COUNTY OF ALBANY

REQUEST FOR BIDS
SHAKER PLACE NURSING AND REHABILITATION CENTER

RFB #2024-150

SHAKER PLACE CAFÉ PROJECT

VOLUME 2

ALBANY COUNTY DEPARTMENT OF GENERAL SERVICES
PURCHASING DIVISION
PAMELA O NEILL, PURCHASING AGENT
112 STATE STREET, ROOM 1000
ALBANY, NY 12207

VOLUME 2

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ALBANY COUNTY SHAKER PLACE REHABILITATION & NURSING CENTER CAFÉ RENOVATION
ALBANY, NEW YORK

October 6, 2023

OWNER	County of Albany Shaker Place Nursing Home Albany, New York
ARCHITECT	Angerame Architects, P.C. 30 Essex Street Albany, New York 12206 (518) 454-9300
STRUCTURAL ENGINEER	MRH Engineering, P.C. 20 Bayberry Drive Queensbury, New York 12804 (518) 792-4042
MECHANICAL/PLUMBING/ ELECTRICAL ENGINEER	Engineered Solutions 646 Plank Road, #104 Clifton Park, New York 12065 (518) 280-2410

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Fibrous Reinforcement: Section 032101.

B. Vapor Retarder Under Slabs on Grade: Section 072600.

1.02 REFERENCES

A. Except as shown or specified otherwise, the Work of this Section shall conform to the requirements of Specifications for Structural Concrete for Buildings ACI 301-16 of the American Concrete Institute.

1.03 DEFINITIONS (Amendments to ACI 301, Section 1.2):

A. Exposed Construction: Exposed to view.

1.04 SUBMITTALS

A. Submittals Package: Submit product data for design mix(es) and materials for concrete specified below at the same time as a package.

B. Shop Drawings: Placing drawings for bar reinforcement.

C. Product Data:
1. Concrete design mix(es) with name and location of batching plant.
2. Portland Cement: Brand and manufacturer's name.
3. Fly Ash: Name and location of source, and DOT test numbers.
4. Air-entraining Admixture: Brand and manufacturer's name.
5. Water-reducing Admixture: Brand and manufacturer's name.
6. Aggregates: Name and location of source, and DOT test numbers.
7. Lightweight Coarse Aggregate: Brand and manufacturer's name
8. Chemical Hardener (Dustproofing): Brand and manufacturer's name, and application instructions.
9. Chemical Curing and Anti-Spalling Compound: Brand and manufacturer's name, and application instructions.
10. Bonding Agent (Adhesive): Brand and manufacturer's name, and preparation and application instructions.
11. Expansion Joint Filler: Brand and manufacturer's name.
12. Emery Aggregate: Brand and manufacturer's name, and application instructions.

D. Samples:

1. Fabric Reinforcement: 8 inches square.
2. Bar Supports: Full size.

E. Quality Control Submittals:

1. Certificates: Affidavit required under Quality Assurance Article.

1.05 QUALITY ASSURANCE

A. Concrete batching plant shall be currently approved as a concrete supplier by the New York State Department of Transportation.

B. Fly ash supplier shall be currently approved as a fly ash supplier by the New York State Department of Transportation.

C. Certifications: Affidavit by the bar reinforcement manufacturer certifying that bar material meets the contract requirements.

1. Submit evidence consisting of certification of source of material, copies of purchase orders and manufacturer's certifications. For stock material, submit copies of latest mill or purchase orders for material replacement.
   a. Documentation to confirm compliance with General Conditions Article 25.4 Domestic Steel.
2. Fabricator's and Erector's Qualifications Data: Name and experience of fabricator and erector.

D. The Contractor agrees, that if the value of this contract exceeds $100,000 all structural steel, reinforcing steel and other major steel items to be incorporated in the Work of this Contract shall be produced and made in whole or substantial part in the United States, its territories or possessions.

E. Source Quality Control: The Director reserves the right to inspect and approve the following items, at his own discretion, either with his own forces or with a designated inspection agency:

1. Batching and mixing facilities and equipment.
2. Sources of materials.

1.06 STORAGE

A. Store materials so as to insure the preservation of their quality and fitness for the Work. Materials, even though accepted prior to storage, are subject to inspection and shall meet the requirements of the Contract before their use in the Work.

PART 2 PRODUCTS

2.01 MATERIALS (Amendments to ACI 301, Section 4, for Normal Weight Concrete and Section 7, for Lightweight Concrete):

A. Water-reducing Admixture: ASTM C 494, Type A, and on the New York State Department of Transportation's current "Approved List".

B. Fly Ash (Pozzolans): ASTM C 618, including Table 1A (except for footnote A), Class F except that loss on ignition shall not exceed 4.0 percent.

C. Chemical Curing and Anti-Spalling Compound: ASTM C-309, Type 1D, Class B, with a minimum 18 percent total solids content. No thinning of material allowed.
   1. SureCure Emulsion, Kaufman Products, Inc. 3811 Curtis Avenue, Baltimore, MD 21226, (800) 637-6372.
   2. Cure & Seal 25 percent (J-22UV) by Dayton Superior Corp., 1125 Byers Rd., Miamisburg, OH 45342, (800) 745-3700.
   3. MasterKure CC 200 WB by Master Builders/ BASF Building Systems, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 628-9990.

D. Chemical Hardener (Dustproofing): Colorless aqueous solution of magnesium-zinc fluosilicate. Approved products include:
   1. MasterKure HD 300WB by Master Builders/ BASF Building Systems, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 628-9990.
   2. Surfhard by The Euclid Chemical Co., 19218 Redwood Rd., Cleveland, OH 44110, (216) 531-9222.
   3. Liqui-Hard by W.R. Meadows, Inc., PO Box 543, Elgin, IL 60121, (847) 683-4500.
   4. FluoHard by L & M Construction Chemicals, Inc., 14851 Calhoun Rd., Omaha, NE 68152, (402) 453-6600.
   5. Armortop by Anti Hydro International, Inc., 265 Badger Ave., Newark, NJ 07108, (800) 777-1773.
   6. Diamond by Kaufman Products, Inc., 3811 Curtis Avenue, Baltimore, MD 21226, (800) 637-6372.
   7. Basis of Design: "Euco Diamond Hard" by The Euclid Chemical Co

E. Type 1 Expansion Joint Filler: Preformed, resilient, non-extruding cork units; ASTM D 1752, Type II.

H. Chamfer Strips: Wood, metal, PVC or rubber; one inch chamfer.

I. Epoxy Bonding Agent (Adhesive): 100 percent solids epoxy-resin-base bonding compound, complying with ASTM C 881, Types I, II, IV and V, Grade 2 (horizontