. Impact-Resistant Cover: Fire retardant, high-impact PVC-free engineered PETG extrusion.
2. Profile: Minimum 0.078-inch thick PVC-free engineered PETG, radiused cover with 1-1/16 inch projection from wall surface.
3. Height: 5 inches.
4. Color: As selected by Architect.
5. Texture: Shadow grain texture.
6. Aluminum Retainer: Continuous aluminum extrusion, ASTM B221, alloy 6063-T6, minimum 0.062 inch thick.
7. Impact Resistance: Comply with ASTM F476 requirements.
8. Chemical and Stain Resistance: Comply with ASTM D543 requirements.
9. Fire-Resistive Rating: Class A, flame spread 25 or less, smoke developed 450 or less; in accordance with ASTM E84.

D. End Caps: Prefabricated, PVC-free plastic; color matching cover; field adjustable for close alignment with snap-on cover. End caps shall be mechanically fastened with concealed fasteners.

1.4 WALL PROTECTION SHEETS

A. Interior Wall Surface Protection: Rigid, impact-resistant PVC-free engineered PETG sheets, adhesively applied to gypsum board wall surfaces.

B. Basis-of-Design Product: Acrovyn® 4000, 0.060-inch thick rigid sheet by Construction Specialties Inc.

C. Materials and Properties:

1. Impact-Resistant Rigid Sheet: Fire retardant, high-impact, rigid PVC-free engineered PETG sheet.
2. Profile: Minimum 0.060-inch thick PVC-free engineered PETG, rigid, flat sheet.
3. Dimensions: Nominal four feet wide by eight feet high or four feet wide by ten feet high, as applicable to design condition.
4. Color: As selected by Architect.
5. Texture: Suede texture.
6. Impact Resistance: Comply with ASTM F476 requirements.
7. Chemical and Stain Resistance: Comply with ASTM D543 requirements.
8. Anti-Bacterial
9. Fire-Resistive Rating: Class A, flame spread 25 or less, smoke developed 450 or less, in accordance with ASTM E84.

D. Mounting: Mounting shall be by construction grade, water-based, VOC compliant primer and adhesive, supplied by wall protection sheet manufacturer.

E. Mounting Height: As indicated on the Drawings.

- F. Trim: Provide manufacturer's vertical joint, wainscot, outside corner, and inside corner trim in color to match wall protection sheet color.

END OF SECTION

SECTION 10 28 13
TOILET ACCESSORIES

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Bobrick.
- B. American Specialties, Inc.
- C. Bradley.

1.2 MATERIALS

- A. Stainless Steel Sheet: ASTM A167, Type 304.
- B. Tubing: ASTM A269, stainless steel.
- C. Fasteners, Screws, and Bolts: Hot dip galvanized, tamperproof.
- D. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

1.3 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from single sheet of stock, free of joints.
- C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- D. Back paint components where contact is made with building finishes to prevent electrolysis.
- E. Shop assemble components and package complete with anchors and fittings.
- F. Provide steel anchor plates, adapters, and anchor components for installation.
- G. Hot dip galvanize exposed and painted ferrous metal and fastening devices.

1.4 FACTORY FINISHING

- A. Stainless Steel: No. 4 satin luster finish.

END OF SECTION

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers and Products:

1. J.L. Industries, Inc., Bloomington, MN; phone: 800.554.6077; fax: 952.835.2218; URL: www.activarcpg.com/jl-industries. Products:
 - a. Fire Extinguishers: Cosmic Series, Model No. 5E.
 - b. Cabinets:
 - 1) Non-Rated: Ambassador Series, Model No. 1817W10.
 - 2) Fire-Rated: Ambassador Series, Model No. 1817W10FX2.
 - c. Fire Extinguisher Wall Brackets: Model No. MB818C.
2. Larsen's Manufacturing Co., Minneapolis, MN; phone: 763.571.1181; fax: 763.571.6900; URL: www.larsensmfg.com.
3. Potter-Roemer, Santa Ana, CA; phone: 800.366.3473; fax: 888.404.7960; URL: www.potterroemer.com.

1.2 EXTINGUISHERS

- A. Dry Chemical Type, UL 299, five pound capacity, enameled steel tank, with pressure gauge; minimum 3A-40B:C Rating.

1.3 CABINETS

- A. Metal: Formed sheet steel, primed 18 gauge thick base metal, semi-recessed.
- B. Door Glazing: 1/8 inch thick clear acrylic.
- C. Cabinet Hardware: Cylinder lock with break-away handle at 48 inches maximum above finished floor. Handle shall be in compliance with CBC Section 11B-309.4 and shall not require more than five pounds force to operate.
- D. Cabinet Mounting Hardware: Appropriate to cabinet.

1.4 FABRICATION

- A. Form cabinet enclosure with right angle inside corners and seams. Form perimeter trim and door stiles.
- B. Pre-drill for anchors.
- C. Hinge doors for 180 degree opening with continuous piano hinge. Provide roller type catch.
- D. Weld, fill and grind components smooth.

1.5 FINISHES

- A. Extinguisher: Manufacturer's standard finish.

- B. Cabinet Exterior Trim and Door: Manufacturer's standard finish. Provide vertical white lettering stating "FIRE EXTINGUISHER".
- C. Cabinet Interior: White baked enamel paint finish.
- D. Wall Bracket: Red baked enamel paint finish.

END OF SECTION

SECTION 10 51 00

LOCKERS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Acceptable Manufacturers:
1. Lyon Workspace Products.
 2. Republic Storage Products, LLC.
 3. Penco Products, Inc.

1.2 MATERIALS

- A. Sheet Steel: ASTM A653/A653M galvanized to G90 coating, stretcher leveled; to the following minimum thicknesses:
1. Body and Shelf: 24 gauge.
 2. Door Face: 16 gauge.
 3. Door Frame: 16 gauge.
 4. Hinges: 14 gauge.

1.3 ACCESSORIES

- A. For Each Locker: Three single prong wall hooks and metal number plate.

1.4 FABRICATION

- A. Locker Body: Formed and flanged; with steel stiffener ribs; electric spot welded.
- B. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
- C. Doors: Hollow construction, manufacturer's standard thickness, channel reinforced top and bottom.
- D. Hinges: Two for doors under 42 inches high; three for doors over 42 inches high; pop rivet securely to locker body and door.
- E. Locking devices supplied by Owner, except as noted below.
1. Accessible Lockers: Latch and locking hardware at accessible lockers shall not require twisting, pinching or grasping, or more than five pounds of force to operate per CBC Section 11B-309.4. Product: NextLock Range Series keypad and RFID lock with vertical body style, pin-connected rear unit and ADA compliant keys for use with vertical locking bars as manufactured by Digilock or accepted equal.
- F. Provide ADA compliant bottom riser kit and ADA compliant signage at accessible lockers.
- G. Number Plates: Provide rectangular shaped plates. Form numbers 3/8 inch high of block font style, in contrasting color.
- H. Provide ventilation openings at top and bottom of each locker.

- I. Form recess for operating handle and locking device.
- J. Finish edges smooth without burrs.

1.5 FINISH

- A. Clean, degrease, and neutralize metal; prime and finish with one coat of baked enamel. Color as selected by Architect from manufacturer's standard colors.

1.6 BENCHES

- A. Locker Room benches with the following characteristics:
 - 1. Sizes:
 - a. Standard: 9-1/2 inches deep x 17-1/2 inches high x lengths as indicated on Drawings, with a minimum of two pedestals per bench.
 - b. Accessible: 48 inches long x 24 inches deep x 17-1/2 inches high, with four pedestals per bench. Freestanding benches shall have 48 inch long x 18 inch tall fixed backrests with steel support framing.
 - 2. Benchtops and Backrests: 1-1/4 inch thick laminated hardwood with two coats of acrylic clear finish. All corners and edges shall be rounded and sanded.
 - 3. Pedestals: 1-1/4 inch outside diameter tubing uprights with 10 gauge steel flanges welded to each end. Finish and Color: Same as lockers.

END OF SECTION

SECTION 10 56 13
METAL STORAGE SHELVING

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. InterMetro Industries Corporation. Product: Metro Heavy Duty Solid Shelving.
 - 1. Shelves: Model #1836HFG.
 - 2. Posts: Model #74HPC.
- B. Western Pacific Storage Solutions. Product: RiveTier II, 4 feet wide by 2 feet deep by 7 feet high, 4 shelves with 400 pound capacity each.
- C. Republic Storage Systems, LLC.
- D. Tensco.
- E. Quantum Storage Systems.

1.2 EQUIPMENT

- A. Solid Shelving Units: 16 gauge galvanized flat steel shelves, 1-5/8 inch diameter steel posts with shelf adjustability in 2 inch increments. Each shelving unit shall be 18 inches deep x 36 inches long x 76 inches high.
- B. Finish/Color: As selected by Architect from manufacturer's standard selections.

END OF SECTION

SECTION 10 71 13
EXTERIOR SUN CONTROL DEVICES

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. The Airolite Company.
2. C/S Group.
3. Ametco.
4. ASCA, Inc.

1.2 MATERIALS

- A. Aluminum Extrusions: 6063-T5 alloy or T-52 extruded aluminum members complying with ASTM B221 in the configuration indicated on the Drawings.
- B. Aluminum Sheet: Alloy 3003 or 5005 with temper as required for forming complying with ASTM B209, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: 300 Series stainless steel or aluminum of alloy to match alloy of metal to be fastened.
 1. Use types and sizes to suit installation conditions.
 2. Use Phillips flat-head screws for exposed fasteners, unless otherwise indicated.
- D. Anchors and Inserts: Of type, size and material required for loading and installation indicated. Provide nonferrous metal or hot-dip galvanized anchors and inserts.
- E. Bituminous Paint: At dissimilar metals, use cold-applied asphalt mastic complying with SSPC-Paint 12 or cold-applied asphalt emulsion complying with ASTM D1187.

1.3 COMPONENTS

- A. Blade: 6 inch aluminum airfoil blade.
- B. Outrigger: Tapered aluminum plate.
- C. Fascia: Aluminum channel.

1.4 ACCESSORIES

- A. Sealants: As specified in Section 07 92 00.

1.5 FABRICATION

- A. Assemble sun control assemblies in the factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

- B. Sun control assemblies shall be assembled by welding. Components shall be joined with a minimum of two fillet welds, each one-inch long produced with the Pulsed Gas Metal Arc Welding (GMAW/MIG) process with minimum 0.125 inch throat.
- C. Maintain equal sun control blade spacing, including separation between blades and frames to produce a uniform appearance.
- D. Provide and install supports, anchorages and accessories required for a complete assembly.
- E. Join frame members to one another and to fixed sun control blades with fillet welds concealed from view, unless size of sun control assembly makes concealed, bolted connections between frame members necessary.

1.6 FINISHES

- A. All aluminum extrusions shall have Architectural Class I finish per Aluminum Association Standard AA-M12 C22 A41, clear anodized or AA-M12 C22 A44, bronze or black anodized complying with AAMA 611, 0.7 mil minimum thickness

END OF SECTION

SECTION 10 73 16

METAL CANOPIES

PART 1 PRODUCTS

1.1 PRODUCTS AND MANUFACTURERS

A. Acceptable Manufacturers:

1. Basis-of-Design: Mapes Architectural Canopies, Inc., Lincoln, NE; 888-273-1132, www.mapes.com. Products:
 - a. Super Lumideck hanger rod canopies.
 - b. Cantilever Super Lumideck canopies
 - c. SuperShade sun control louver canopies.
2. Eide Industries Inc.; Cerritos, CA; 800-422-6827, www.tensionstructures.com.
3. Austin Mohawk Inc., Utica, NY; 800-211-6534, www.austinmohawk.com.

1.2 MATERIALS

- A. Decking, beams, posts and fascia shall be ASTM B221 extruded aluminum, alloy 6063-T6.

1.3 WALKWAY CANOPY

A. Aluminum Components:

1. Support Columns and Gutter Beams: Columns shall be notched to create a "saddle" to receive and secure gutter beams.
2. Decking: Interlocking extruded aluminum members with field applied mechanical fasteners.
 - a. Size: 2-3/4 inch extruded aluminum, 0.078 inch thickness.
3. Beams and Posts: Mechanically assembled utilizing 3/16-inch fasteners with a minimum shear stress of 350 pounds. Pre-welded or factory-welded connections are not acceptable
 - a. Beams: 4-inch by 7-inch by length indicated on Drawings.
 - b. Posts: 4-inch by 4-inch by length indicated on Drawings.
4. Fascia: Manufacturer's standard extruded 6-inch style.

- B. Concealed Drainage: Water shall drain from covered surfaces into intermediate trough and be directed to standard post drain.

- C. Finish: White baked enamel.

1.4 HANGER ROD CANOPIES

A. Components:

1. Decking: 2-3/4 inch deep x 6 inch wide x 0.078 thickness interlocking extruded 6063-T6 aluminum flat soffit.
2. Fascia: 8 inch deep "G" style, 0.125 extruded 6063-T6 aluminum.
3. Support Beams: 3.31 inch x 3.31 inch x 0.25 extruded aluminum "I" beams.

4. Hanger Rods and Hardware: 1 inch diameter schedule 40 steel pipe; 1/4 inch thick steel angles and plates; drop-forged 5/8 inch steel clevis; 5/8 inch x 6 inch steel threaded rods; steel bolts, nuts, and washers as standard with manufacturer.
5. Wall Fasteners:
 - a. 1/2 inch diameter steel thru eyebolts with steel washers, nuts and backing plates.
 - b. 1/2 inch diameter steel hex bolts with 7/8 inch outside diameter steel pipe spacers and 1/2 inch double machine bolt anchors.
 - c. Escutcheon Plates: 7 inch by 7 inch extruded aluminum.
6. Drainage: Concealed integral gutters and fascia drains with 0.032 aluminum scuppers.
7. Finishes:
 - a. Aluminum: Clear anodized.
 - b. Steel: Two coat Kynar paint system, color to match clear anodized aluminum.

1.5 CANTILEVER CANOPIES

A. Components:

1. Decking: 2-3/4 inch deep x 6 inch wide x 0.078 thickness interlocking extruded 6063-T6 aluminum flat soffit.
2. Fascia: 8 inch deep "J" style, 0.125 extruded 6063-T6 aluminum.
3. Hanger Tubes: 3 inch x 3 inch x 0.25 tube steel welded to 8 inch x 7 inch x 0.50 steel plate.
4. Wall Fasteners:
 - a. 1/2 inch diameter steel thru threaded rods with steel washers, nuts, and 3 inch diameter x 0.25 inch backing plates.
5. Drainage: Concealed integral gutters and fascia drains with 0.032 aluminum scuppers and 2-1/2 inch x 3 inch roll-formed aluminum downspouts.
6. Finishes:
 - a. Aluminum: Class I clear anodized.
 - b. Steel: Two coat Kynar paint system, color to match clear anodized aluminum.
 - c. Steel Fasteners: Cadmium plated.

1.6 SUN CONTROL LOUVER CANOPIES

A. Components:

1. Decking shall consist of 0.110 inch extruded aluminum "Z" louver blades.
2. Intermediate framing members shall be extruded aluminum, alloy 6063-T6.
 - a. Size: 1-1/2 inches x 4-7/16 inches x 3/4 inch x 0.125 inch thickness x 2 feet 11-3/8 inches long.
3. Fascia shall be standard extruded 8 inch Style "J".
4. Hanger Rods and Hardware: 1 inch diameter schedule 40 steel pipe; 1/4 inch thick steel angles and plates; drop-forged 5/8 inch steel clevis; 5/8 inch x 6 inch steel threaded rods; 3 inch diameter x 0.25 inch steel backing plate at wall, steel bolts, nuts, and washers as standard with manufacturer.
5. Extruded aluminum front clip angles.

6. Extruded aluminum rear clip angles.
 - a. Size: 2 inches x 2 inches x 0.1875 inch thickness x 8 inches long.
7. Wall Fasteners:
 - a. 1/2 inch diameter steel thru eyebolts with steel washers, nuts and backing plates.
 - b. 1/2 inch diameter steel hex bolts with 7/8 inch outside diameter steel pipe spacers and 1/2 inch double machine bolt anchors.
8. Cantilever supported brackets shall be standard finish.
9. Finishes:
 - a. Aluminum: Class I clear anodized.
 - b. Steel: Two coat Kynar paint system, color to match clear anodized aluminum.

1.7 ACCESSORIES

- A. Anchors, Fasteners, Fittings, Hardware, and Installation Accessories: Complying with performance requirements indicated and suitable for exposure conditions, supporting structure, anchoring substrates, and installation methods indicated.

END OF SECTION

SECTION 10 75 00

FLAGPOLES

PART 1 PRODUCTS

1.1 ACCEPTABLE MANUFACTURERS

A. Flagpoles:

1. L.Ph. Bolander & Sons, San Francisco, CA; 800-434-5611, www.bolanderflagpole.com.
Product: Catalog #HTJ30, one-piece, 30-foot exposed height flagpole.
2. Baartol Company, Kenton, OH; 800-558-6044, www.baartol.com.
3. American Flagpole, Abingdon, VA; 800-368-7171, www.americanflagpole.com.

B. Flags:

1. The Flag Company, Inc., Acworth, GA; 800-962-0956, www.flagco.com.
2. Annin & Co., Roseland, NJ; 973-228-9400, www.annin.com.
3. The Flag Zone, Gilbertsville, PA; 800-976-4201, www.theflagzone.com.

1.2 POLE MATERIALS

- ###### A. Aluminum Tube: ASTM B241; 6063 alloy, T6 tempered.

1.3 POLE FABRICATION

- ###### A. All flagpoles shall be of one-piece construction.
- ###### B. Outside Butt Diameter: 6 inches.
- ###### C. Outside Top Diameter: 3-1/2 inches.
- ###### D. Nominal Wall Thickness: 0.188 inch.

1.4 FLAGPOLE COMPONENTS

- ###### A. Internal Halyard and Truck Assembly: Provide pole with an internal halyard system including a manually operated cam cleat, a halyard of 5/16-inch diameter, braided, UV-resistant polypropylene rope, and a concealed revolving truck assembly. Halyard and cam cleat shall be serviced through a flush hinged or non-hinged access door with a continuously reinforced periphery.
1. Provide a hinged access door assembly. Door shall hinge on a heavy-duty piano hinge and shall be secured with a cylinder lock.
 2. Provide a non-hinged access door assembly. Door assembly shall have an oval casting peripherally welded into the flagpole shaft, ground smooth, and heat treated. Door shall be secured with a cylinder lock.
 3. Interior Platform: Provide 24-inch or longer round, solid piece of flexible plastic foam to serve as a platform inside the flagpole tube. Foam shall be adhesively attached to tube wall at two feet below the door opening.
 4. The halyard device shall permit a flag to be raised, lowered and flown from any position on the pole without entanglement or slippage.

5. The flag attachment arrangement shall consist of a beaded cable sling encircling the pole and a counterweight to assure descent of flags in all weather conditions. Provide with vinyl-covered bronze or stainless steel snap hooks.
 - a. Provide additional snap hooks as required for attachment of second flag if two flags are mounted on the same cable.
- B. External Halyard and Truck Assembly: Ball-bearing, non-fouling, revolving truck assembly of cast metal with continuous 5/16-inch diameter, braided polypropylene halyard and 9-inch cast-metal cleats with fasteners. Finish exposed metal surfaces to match flagpole.
 1. Provide two halyards and two cleats at each flagpole.
 2. Provide cast-metal cleat covers, finished to match flagpole, secured with cylinder locks.
 3. Provide halyard covers consisting of a 2-inch channel, 60 inches long, finished to match flagpole.
 4. Halyard Flag Snaps: Provide two stainless-steel swivel snap hooks per halyard.
 - a. Provide flag snaps with vinyl covers.
- C. Flags:
 1. Material: Polyester, 100 percent, two-ply, spun, woven fabric.
 - a. Flag of the United States of America: Embroidered stars, sewn stripes, double-stitched; heavy-duty, non-shrink canvas header; and brass grommets.
 - b. Flag of the State of California: Printed graphics; heavy-duty, non-shrink canvas header; and brass grommets.
 2. Quantity and Size: Provide flags as follows, unless otherwise indicated on Drawings.
 - a. For a single flag: One three-foot by five-foot, four-foot by six-foot, or five-foot by eight-foot flag of the United States of America.
 - b. For two-flag applications: One four-foot by six-foot flag of the United States of America, and one four-foot by six-foot flag of the State of California.
- D. Finial Ball: Flush-seam ball, spun aluminum, 0.0641-inch wall thickness, minimum; 6 inches diameter.

1.5 MOUNTING COMPONENTS

- A. Foundation Tube: AASHTO M-36, corrugated tube, 16 gauge (uncoated metal thickness 0.060-inch, minimum) steel, galvanized, with 3/8-inch thick welded plates for setting; tube depth as indicated.
- B. Lightning Protection: Grounding rod (spike), 3/4-inch diameter, welded to foundation tube assembly.
- C. Pole Base Attachment: Flush; aluminum base with cover.

1.6 ACCESSORIES

- A. Non-shrink, Non-metallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107.
- B. Sand: ASTM C33, fine aggregate.

C. Elastomeric Joint Sealant: Single-component non-sag urethane or single-component neutral-curing silicone joint sealant complying with requirements in Section 07 92 00 for "Use NT (non-traffic)" and for "Use M, G, A," and, as applicable to joint substrates indicated, for "Use O."

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

1.7 ALUMINUM FINISHES

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

1. Protection of Dissimilar Surfaces: Coat dissimilar metals and metal surfaces in contact with concrete with bituminous paint.

B. Aluminum Surfaces Except Finial – Select one of the following:

1. Architectural Class I finish per Aluminum Association Standard AA-M10C22,

a. Color – Provide one of the following:

1) A41, clear anodized (Class I, 0.018 mm or thicker coating)

2) A42/A44, bronze or black anodized (Class I, 0.018 mm or thicker coating)

3) A32/A34, bronze or black anodized (Class II, 0.010 mm or thicker coating)] complying with AAMA 611.

2. Natural Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

3. Directional sanded satin finish, as standard with manufacturer.

C. Finial Ball: Gold anodized finish; AAMA 611, AA-M32C22A43 (Class I, 0.018 mm or thicker); gold color.

END OF SECTION

SECTION 10 82 13

ROOF SCREENS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturer:

1. RoofScreen Mfg., Inc., Santa Cruz, CA; 866-766-3727, www.roofscreen.com.

1.2 MATERIALS

- A. Square Base Supports: Weldments fabricated from cold rolled steel conforming to ASTM A1008, fabricated with pre-punched holes in base plate for fastening to roof structure. After fabrication, apply minimum 2 to 4 mil baked on powder coat primer.
1. Height 12 inches.
- B. Square Base Support Extensions: Fabricated from same material and finish as base supports.
1. Height 3 inches.
- C. Square Base Cap: Weldments fabricated from AISI Type 304 stainless steel with mill finish, and fabricated to overlap base support and flashing boot a minimum of 2 inches. Provide moment resisting adjustable connection to attach framing to base cap.
- D. Square TPO Roof Flashing: Fabricated from 60 mil, white, single ply TPO sheet conforming to ASTM D6878. Provide with base flange that extends a minimum of 5 inches onto the roof surface on all four sides. Riser shall be tapered to allow easy fit over Square Base Supports with minimal gap at top of flashing. Hot weld all seams for water tightness.
- E. Base Cap Gasket: EPDM with self-adhesive closed cell foam.
- F. Framing: Carbon steel structural tubing in manufacturer's standard sizes, conforming to ASTM A500 with manufacturer's standard galvanized coating conforming to ASTM B117 salt spray testing. Provide with wall thickness as determined by structural calculations.
- G. Connector Fittings: Fabricated from AISI Type 304 stainless steel with mill finish.
- H. Steel Hat Channel: Steel sheet conforming to ASTM A653, Class SS, with a G90 hot-dip galvanized coating.
- I. Hardware: Bolts, nuts and washers: 18-8 stainless steel.
- J. Self-Drilling Screws: Carbon steel with factory applied protective coating conforming to ASTM B117 salt spray testing.
- K. Welding Materials: AWS D1.1; type required for materials being welded.
- L. Panels:
1. Profile: Flush Panel.
 2. Base Metal: Minimum 24 gauge Galvalume steel sheet, AZ50, conforming to ASTM A792 for painted and unpainted panels.

3. Finish:
 - a. PVDF fluoropolymer, 1 mil, 2 coat, 70 percent.
 - b. Siliconized polyester thermoset coating, 0.90 mil minimum dry film thickness.
 - c. Color as selected by Architect from manufacturer's standard color range, 20 colors minimum.
 - d. Coat reverse side with off-white primer coat.
4. Panel Fasteners: No. 14 self-tapping sheet metal screw. Color coat heads to match panel color.
5. Panel Trim: Same material and finish as panel.

1.3 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- E. Fabricate system components so that portions of screen can be dismantled for repairs to equipment being screened and for future roof replacement.
- F. Trim and Closures: Fabricated from 24 gauge metal and finished with the manufacturer's standard coating system.

END OF SECTION

SECTION 10 90 10
TV MONITOR MOUNTS

PART 1 PRODUCTS

1.1 MANUFACTURERS

- A. Lucasey Manufacturing Corporation, Oakland, CA; 510-534-1435; www.lucasey.com.
Product: LC6X4WTM Security Wall Mount with Tilt.
- B. Peerless Industries, Inc.

1.2 FEATURES

- A. Maximum Load Capacity: 150 pounds.
- B. Finish: Gloss black baked-on powder coat paint finish.
- C. Mounting Range: 20 inch to 65 inch flat panel TV monitors.
- D. Tilt Range: 0 degrees to 12 degrees.
- E. Wall Plate Size: 24.6 inches by 17.5 inches.
- F. Depth of Mount: 2.5 inches.
- G. Provide fastener kit for metal studs as standard with manufacturer.

END OF SECTION

SECTION 11 31 13
KITCHEN APPLIANCES

PART 1 PRODUCTS

1.1 OVEN

- A. Basis-of-Design Product: Whirlpool Model #RBD305PVS.
- B. General Electric.

1.2 COOKTOP

- A. Basis-of-Design Product: Jenn Air Model #JGC1536ADS.
- B. General Electric.

1.3 REFERIGERATORS

- A. Basis-of-Design Product: Whirlpool Model #W1TXNMFWQ.
- B. General Electric.

1.4 MICROWAVE

- A. Basis-of-Design Product: Whirlpool Model #GT4175SPS.
- B. General Electric.

1.5 DISHWASHER

- A. Basis-of-Design Product: Bosch Model #SHE55M05UC.
- B. General Electric.

1.6 MATERIALS

- A. Provide all rough-in hardware, supports and connections, attachment devices, closure trim, and accessories necessary for a complete installation.
- B. Finish Hardware: Manufacturer's standard.
- C. Service Outlet Covers and Escutcheons: Stainless Steel.

1.7 FABRICATION – GENERAL

- A. Install rubber or nylon button feet on bearing surface of any item positioned on a finished surface.
- B. Isolate rotating or reciprocating machinery to prevent noise and vibration.
- C. Stainless Steel Fastenings and Fittings: Bolt and screw with countersunk flat heads at visible or accessible surfaces. Use concealed fastenings where possible.

1.8 FINISHES

- A. All Components: Factory pre-finished.

END OF SECTION

SECTION 11 52 13.26
ELECTRIC PROJECTION SCREENS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Da-Lite, Product:

1. Tensioned Advantage Electrol with Da-Mat viewing surface.
2. Tensioned Professional Electrol.
3. Boardroom Electrol.

B. Draper, Inc.

1.2 EQUIPMENT - TENSIONED ADVANTAGE ELECTROL

- A. Projection screen viewing area in 16:10 wide format, electrically operated at 115 V, 60 Hz, 2.4 amp maximum with quick connect male plug-in connector on motor. Motor shall be quick reversal type, oiled for life, mounted inside the roller, three wire with ground with automatic thermal overload cutout, internal gears, capacitor, and electric brake to prevent coasting. Provide preset but adjustable limit switches to automatically stop picture surface in the up and down positions. Junction box shall be externally integrated into the housing and contain a quick connect connector mounted in the housing for plug-in connection to the motorized fabric and roller assembly. Fabric roller shall be fabricated from rigid aluminum. Screen shall be designed for either left-hand or right-hand motor installation. Screen fabric shall be seamless, flame retardant, and mildew resistant vinyl with black masking borders, black backing, and be Greenguard Certified. Screen Gain shall be 1.0 and viewing angle shall be 60. Screen shall have black drop at the top; size as required to allow bottom of viewing area to be four feet above finished floor. Each side of the fabric shall have a tab guide cable system to maintain even lateral tension and hold surface flat. Provide slat bar with added weight to maintain vertical tension on screen surface. Ends of slat bar shall be protected by heavy duty plastic caps enclosing a preset adjustable mechanism for screen tensioning. Top, front, and back of ceiling recessed case shall be fabricated from extruded aluminum and powder coated white. Case end caps shall be fabricated from heavy gauge steel and powder coated white. Bottom of case shall have a removable access door. Door shall be fabricated from extruded aluminum and powder coated white. Bottom of case shall be self-trimming with a built-in flange around the bottom of the case. Provide a three-position control switch and cover plate. Screen shall be UL listed. Provide low voltage control system.

1.3 EQUIPMENT - TENSIONED PROFESSIONAL ELECTROL

- A. Concealed mounting type projection screen electrically operated 120 volt (60 Hz.), 2.4 amp maximum, shall have specially designed motor mounted inside the roller with noise silencer. Motor shall be three wire quick reversal type, oiled for life, with automatic thermal overload cutout, integral gears, capacitor and an electric brake to prevent coasting. Screen shall have preset but adjustable limit switches to automatically stop picture surface in the "up" and "down" positions. Roller shall be 4-1/2 inches in diameter and be mounted in one heavy duty bracket equipped with self-aligning bearing. Motor shall be secured to case with steel motor mount bracket. Screen fabric shall be flame retardant and mildew resistant fiberglass with matte white surface and black masking borders standard. Each side of fabric shall have a

tab guide cable system to maintain even lateral tension and hold screen surface flat. Bottom of fabric shall be inserted into an aluminum slat bar with added weight to provide vertical tension on screen surface. The ends of the slat shall be protected by heavy duty plastic caps enclosing a preset adjustable mechanism for screen tensioning. Case shall be wood with double top for extra rigidity and strength. Case shall be finished with black primer coat. Provide heavy metal brackets for ceiling or wall mounting. Screen shall be complete with three position control switch in box with cover plate. Screen shall be listed by Underwriters' Laboratories and CSA.

1.4 EQUIPMENT - BOARDROOM ELECTROL

- A. Concealed mounting type projection screen electrically operated 120 volt (60 Hz.), 1.0 amp, shall have specially designed motor mounted inside the roller with noise silencer. Motor shall be three wire quick reversal type, oiled for life, with automatic thermal overload cutout, integral gears, capacitor and an electric brake to prevent coasting. Screen shall have preset but adjustable limit switches to automatically stop picture surface in the "up" and "down" positions. The roller shall be of rigid metal, 3 inches in diameter, mounted on two vibration and noise absorbing supports. Screen fabric shall be flame retardant and mildew resistant fiberglass with matte white surface and black masking borders standard. Bottom of fabric shall be formed into a pocket holding a 3/8 inch diameter metal rod. Case shall be 22 gauge embossed steel with baked enamel paint finish, hexagonal in shape, with flat back to prevent scraping fabric. Provide case end caps to allow no exposed roller pins. Powder coated caps shall form sturdy brackets for ceiling installation. Screen shall be complete with three position control switch in box with cover plate. Screen shall be listed by Underwriters' Laboratories and CSA.

END OF SECTION

SECTION 12 24 13
ROLLER WINDOW SHADES

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. MechoSystems, Inc., Long Island City, NY; phone: 925.605.9068, URL: <http://www.mechosystems.com>.
2. Lutron Shading Solutions by Vimco, a division of Lutron Electronics Co., Inc., Coopersburg, PA; phone: 800.523.9466, URL: <http://www.lutron.com>.
3. Nysan Shading Systems, Calgary, AB Canada, phone: 403.204.8675, URL: <http://www.nysan.com>.
4. Draper, Inc., Spiceland, IN; phone: 800-238-7999, URL: <http://www.draperinc.com>.

1.2 MANUALLY OPERATED WINDOW SHADES

A. Manufacturers and Products:

1. MechoSystems, Inc. Product: Mecho/5.
2. Lutron Electronics Co., Inc. Product: Manual Shade Systems.
3. Nysan Shading Systems. Product: Manual Chain Operated Shades.
4. Draper, Inc. Product: Manual FlexShade Systems.

B. Roller Tube:

1. Extruded aluminum alloy roller tube.
2. Diameter: Sufficient diameter and thickness to prevent excessive deflection.

C. Manual Operated Chain Drive Hardware and Brackets:

1. Provide brackets for mounting conditions indicated on Drawings.
2. Provide for universal, regular and offset drive capability which enables the drive chain to always fall in front of the fabric plane.
3. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
4. Provide shade hardware system that allows for removable regular and/or reverse roll fascias to be mounted continuously across two or more shade bands without requiring exposed fasteners of any kind.
5. Provide shade hardware system that allows for operation of multiple shade bands (multi-banded shades) by a single chain operator, subject to manufacturer's design criteria. Connectors shall be offset to assure alignment from the first to the last shade band.
6. Provide shade hardware system that allows multi-banded, manually-operated shades to be capable of smooth operation when the axis is offset a maximum of 6 degrees on each side of the plane perpendicular to the radial line of the curve, for a 12 degrees total offset.

7. Provide positive mechanical engagement of the drive mechanism to the shade roller tube. Friction-fit connectors for the drive mechanism connection to the shade roller tube are not acceptable.
8. Provide shade hardware constructed of minimum 16 gauge, 0.060 inch thick plated steel or heavier as required to support 150 percent of the full weight of each shade.

D. Drive Bracket / Brake Assembly:

1. Drive bracket shall be fully integrated with all roller shade accessories, including, but not limited to: fascia, room darkening side / sill channels, center supports, and connectors for multi-banded shades.
2. Drive sprocket and brake assembly shall rotate and be supported on a welded 5/16-inch steel pin.
3. The brake shall be an over-running wrapped spring clutch design which disengages during the raising and lowering of a shade. The brake shall withstand a minimum pull force of 50 pounds in the stopped position.
4. The braking mechanism shall employ an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes a wrapped spring clutch assembly that ensures a smooth, non-jerky operation in raising and lowering the shades. The assembly shall be permanently lubricated requiring no maintenance. Products that require externally applied lubrication and/or are not permanently lubricated are not acceptable.
5. The entire assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.

- E. Chain: No. 10 stainless steel chain rated to 100 pound minimum breaking strength with connector and upper and lower ball stops. Provide wall mounted pulley wheel at bottom of chain to keep chain tracking straight and in-line during operation. Provide locking chain clips at each chain.

1.3 MOTOR OPERATED WINDOW SHADES

A. Manufacturers and Products:

1. MechoSystems, Inc. Product: Electro/2.
2. Nysan Shading Systems. Product: Motorized Roller Shades.
3. Draper, Inc. Product: Motorized FlexShade Systems.

- B. Motor operated tubular roller shades: Provide brackets for mounting conditions indicated on Drawings.

C. Roller Tube:

1. Extruded aluminum alloy roller tube.
2. Diameter: Sufficient diameter and thickness to support shade fabric without excessive deflection. Minimum 2.50 inch diameter for widths up to 120 inches.

D. Motorized Shade Hardware and Shade Brackets:

1. Provide brackets for mounting conditions indicated on Drawings.

2. Provide shade hardware constructed of minimum 12 gauge, 0.105 inch thick plated steel, or heavier, as required to support 200 percent of the motor stall torque Plastic components without use of steel angle construction do not meet the intent of this Section and shall not be accepted.
3. Provide shade hardware system that allows for field adjustment of EDU or replacement of any operable hardware component without requiring removal of brackets, regardless of mounting position (inside or outside mount).
4. Provide shade hardware system that allows for operation of multiple shade bands offset by a maximum of 16 degrees to 45 degrees from the EDU axis between shade bands (8 degrees to 22.5 degrees) on each side of the radial line, by a single shade EDU (multi-banded shade, subject to manufacturer's design criteria).
5. All bands within a single EDU group shall be aligned within 1/4 inch.

E. Motors:

1. UL listed asynchronous capacitor start and run with built-in thermal overload protection and limit switch adjustments.
2. Addressable 'intelligent' motors capable of up to eight group (zone) assignments without the need for additional outboard shade controllers.
3. Quiet operation: Less than 46db in 3 feet of open air, across all lift capacities necessary for project.
4. 110/120 Volts, 60 Hz, single phase.
 - a. Switches shall operate at 24 Volts.
5. Motors shall be totally enclosed within the roller tube.
6. Motors must include built-in dry-contact interface capabilities.
7. Total hanging weight of shade fabric shall not exceed 80 percent of motor's lifting capacity.

1.4 MOTOR CONTROLS

- A. Group Control System: Microprocessor controlled, programmable for unlimited intermediate stop positions and navigable sub grouping capabilities without need for rewiring. This system must be network capable and able to operate from local switching alone.

1.5 WALL SWITCHES

- A. Wired Wall Switches: Shades shall be operated by 2, 4, 5, 7, or 10-button low voltage standard switches. Standard switch shall be wired to a network interface and be programmed to transmit an address for the local switch. An address that is transmitted by either a switch or central controller shall be responded to by those EDU's with the same address in their control table. Standard switch may control an individual, sub-group or group of EDU's in accordance with the address in each EDU.
- B. Wireless Wall Switches: Shades shall be operated by 2-button wireless standard switches in conjunction with MWC will be programmed to wireless transmit via 902MHz RF an address for the local switch. An address that is transmitted by either a switch or central controller shall be responded to by those EDU's with the same address in their control table. Standard switch may control an individual, sub-group or group of EDU's in accordance with the address in each EDU.

1.6 SHADE FABRIC

A. Manufacturers and Products:

1. MechoShade, Products:
 - a. EcoVeil 1550 Series, 100 percent thermoplastic olefin, basketweave pattern with 3 percent openness factor.
2. Lutron Electronics Co., Inc., Product: Phifer SheerWeave Infinity 2 3%.
3. Nysan, Product: Phifer SheerWeave Infinity 2 3%.
4. Draper Inc., Product: Phifer SheerWeave Infinty2 3%.

B. Visually transparent non-raveling shade fabric.

C. Shade fabric shall be PVC-free. All fabrics shall be TPO based; 'PVC-free' alone will not qualify for consideration.

D. Characteristics:

1. Meet or exceed requirements of NFPA 701 and Title 19 CCR Division 1, Chapter 8.
2. Thickness: 19 mils minimum.
3. Weight: 8 ounces per square yard minimum.
4. Openness Factor: 3 percent.
5. Washable, colorfast and fade resistant.
6. Color: As selected by Architect.

1.7 BLACKOUT FABRIC

A. Manufacturers and Products:

1. MechoShade, Product: Equinox 0100 Series.
2. Lutron Electronics Co., Inc., Product: Blackout Standard #2 or Blackout Premier.
3. Nysan, Product: SuperSol.
4. Draper Inc., Product: SW7000.

B. First quality materials with no pinholes, breaks, or cracks.

C. Blackout fabric shall be PVC-free.

D. Characteristics:

1. Meet or exceed requirements of NFPA 701 and 703 and Title 19 CCR Division 1, Chapter 8.
2. Thickness: 16 mils minimum.
3. Weight: 11 ounces per square yard minimum.
4. Openness Factor: 0 percent (total blackout). Will not admit light.
5. Washable, colorfast and fade resistant.
6. Fungal and Bacterial Resistance. No growth result as per ASTM G21.
7. Color: As selected by Architect.

1.8 SHADE BANDS

- A. Shade Bands: Construction of shade band includes the fabric, the enclosed hem weight, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets shall not be acceptable.
1. Concealed Hembar: Shall be continuous extruded aluminum for entire width of shade band and with the following characteristics:
 - a. Hembar shall be heat sealed on all sides.
 - b. Open ends shall not be accepted.
 2. Shade Band and Shade Roller Attachment:
 - a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection.
 - b. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable / replaceable with a "snap-on" snap-off" Spline mounting, without having to remove shade roller from shade brackets or insert shadeband from the side.
 - c. Mounting Spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets, does not meet the performance requirements of this Section and will not be accepted.

1.9 ACCESSORIES

- A. Roller shade pocket for recessed mounting in acoustical panel ceilings, or drywall ceilings as indicated on the Drawings.
1. Provide extruded aluminum or formed steel shade pocket, sized to accommodate roller shades, with exposed extruded aluminum closure mount, acoustical panel support, and removable closure panel to provide access to shades.
 - a. Where required, provide vented pocket with a minimum of four 1 inch diameter holes per foot allowing the solar gain to flow above the ceiling line.
- B. Fascia:
1. Continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
 2. Fascia shall be able to be installed across two or more shade bands in one piece.
 3. Fascia shall fully conceal brackets, shade roller, and fabric on the tube.
 4. Provide bracket / fascia end caps where mounting conditions expose outside of roller shade brackets.
 5. Fascia shall include a channel for application of flexible material (shlegel) to closing off any light leakage between the fascia and a window frame, mullion, ceiling and/or any other horizontal surface.
 6. Fascia shall attach directly to the roller shade bracket without the need to install additional mounting hardware. Exposed fasteners shall not be allowed.
 7. Fascia shall positively lock in a top-down installation method to help prevent
 8. Notching of fascia for manual chain will not be acceptable.

C. Room Darkening Side and / or Sill Channels:

1. Extruded aluminum with polybond edge seals and snap lock mounting brackets with concealed fastening. Exposed fastening is not acceptable. Channels shall accept one-piece exposed blackout hembar with vinyl seal to assure side light control and sill light control.
2. Manual shade side channels, 1-15/16 inches wide by 1-3/16 inches deep, two-band center channels, 2-5/8 inches wide by 1-3/16 inches deep. The 2-5/8-inch double-center channels may be installed at center-support positions of multi-band-shade for motorized shades. Manual shade side channels 2-5/8 inch may be used as center supports for motorized shade and shade bands up to eight feet high. For shade bands over eight feet high, provide motorized shade side channels.
 - a. Motorized shade side channels, 2-1/2 inches wide by 1-3/16 inches deep; two-band center channels 5 inches wide by 1-3/16 inches deep. The 2-5/8-inch double-center channels may be installed at center-support positions of multi-band-shade motorized shades.
3. Color: Selected by Architect from manufacturer's standard colors.

1.10 FINISH

- A. Extruded Aluminum (panels, fascias, covers, bars, and channels):
 1. Standard baked enamel paint finish. Colors selected by Architect from manufacturer's standard colors.
- B. Shade Fabric: Type and color as selected by the Architect from samples submitted.
- C. Blackout Fabric: Type and color as selected by the Architect from samples submitted.

1.11 FABRICATION

- A. Take accurate field measurements to verify required dimensions prior to fabrication.
- B. Fabricate fabric to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or revealing.
- C. Fabricate unguided fabric to roll true and straight without shifting sideways more than 1/8 inch in either direction for every eight feet of shade height due to warp distortion or weave design.
- D. Fabricate with bottom hem weights as needed or exposed hem bar with light seal as applicable.
- E. Railroading of solar fabrics will not be allowed, except by permission of the Architect during submittal phase.
- F. Provide battens in standard shades as required to assure proper tracking and uniform rolling of fabric.

END OF SECTION

SECTION 14 21 23

ELECTRIC TRACTION PASSENGER ELEVATORS

PART 1 PRODUCTS

1.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. Basis-of-Design: KONE, Moline, IL; phone: 800.956.5663, URL: www.kone.com. Product: EcoSpace™ gearless traction elevator with Spring Stainless Steel Series cab finishes.
2. Otis Elevator Company, San Francisco, CA; phone: 415.546.0880, URL: www.otis.com. Product: Gen2 traction passenger elevator.
3. Schindler Elevator Corp., Morristown, NJ; phone: 973.397.6500, URL: www.schindler.com. Product: 400AE.

B. Substitutions:

1. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design", including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other manufacturers, whether listed or not. Submit a substitution request for any product, by any manufacturer, listed or not listed, other than the product(s) listed as "basis-of-design".
2. All costs associated with accepted substitutions shall be borne by Contractor including, but not limited to required changes to the Project's design, architectural and/or engineering design fees, detailing, Agency approvals and fees, and all additional construction costs caused by substitution.
3. Use of accepted substitutions shall in no way relieve Contractor from responsibility for compliance with Drawings and Specifications.

1.2 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microcomputer based control system to perform all of the functions.

1. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.
2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
3. Provide a serial cardrack and main CPU board containing a non-erasable EPROM and operating system firmware.
4. Variable field parameters and adjustments shall be contained in a non-volatile memory module.

B. Drive: Provide Variable Voltage Variable Frequency AC drive system to develop high starting torque with low starting current.

- C. Control Space: Locate controller in a room adjacent to the hoistway at the top landing on the machine side of the elevator.

1.3 EQUIPMENT: HOISTWAY COMPONENTS

- A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway.
- B. Governor: Friction type over-speed governor rated for the duty of the elevator specified.
- C. Buffers, Car and Counterweight: Polyurethane buffer.
- D. Hoistway Operating Devices:
 - 1. Emergency stop switch in the pit
 - 2. Terminal stopping switches.
 - 3. Emergency stop switch on the machine
- E. Positioning System: System consisting of magnets and proximity switches.
- F. Guide Rails and Attachments: Steel rails with brackets and fasteners.
- G. Provide power GFI outlet, light switch, and light at top of elevator shaft.

1.4 EQUIPMENT: HOISTWAY ENTRANCES

- A. Sills: Extruded aluminum.
- B. Doors: Hollow metal construction with vertical internal channel reinforcements.
- C. Entrance Material and Finish: 14 gauge stainless steel with brushed finish.
- D. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hours.
- E. Entrance Markings Jamb Plates: Entrance jambs shall be marked with 4 inch x 4 inch plates having raised floor markings with contracted Grade 2 Braille adjacent. Markings shall be provided on both sides of the entrance. Plate Mounting: Refer to manufacturer drawings.
- F. Sight Guards: Black sight guards will be furnished with any metal finish door. Powder paint matching sight guards will be furnished with powder paint doors.

1.5 EQUIPMENT: CAR COMPONENTS

- A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.
- B. Platform: Platform shall be all steel construction.
- C. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

D. Steel Cab:

1. Cab Wall Finish:
 - a. Back Wall Central Panel: Mirror stainless steel.
 - b. Back Side Panels: Satin stainless steel.
 - c. Side Wall Panels: Satin stainless steel.
2. Car Front Finish: Brushed stainless steel.
3. Car Door Finish: Brushed stainless steel.
4. LF-98 Ceiling: Suspended ceiling shall consist of satin stainless steel panels with six recessed rectangular LED light fixtures.
5. Handrail: 2 inch diameter satin stainless steel round tube. Rails shall be located on both side walls of car enclosure.
6. Flooring (by others): As specified in Section 09 65 00.
7. Threshold: Extruded aluminum.
8. Protective pad hooks and quilted fire retardant protective pads: Pad shall be hung from suspended ceiling.

E. Emergency Car Signals:

1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
2. Emergency Car Lighting: Provide emergency power unit employing a 12-volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

F. Ventilation: An exhaust fan shall be mounted on the car top.

G. Utility Outlet: A 125V, 15 ampere utility outlet with ground-fault circuit-interrupter protection shall be furnished on top of the cab.

1.6 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation.

1. Car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons shall have amber illumination (halo) and shall be car operating panel button type. Raised markings and contracted Grade 2 Braille markings shall be provided for each push-button. The car operating display panel shall be a seven-segment amber display. All texts, when illuminated, shall be amber. The car operating panel shall have a brushed stainless steel finish.
2. Additional features of car operating panel shall include:
 - a. Car Position Indicator within operating panel (amber).
 - b. Elevator Data Plate marked with elevator capacity and car number on car top.

- c. Help button markings with raised markings.
 - d. In car stop switch per local code.
 - e. Firefighter's hat.
 - f. Firefighter's Phase II Key-switch.
 - g. Firefighter's Phase II emergency in-car operating instructions.
 - h. Call Cancel Button.
 - i. Pre-programmed integrated ADA phone.
 - j. Help Button/Communicator. Activation of help button will initiate two-way communication between car and a location inside the building, switching over to alternate location if call is unanswered, where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
- B. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a brushed stainless steel finish.
- 1. Hall fixtures shall feature round, mechanical, illuminated buttons in raised fixture housings. Hall fixtures shall correspond to options available from that landing. Buttons shall be flat flush in vertically mounted fixture. Hall fixtures should not be jamb-mounted. Hall lanterns shall feature amber illumination.
- C. Hall Lanterns and Chime: A directional lantern visible from the corridor shall be provided at each hall entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound. The audible chime shall sound once for up and twice for down. Audible signals shall have a frequency of 1500 Hz maximum and shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the hall call button.
- D. Combination Hall Position Indicator and Hall Lantern located at Lobby and First Floor. Hall lanterns and hall indicators shall feature amber illumination, all numbers will be seven-segment amber display.

1.7 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

- A. Elevator Operation:
- 1. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
 - 2. Zoned Car Parking.
 - 3. Relative System Response Dispatching.
- B. Standard Operating Features to include:
- 1. Full Collective Operation
 - 2. Fan and Light Control.
 - 3. Load Weighing Bypass.
 - 4. Ascending Car Uncontrolled Movement Protection
 - 5. Top of Car Inspection Station.

C. Additional Operating Features shall include:

1. Automatic Standby Power Operation with Manual Override.
 - a. This operation shall return the car automatically to a designated landing when the system is initially switched to standby power.
 - b. Manual Override of Standby Power Operation is achieved by a manual input for the car via a rotary selector, individual key switch for each car switch. A manually selected car may be run either in a return operation to a designated landing or in normal operation under standby power. If a manually selected car has not yet returned to the designated landing, it will perform this operation first then immediately go into normal operation.

D. Elevator Control System for Inspections and Emergency:

1. Provide connection of elevator to campus emergency power generator system.
2. Provide devices within controller to run the elevator in inspection operation.
3. Provide devices on car top to run the elevator in inspection operation.
4. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.
5. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.
6. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
7. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
8. Provide the means for the control to reset elevator earthquake operation.

1.8 EQUIPMENT: DOOR OPERATOR AND CONTROL

- A. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.
- B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.
- C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.
- D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.

- E. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

1.9 PROVISIONS FOR THE PHYSICALLY DISABLED

- A. Comply with CBC Chapter 11B and ANSI A117.1.
 - 1. Passenger elevators shall comply with CBC Sections 11B-206.6 and 11B-407.
- B. Provide indicators near controls in conformance with ANSI A117.1.
- C. Controls shall be located within one of the reach ranges specified in CBC Sections 11B-308 and 11B-407.4.6.1.
- D. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators shall be provided for call initiation and call acknowledgement.
- E. Sound audible tone signal in car when car is stopping at a floor.
- F. Include audible tone signals with illuminated landing indicators: once for UP stops and twice for DOWN stops.
- G. Call controls shall comply with CBC Sections 11B-309.4 and 11B-407.2.1.
- H. Control buttons shall be identified by raised characters or symbols, white on a black background, and Braille per CBC Section 11B-407.4.7.1.1.
- I. Hall Signals shall comply with CBC Section 11B-407.2.2.
- J. Elevator landings shall comply with CBC Sections 1007 and 11B-407.2.
- K. Hoistway signs shall comply with CBC Section 11B-407.2.3.
- L. Directional signs shall comply with CBC Sections 1009.10 and 11B-703.5.
- M. At each floor landing, provide vandal-proof floor designations in both raised characters and Braille on both jambs of elevator hoistway entrances. Provide white characters on black background. Comply with CBC Sections 11B-407.2.3.1 and 11B-703.
- N. At main entry level, provide raised characters, Braille, and five pointed raised star placed to the left of the floor designation on both jambs of elevator hoistway entrance per 11B-407.2.3.1.
- O. The clearance between the car platform sill and the edge of the hoistway landing shall be no greater than 1-1/4 inches per CBC Section 11B-407.4.3.
- P. Elevator car shall be equipped with a self-leveling feature that will automatically bring and maintain the car at floor landings within a tolerance of 1/2 inch under rated loading to zero loading conditions per CBC 11B-407.4.4.

- Q. Provide minimum acceptable time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close using the formula stated in CBC Section 11B-407.3.4.
- R. Elevator doors shall comply with CBC Section 11B-407.3.
- S. Elevator doors shall remain fully open in response to a car call for five seconds minimum per CBC Section 11B-407.3.5.
- T. Buttons with floor designations shall be provided with visible indicators to show that a call has been registered. The visible indication shall extinguish when the car arrives at the designated floor per CBC Section 11B-407.4.7.1.4.
- U. Control buttons shall be illuminated, shall have square shoulders, and shall be activated by a mechanical motion that is detectable. All control buttons shall be designated by a 5/8 inch minimum raised Arabic numeral, standard alphabet character, or standard symbol immediately to the left of the control button. A Braille symbol shall be located immediately below the numeral, character or symbol. A minimum clear space of 3/8 inch or other suitable means of separation shall be provided between rows of control buttons. The raised characters shall be white on a black background per CBC Section 11B-407.4.7.1.1.
- V. Controls and emergency equipment identified by raised symbols and Braille shall include, but not be limited to, main entry floor, door open, door closed, alarm bell, emergency stop, and telephone per CBC Section 11B-407.4.7.1.3 and CBC Table 11B-407.4.7.1.3.
- W. Two-way communication system shall be provided per CBC Sections 1009.8 and 11B-308.
 - 1. Locate the center of the emergency telephone handset no more than 48 inches above floor level. Handset cord shall be 29 inches minimum in length. Instructions for emergency telephone use shall be provided in both tactile and visual form.
- X. The call button for the main entry floor shall be designated by a raised star at the left of the floor designation per CBC Section 11B-407.4.7.1.
- Y. The level of illumination at the car controls, platform, car threshold, and car landing sill when the car and landing doors are open shall be not less than five foot-candles (54 lux) per CBC Section 11B-407.4.5.
- Z. As the car passes a floor and when a car stops at a floor served by the elevator, the corresponding character shall illuminate per CBC Section 11B-407.4.8.1.3.
- AA. Elevator cars shall comply with CBC Section 11B-407.4.
 - 1. Car controls shall comply with CBC Sections 11B-309.4 and 11B-407.4.6.
 - 2. Visible and audible car position indicators shall comply with CBC Sections 11B-407.4.8.1 and 11B-407.4.8.2.

END OF SECTION

SECTION 14 24 00
HYDRAULIC ELEVATORS

PART 1 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Otis Elevator Company.
- B. ThyssenKrupp.
- C. Substitutions:
 - 1. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design", including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other manufacturers, whether listed or not. Submit a substitution request for any product, by any manufacturer, listed or not listed, other than the product(s) listed as "basis-of-design".
 - 2. All costs associated with accepted substitutions shall be borne by Contractor including, but not limited to required changes to the Project's design, architectural and/or engineering design fees, detailing, Agency approvals and fees, and all additional construction costs caused by substitution.
 - 3. Use of accepted substitutions shall in no way relieve Contractor from responsibility for compliance with Drawings and Specifications.

2.2 EQUIPMENT - MACHINE ROOM COMPONENTS

- A. The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a muffler, low-pressure switch and a shut-off valve.
- B. A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three phase overload device shall be provided to protect the motor against overloading.
- C. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- D. Include the following options as required:
 - 1. Tank Heater.
 - 2. Low-oil control.
 - 3. Pressure Switch – Required on holeless (arrgt. 1), roped (arrgt. 3), and telescopic (arrgt. 4); optional on holed (arrgt. 2).

2.3 EQUIPMENT - HOISTWAY COMPONENTS

- A. Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
1. For systems requiring the hydraulic cylinder to be installed in a well hole:
 - a. A sealed PVC cylinder protection system shall be installed. The system shall provide a means to monitor the space between the PVC sleeve and cylinder wall and evacuate unwanted fluids, so as to prevent such fluids from remaining in contact with the cylinder.
 - b. Hydraulic fluid shall be non-combustible type.
- B. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
- C. Spring Buffer: Helical coil spring type.
- D. Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.
- E. Provide the following for Roped Hydraulic Units (Arrgt. #3):
1. Safety: An instantaneous safety shall be provided which will be actuated by a friction governor and governor tension sheave. The instantaneous safety shall be automatic, and reset by running the car in the up direction.
 2. Governor: The governor shall be located in the hoistway overhead. The governor shall include an electrically activated means of manually tripping the governor from the machine room for annual no-load and five-year full-load safety tests. The design shall not require a governor access door.
 3. Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to prevent the plunger from leaving the cylinder. A sheave shall be located at the top of each plunger and shall be guided through its travel by a set of plunger rails. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
 4. Ropes: Ropes shall be fastened to the top of the cylinder jackstands, travel over the plunger sheave and attach to the bottom of the elevator carframe.

F. Hoistway Entrances;

1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of 14-gauge sheet steel. Additional sill angle support will be provided with 4 foot-0 inch and 4 foot-6 inch two speed opening door arrangements (4500 & 5000 pound cars). Sills shall be extruded aluminum.
2. Doors: Entrance doors shall be of hollow metal construction with vertical internal channel reinforcements.
3. Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour.
4. Entrance Finish:
 - a. Provide entrance finishes at each entrance. Clearly indicate landing/opening designations for each finish. For example: "Lobby - satin finish stainless steel, floors 2 through 8 - with white powder paint". Frame and Door finish may be independent.
 - b. Select from the following finishes:
 - 1) Satin stainless steel,
 - 2) Satin bronze,
 - 3) Mirror stainless steel,
 - 4) Mirror bronze,
 - 5) Powder paint finish, Color to be selected from the manufacturer's standard color chart.
5. Entrance Markings: Entrance jambs shall be marked with 4 inch x 4 inch plates having raised floor markings with contracted Grade 2 Braille adjacent. Markings shall be provided on both sides of the entrance.
6. Sight Guards: Black sight guards will be furnished with any metal finish door. Powder paint matching sight guards will be furnished with powder paint doors.

2.4 EQUIPMENT - CAR COMPONENTS

A. Select from the following cab types:

1. Car Frame: A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.
2. Platform, Heavy Loading Type: The car platform shall be arranged to accommodate one-piece loads weighing up to 25 percent of the rated capacity, such as wheeled food carts, stretchers, x-ray equipment, etc. The platform shall be recessed 5/16 inch for flooring by others.
3. Vertical Light-Weight Series 1 Cab walls to have attached vertical non-removable panels, laminated front and back with plastic laminate.

B. Options:

1. Satin stainless steel wainscot to be provided at the lower portion of the panels.

2. Removable Panels (Series 2) Cab walls to be made of 16-gauge sheet steel painted with black powder paint and are to have perforations for hardware to mount removable panels. Laminate to be chosen from the manufacturer's standard selection. Panel types:
 - a. .Vertical: Vertical panel in plastic laminate edged in black PVC.
 - b. Horizontal: Horizontal panels in plastic laminate edged in black PVC.
 - c. Vertical w/Frieze: Vertical panel in plastic laminate edged in black PVC with 9 inch frieze. Finish of frieze: mirror stainless steel or mirror bronze.
 - d. Horizontal w/Stainless Wainscoting: Horizontal panels with top panel in plastic laminate and bottom panel in satin stainless steel, edged in black PVC.
 - e. Vendor Removable Panels: Vendor removable panels; manufacture to provide hardware for vendor panels (clips).
 3. Steel Cab (Series 3) Cab walls to be of 14-gauge sheet steel: Select from the following finishes:
 - a. Powder paint finish. Color to be selected from the manufacturer's standard color chart.
 - b. Satin stainless steel.
 - c. Patterned stainless steel .
- G. Car Front Finish: Car front(s) and door finish can be independent. Select from the following finishes:
1. Satin stainless steel
 2. Satin bronze
 3. Mirror stainless steel
 4. Mirror bronze
 5. Powder paint finish, Color to be selected from the manufacturer's standard color chart.
- H. Car Door Finish: Car front(s) and door finish can be independent. Select from the following finishes, unless otherwise directed by Architect:
1. Satin stainless steel,
 2. Satin bronze,
 3. Mirror stainless steel,
 4. Mirror bronze,
 5. Powder paint finish, Color to be selected from the manufacturer's standard color chart.
- I. Car top to be of wood material clad on both sides with a natural finish aluminum panel.
- J. Ceiling Type. Select from the following:
1. Downlight suspended ceiling will have panels set with incandescent down lights, one per panel (120 volts), laminated with one of the following:
 - a. Natural mirror finish,
 - b. Natural satin finish,
 - c. Bronze satin finish,
 - d. Bronze mirror finish,

- e. Plastic laminate, Color to be selected from the manufacturer's standard color chart.
 2. Lexan suspended ceiling shall consist of white translucent polycarbonate diffusers set in frame of extruded aluminum or aluminum with gold-tone-paint with fluorescent lighting fixtures.
 3. Aluminum Eggcrate suspended ceiling shall consist of aluminum eggcrate diffusers set in frame of extruded aluminum or aluminum with gold-tone-paint with fluorescent lighting fixtures.
 4. Low-Voltage Downlight suspended ceiling will have panels set with incandescent down lights, four per panel (12 volts), laminated with one of the following:
 - a. Natural mirror finish,
 - b. Natural satin finish,
 - c. Bronze satin finish,
 - d. Bronze mirror finish,
 - e. Plastic laminate, Color to be selected from the manufacturer's standard color chart.
 5. Disk suspended which shall consist white translucent polycarbonate with circular diffusers set in frame of extruded aluminum or aluminum with gold-tone-paint with fluorescent lighting fixtures.
 6. Perimeter Lighted suspended ceiling (available with Series 2 and 3 cabs only) which will have panels set with perimeter fluorescent lighting, and laminated with one of the following:
 - a. Natural mirror finish,
 - b. Natural satin finish,
 - c. Bronze satin finish,
 - d. Bronze mirror finish,
 - e. Plastic laminate, Color to be selected from the manufacturer's standard color chart.
- C. Emergency Car Lighting: An emergency power unit employing a six volt, sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car and provide current to the emergency siren in the event of building power failure.
- D. Emergency Pulsating Siren: Siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged. Siren shall have a rated sound pressure level of 80 dba at a distance of three meters from the device. Siren shall respond with a delay of not more than 1 second after the switch or push button has been pressed
- E. Exhaust Fan: An exhaust fan shall be mounted on the car top.
- F. Utility Outlet: A 125V, 15 amperes utility outlet with ground-fault circuit-interrupter protection shall be furnished on top of the cab.
- G. Handrail:
1. Select from the following handrail types:
 - a. Rectangular Tubular Metal Bar,
 - b. Flat solid metal,
 - c. Round tubular metal,

- d. Red Oak.
- H. Bumper Rail:
 - 1. Flat Solid Metal.
- I. Threshold: Aluminum or bronze.
- J. Protective pad hooks and quilted fire retardant protective pads: Pad Buttons will be provided with non-suspended ceiling.
- K. An electrical contact shall be provided on the car-top exit.

2.5 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car-Operating Panel: A panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. Raised markings and contracted Grade 2 Braille markings shall be provided for each push-button. Car fixture selections can be selected independently of hall fixture selections.
 - 1. Car Fixture Finish: Select from the following finishes:
 - a. Satin stainless steel,
 - b. Satin bronze,
 - c. Mirror stainless steel,
 - d. Mirror bronze,
 - e. Powder paint car fronts will have satin stainless steel fixture finish with Series 1 car fixtures.
 - 2. Panel types:
 - a. For Series 1 Fixtures Applied car operating panel shall be furnished. It shall contain a bank of square mechanical illuminated buttons marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have both raised and contracted Grade 2 Braille markings. LED (red) button illumination with 1/8 inch projecting target.
 - b. For Series 4 Fixtures Hinged swing car operating panel shall be furnished. It shall contain a bank of round mechanical illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have raised numerals and contracted Grade 2 Braille markings. LED green or red halo illumination with Flat Flush or 1/8 inch projecting targets. Target finishes: Satin stainless steel, satin bronze, mirror stainless steel, or mirror bronze.
 - c. For Series 4 Vandal- Resistant Fixtures Hinged swing car operating panel shall be furnished. It shall contain a bank of round mechanical illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have raised numerals and

contracted Grade 2 Braille markings. LED red halo illumination with Flat Flush or 1/8 inch projecting targets. Target finish is satin stainless steel.

- B. Car Position Indicator: A 16-segment, digital, vacuum fluorescent car position indicator shall be integral to the car operating panel.
- C. Series 1, 2-Row Car Operating Panel: An ADA compliant communication device shall be provided which has been designed in response to ADAAG requirements integral with the car operating panel.
 - 1. For telephone by others, communications equipment and connections to the building service system shall be furnished and installed as work of electrical subcontractor. The telephone instrument shall be furnished by the electrical subcontractor.
- D. Series 1, 3-Row Car Operating Panel Telephone Cabinet with Certificate Frame: A telephone compartment shall be furnished in the return panel below the car-operating panel. Necessary wires for the telephone shall be included in the compartment and connected to the car traveling cable. An ADA compliant communication device shall be provided which has been designed in response to ADAAG requirements.
 - 1. For telephone by others, communications equipment and connections to the building service system shall be furnished and installed as work of electrical subcontractor. The telephone instrument shall be furnished by the electrical subcontractor.
- E. Series 4 Telephone Cabinet with Certificate Frame: A telephone compartment shall be furnished integral with the car-operating panel. Necessary wires for the telephone shall be included in the compartment and connected to the car traveling cable. An ADA compliant communication device shall be provided which has been designed in response to ADA requirements.
 - 1. For telephone by others, communications equipment and connections to the building service system shall be furnished and installed as work of electrical subcontractor. The telephone instrument shall be furnished by the electrical subcontractor.
- F. Hall Lanterns and Chime: A directional lantern visible from the corridor shall be provided at each hall entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound. The audible chime shall sound once for up and twice for down. Audible signals shall have a frequency of 1500 Hz maximum and shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the hall call button.
- G. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Raised markings shall be provided for each push-button. Hall fixture selections can be selected independently of car fixture selections.
- H. When standby power is provided, an illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power supply has failed and the emergency or standby power is in effect.
- I. Landing Passing Signal: A chime bell shall sound in the car to tell a passenger that the car is either stopping at or passing a floor served by the elevator.
- J. Options:
 - 1. Hall Position Indicator at specified landings.

2. Hall Lanterns and Chime: A directional lantern visible from the corridor shall be provided at each hall entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.
3. Combination Hall Position Indicator and Hall Lanterns at specified landings.
4. Standby Cabinet: Manual selection of each elevator in normal operation after automatic return in standby power operation has been initiated. This is achieved via a strip switch inside the standby-power cabinet.
5. Second car operating panel.
6. Security Lockout Keyswitches to disable activation of car-floor buttons.
7. Security Lockout Keyswitches to disable activation of hall buttons.
8. Keyswitch Operation in lieu of hall buttons,

2.6 PROVISIONS FOR THE PHYSICALLY DISABLED

- A. Comply with CBC Chapter 11B and ANSI A117.1.
 1. Passenger elevators shall comply with CBC Sections 11B-206.6 and 11B-407.
- B. Provide indicators near controls in conformance with ANSI A117.1.
- C. Controls shall be located within one of the reach ranges specified in CBC Sections 11B-308 and 11B-407.4.6.1.
- D. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators shall be provided for call initiation and call acknowledgement.
- E. Sound audible tone signal in car when car is stopping at a floor.
- F. Include audible tone signals with illuminated landing indicators: once for UP stops and twice for DOWN stops.
- G. Call controls shall comply with CBC Sections 11B-309.4 and 11B-407.2.1.
- H. Control buttons shall be identified by raised characters or symbols, white on a black background, and Braille per CBC Section 11B-407.4.7.1.1.
- I. Hall Signals shall comply with CBC Section 11B-407.2.2.
- J. Elevator landings shall comply with CBC Sections 1007 and 11B-407.2.
- K. Hoistway signs shall comply with CBC Section 11B-407.2.3.
- L. Directional signs shall comply with CBC Sections 1009.10 and 11B-703.5.
- M. At each floor landing, provide vandal-proof floor designations in both raised characters and Braille on both jambs of elevator hoistway entrances. Provide white characters on black background. Comply with CBC Sections 11B-407.2.3.1 and 11B-703.
- N. At main entry level, provide raised characters, Braille, and five pointed raised star placed to the left of the floor designation on both jambs of elevator hoistway entrance per 11B-407.2.3.1.

- O. The clearance between the car platform sill and the edge of the hoistway landing shall be no greater than 1-1/4 inches per CBC Section 11B-407.4.3.
- P. Elevator car shall be equipped with a self-leveling feature that will automatically bring and maintain the car at floor landings within a tolerance of 1/2 inch under rated loading to zero loading conditions per CBC 11B-407.4.4.
- Q. Provide minimum acceptable time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close using the formula stated in CBC Section 11B-407.3.4.
- R. Elevator doors shall comply with CBC Section 11B-407.3.
- S. Elevator doors shall remain fully open in response to a car call for five seconds minimum per CBC Section 11B-407.3.5.
- T. Buttons with floor designations shall be provided with visible indicators to show that a call has been registered. The visible indication shall extinguish when the car arrives at the designated floor per CBC Section 11B-407.4.7.1.4.
- U. Control buttons shall be illuminated, shall have square shoulders, and shall be activated by a mechanical motion that is detectable. All control buttons shall be designated by a 5/8 inch minimum raised Arabic numeral, standard alphabet character, or standard symbol immediately to the left of the control button. A Braille symbol shall be located immediately below the numeral, character or symbol. A minimum clear space of 3/8 inch or other suitable means of separation shall be provided between rows of control buttons. The raised characters shall be white on a black background per CBC Section 11B-407.4.7.1.1.
- V. Controls and emergency equipment identified by raised symbols and Braille shall include, but not be limited to, main entry floor, door open, door closed, alarm bell, emergency stop, and telephone per CBC Section 11B-407.4.7.1.3 and CBC Table 11B-407.4.7.1.3.
- W. Two-way communication system shall be provided per CBC Sections 1009.8 and 11B-308.
 - 1. Locate the center of the emergency telephone handset no more than 48 inches above floor level. Handset cord shall be 29 inches minimum in length. Instructions for emergency telephone use shall be provided in both tactile and visual form.
- X. The call button for the main entry floor shall be designated by a raised star at the left of the floor designation per CBC Section 11B-407.4.7.1.
- Y. The level of illumination at the car controls, platform, car threshold, and car landing sill when the car and landing doors are open shall be not less than five foot-candles (54 lux) per CBC Section 11B-407.4.5.
- Z. As the car passes a floor and when a car stops at a floor served by the elevator, the corresponding character shall illuminate per CBC Section 11B-407.4.8.1.3.
- AA. Elevator cars shall comply with CBC Section 11B-407.4.
 - 1. Car controls shall comply with CBC Sections 11B-309.4 and 11B-407.4.6.
 - 2. Visible and audible car position indicators shall comply with CBC Sections 11B-407.4.8.1 and 11B-407.4.8.2.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 PRODUCTS

1.1 MATERIALS

- A. All fill shall be approved local materials from required excavations, supplemented by imported fill, where necessary. Approved local materials are defined as local soils, free of rubble, rubbish and vegetation, tested and approved by the Geotechnical Engineer prior to use. Clods, rocks or hard lumps exceeding 6 inches in final size shall not be allowed in the upper 12 inches of any fill supporting pavements or buildings. On-site clay soils should not be used as fill materials within the upper 12 inches of building pad or pavement subgrades. Clay soils will be identified by Geotechnical Engineer in the field.
 - 1. Imported fill materials shall be approved by Geotechnical Engineer; shall meet the above requirements; shall have plasticity indices not exceeding 12 as determined by ASTM D4318, an expansion indices not greater than 20, and a 4 inch maximum particle size as determined by ASTM D422.
 - 2. Imported material, if used, shall be imported by the Contractor from his own source and at no additional cost to Owner.
- B. Topsoil material for landscaped areas shall be loose and friable soil equal to existing surface soils found on the site.
- C. Water: Furnish all required water for construction purposes, including compaction and dust control.
- D. Capillary Barrier: Clean gravel or crushed rock of 3/4 inch maximum size, with no material passing a #4 sieve.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 EXECUTION

1.1 CLEARING AND REMOVALS

- A. General site clearing shall include removal of all surface debris, rubble and larger vegetation. Items and materials shall include, but not necessarily limited to, the following:
 - 1. Roots of trees shall be removed to a point at least 1 foot below the lowest level of grade upon which fill will be placed.
 - 2. All other miscellaneous, existing site materials or site improvements not indicated to remain unless otherwise directed by the Architect.
- B. Clearing, Grubbing and Preparing Areas to be Filled:
 - 1. After debris removal is complete, organics shall be removed by stripping. The stripping operations shall extend 1 inch to 2 inches into the soil.
 - 2. Approved topsoil shall be stockpiled in areas, as directed by the Architect, where it will not interfere with the mass grading and is to be used later in areas which receive landscape planting.
 - 3. All organic garden soil and any other soil deemed soft or unsuitable by the Architect shall be removed.
 - 4. The final stripping and excavation shall be approved by the Architect before further grading, specified in Section 31 00 00, is started.
- C. Within the development area, excavation resulting from the removal of the above items and materials and extending below final grades shall be cleaned to firm, undisturbed soil as determined by the Architect. All such depressions shall be backfilled with compacted fill as specified in Section 31 00 00.

1.2 CLEAN-UP AND DISPOSAL

- A. General: All items and materials indicated or specified to be demolished and removed shall become the Contractor's property and shall be removed from the premises. The Contractor shall make all arrangements for the disposal of materials and pay all costs involved. Waste material and unsuitable material may be stockpiled and shall be removed from the site weekly.
- B. Burning will not be permitted.
- C. The Contractor shall maintain cleanliness on roadways or other public areas used by equipment and will be held responsible for immediate removal of all spillage on paving. The Contractor shall remove from the Project site all materials and debris resulting from clearing and removals, leaving the area of work in a safe and clean condition.

1.3 FIELD QUALITY CONTROL

- A. The Architect and Owner's representative will accompany the Contractor before and after performance of work to confirm the physical condition of improvements involved.

END OF SECTION

SECTION 31 23 33

TRENCHING AND BACKFILLING

PART 1 PRODUCTS

1.1 MATERIALS

- A. Pipe bedding and initial backfill shall be sand conforming to ASTM C33, clean and free of clay, silt or organic matter.
 - 1. Pipe bedding and backfill material used in trenches containing utilities owned by utility companies shall meet all requirements of that utility company.
- B. Trench Backfill material for backfilling trenches above the pipe bedding and initial backfill material shall be well-graded pea gravel material, less than 3/8 inch in greatest dimension, clean and free of clay, silt or organic matter, conforming to ASTM C33 and judged suitable by Geotechnical Engineer.
- C. Trench "capping" material for use above trench backfill material shall be fill material judged suitable by Geotechnical Engineer. Suitable material for "trench capping" shall be the same as the material described in Section 31 00 00.

PART 2 EXECUTION

2.1 TRENCHING

- A. Make all trenches open vertical or sloped construction, as recommended by the manufacturer of the pipe, and with sufficient width to provide free working space at both sides of trench and around installed item as required for caulking, joining, backfilling and compacting. Where no manufacturer's recommendations are available, trenches shall be not less than 12 inches nor more than 24 inches wider than pipe or conduit diameter.
 - 1. Where recommended trench widths are exceeded redesign shall be performed at no extra cost to the Owner, using stronger pipe or special installation procedures.
 - 2. Restore all surfaces damaged or cut during excavation to original condition.
- B. Excavate trench straight and true to line and grade and to a depth below the bottom of the pipe sufficient to provide for pipe bedding material as required. Trenches over-excavated in depth shall be refilled with suitable materials and compacted to 90 percent relative compaction.
- C. Excavations for utilities related structures and appurtenances, manholes, drop inlets or similar structures shall be sufficient to leave at least 12 inches clear between the outer structure surface and face of the excavations. When concrete is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation.
- D. Excavate an additional 6 inches and provide 6 inch bed of sand to proper grade.
- E. Unsatisfactory material, as determined by the Geotechnical Engineer, shall be removed and replaced with suitable material compacted to 90 percent relative compaction.

- F. Where depths are not shown, trench to sufficient depth to give minimum fill above top of installed item measured from adjacent finished grade as follows:
 - 1. Electrical conduit: 24 inches or deeper where required by Division 26.
 - 2. Plumbing pipe: 36 inches or deeper where required by Division 22.

2.2 CONTROL OF GROUND WATER

- A. The Contractor shall provide all labor, equipment and materials for dewatering trenches and excavations and subsequent control of ground water.

2.3 BRACING AND SHORING

- A. The Contractor shall furnish, place and maintain such bracing and shoring as necessary for the safety of workers, protection of adjacent facilities and utilities, and proper installation of pipe, in conformance with legal requirements.

2.4 PIPE BEDDING PLACEMENT

- A. A 6 inch layer of pipe bedding material compacted to 90 percent relative compaction (per ASTM D1557) shall be placed and accurately shaped as required for the indicated pipe elevations and grades.

2.5 BACKFILLING

- A. Initial Backfill Placement: Initial backfill material shall be placed and compacted to 90 percent relative compaction (per ASTM D1557) on both sides of the pipe simultaneously to avoid displacement of the pipe, 6 inches above pipe.
- B. Trench Backfill Placement: Subsequent trench backfill material shall be placed in layers not exceeding 6 inches thick and compacted to 90 percent relative compaction (per ASTM D1557) up to 6 inches from finish surface or subgrade.
- C. Trench "Capping" Material: The trench shall be "capped" above the trench backfill with trench "capping" material compacted to 95 percent relative compaction (per ASTM D1557) to subgrade or finish surface.
 - 1. Refer also to Section 31 00 00.
- D. Backfill for utility related or similar structures shall be placed as specified above and in such a manner that the structure will not be damaged.
- E. Remove excess earth from site and properly dispose of same.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 PRODUCTS

1.1 MATERIALS

- A. Soil sterilizer shall be CIBA GEIGY's Pramitol 25-E or Thompson-Hayward Casoron.
 - 1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.
- B. Aggregate Base: Class 2 aggregate base conforming to Caltrans Standard Specifications Section 26 or recycled asphalt concrete paving (verify with Soil Engineer/Soil Report).
- C. Asphalt Binders: Steam-refined paving asphalt conforming to Caltrans Standard Specifications Section 92, viscosity grade AR 4000.
- D. Paint Binders: Conform to requirements of Caltrans Standard Specifications Section 94.
- E. Asphalt Concrete: conform to requirements of Caltrans Standard Specifications Section 39 for Type A asphalt with 1/2 inch maximum medium aggregate size using AR 4000 asphalt for binder.
- F. Seal Coat: A premixed asphalt emulsion blended with select fillers and fibers.
 - 1. Acceptable Manufacturers and Products:
 - a. "Park-Top No. 302," Western Colloid Products.
 - b. "OverKote," RaynGuard.
 - c. "Drivewalk," Conoco Oil.
- G. Pavement Marking Paint:
 - 1. Acceptable Manufacturers and Products:
 - a. Sherwin-Williams. Product: Set Fast Vinyl Acrylic TM-226/227.
 - b. Glidden Professional. Product: Latex Traffic Paint.
 - c. Dunn-Edwards Corp. Product: Traffic Paint W-801.
 - 2. Colors:
 - a. Striping and Lettering: White.
 - b. Limited Parking: Green.
 - c. Disabled Access: Blue. Blue paint shall match Color No. 15090 of Federal Standard 595A.
 - d. Caution and Bus Loading: Yellow.
 - e. Fire Lane: Red.
 - f. Black Out Striping: Black.
- H. Headerboards: 2x Foundation Grade Redwood.
 - 1. Use 1/2 inch thick boards where required for bending.

- I. Wheelstops: Precast concrete 2,500 psi at 28 days, smooth finish concrete parking bumper as manufactured by Valley Precast or approved equal. Length 48 inches unless otherwise indicated.

1.2 PAVING STRUCTURAL SECTION

A. Asphalt Concrete Paving – Pedestrian walk:

1. Asphalt Concrete: 2 inches Type A using 1/2 inch maximum medium grading aggregates.
2. Paint Binder: As specified herein.
3. Soil Sterilizer: As specified herein.
4. Aggregate Base: 4 inches Class 2 aggregate base.
5. Subgrade: As specified and included in Section 31 00 00.

B. Asphalt Concrete Paving – Driveway areas:

1. Same as "A" above except:
2. 3 inches Type A asphalt concrete.
3. 12 inches Class 2 aggregate base.

1.3 MIXING

- A. Mix surface course aggregate and asphalt binder in central mixing plant in accordance with Caltrans Standard Specifications Section 39 by either batch mixing or continuous mixing to produce uniform distribution of binder.
- B. Plant shall be equipped with accurately calibrated devices 320 degrees F for control of temperature and weight of both ingredients.
- C. Ensure temperature of asphalt concrete does not exceed 320 degrees F at anytime and is not less than 250 degrees F at time of delivery.

END OF SECTION

SECTION 32 13 13
CONCRETE PAVING

PART 1 PRODUCTS

1.1 MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
- B. Coat forms with a nonstaining form release agent that will not discolor or deface surface of concrete.
- C. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A185.
 - 1. Furnish in flat sheets, rolls not permitted.
- D. Reinforcing Bars: Deformed steel bars, ASTM A615, Grade 60.
- E. Joint Dowel Bars: Plain steel bars, ASTM A615, Grade 60. Cut bars true to length with ends square and free of burrs.
- F. Metal Expansion Caps: Furnish for one end of each dowel bar in expansion joints. Design caps with one end closed and a minimum length of 3 inches to allow bars movement of not less than 1 inch, unless otherwise indicated.
- G. Hook Bolts: ASTM A307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- H. Concrete Materials: Comply with requirements of Section 03 30 00 for concrete materials, admixtures, bonding materials, curing materials, and others as required.
- I. Expansion Joint Materials: Comply with requirements of Section 03 30 00 and Section 07 92 00 for preformed expansion joint fillers and sealers.
- J. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C309, Type I, Class A. Moisture loss no more than 0.055 grams per square centimeter when applied at 200 square feet per gallon.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "Eucocrete," Euclid Chemical Co.
 - b. "Spartan-Cote," The Burke Co.
 - c. "Kure-N-Seal," Sonneborn-Contech.
 - d. "Dress & Seal," L & M Construction Chemicals.
- K. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. "J-40 Bonding Agent," Dayton Superior Corp.
 - b. "Weldcrete," Larsen Products.

- c. "Intralok," W.R. Meadows.
 - d. "Everbond," L & M Construction Chemicals.
 - e. "EucoWeld," Euclid Chemical Co.
 - f. "Hornweld"; A. C. Horn.
 - g. "Sonocrete," Sonneborn-Contech.
 - h. "Acrylic Bondcrete," The Burke Co.
- L. Epoxy Adhesive: ASTM C881, two-component material suitable for use on dry or damp surfaces. Provide material "Type," "Grade" and "Class" to suit project requirements.
1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include but are not limited to the following:
 - a. "Epoxite," A. C. Horn.
 - b. "Edoco 2118 Epoxy Adhesive," Edoco Technical Prod.
 - c. "Sikadur Hi-Mod," Sika Chemical Corp.
 - d. "Euco Epoxy 452 or 620," Euclid Chemical Co.
 - e. "Patch and Bond Epoxy," The Burke Co.
 - f. "Sure-Poxy," Kaufman Products Inc.

1.2 CONCRETE MIX, DESIGN, AND TESTING

- A. Comply with requirements of applicable Division 03 Sections for concrete mix design, sampling and testing, and quality control and the requirements of Class A concrete per Section 73 of CalTrans Standards and as specified herein.
- B. Design mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water-reducing admixture (super-plasticizer), air-entraining admixture, and water to produce the following properties:
 1. Compressive Strength:
 - a. At 6 inch thick Traffic Slabs: 3,500 psi minimum at 28 days, unless otherwise indicated.
 - b. At 4 inch thick Sidewalks: 2,500 psi minimum at 28 days, unless otherwise indicated.
 2. Slump Limits: 8 inches minimum for concrete containing high-range water-reducing admixture (super-plasticizer); 3 inches for other concrete.
 3. Air Content: Four percent to seven percent entrained air.

1.3 RELATED MATERIALS

- A. Lane and Parking Area Paint: Refer to Section 32 17 23 – Pavement Markings.
 1. Color: White.

1.4 CONCRETE FINISHING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture.

- B. After floating, test surface for trueness with a ten foot straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide a continuous smooth finish.
- C. Work edges of slabs, gutters, back top edge of curb, and formed joints with an edging tool, and round to 1/2 inch radius, unless otherwise indicated. Eliminate tool marks on concrete surface.
- D. After completion of floating and when excess moisture or surface sheen has disappeared, complete troweling and finish surface as follows:
 - 1. Broom finish by drawing a fine-hair concrete finishing broom across concrete surface perpendicular to line of traffic and according to sample panel of at least ten feet by ten feet, accepted by Architect.
 - a. On inclined slab surfaces, provide a coarse, non-slip finish by scoring surface with a stiff-bristled broom, perpendicular to line of traffic.
- E. After completion of floating and troweling of exposed aggregate concrete when excess moisture or surface sheen has disappeared, complete finishing by fine-spraying with water while brushing. If aggregate is dislodged, delay the operation. Continue washing and brushing until flush water runs clear and there is no noticeable cement film left on the aggregate.
- F. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Architect.

END OF SECTION

SECTION 32 14 13
CONCRETE UNIT PAVING

PART 1 PRODUCTS

1.1 MANUFACTURERS AND PRODUCTS

A. Acceptable Manufacturers:

1. Basalite Concrete Products, LLC, Tracy, CA; 800-266-3670, www.basalite.com.
Product: San Francisco Cobblestone Interlocking Paving Stones, Positano color blend.
2. HC Muddox/Interstate Brick, Sacramento, CA; 800-776-1244, www.hcmuddox.com.
3. Interpace Industries, Ogden UT; 801-782-7933; www.interpacebrick.com.

1.2 PRECAST CONCRETE UNIT PAVERS

A. Concrete Pavers: Solid interlocking paving units complying with ASTM C936, made from normal-weight aggregates.

1. Thickness: 60 mm.
2. Sizes:
 - a. 11 inches long x 8.25 inches wide.
 - b. 8.25 inches long x 5.5 inches wide.
 - c. 5.5 inches long x 5.5 inches wide.
3. Color: As selected by Architect.
4. Pavers shall have a slip-resistant finish.

1.3 ACCESSORIES

- A. Job-Built Concrete Edge Restraints: Comply with Section 03 30 00 requirements for normal-weight, air-entrained, ready-mixed concrete with minimum 28-day compressive strength of 3000 psi.
- B. Compressible Foam Filler: Preformed strips complying with ASTM D1056, Grade 2A1.

1.4 AGGREGATE SETTING-BED MATERIALS

- A. Graded Aggregate for Base: Sound, crushed stone or gravel complying with ASTM D2940, base material.
 1. Compacted Base Course; 6 inches thick, minimum.
- B. Sand for Leveling Course: Sound, sharp, washed, natural sand or crushed stone complying with gradation requirements in ASTM C33 for fine aggregate.
- C. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 sieve and no more than ten percent passing No. 200 sieve.
 1. Color: As selected by Architect.

- D. Herbicide: Commercial chemical for weed control, registered with the EPA and acceptable to authorities having jurisdiction at Project site. Provide in granular, liquid, or wettable powder form.

END OF SECTION

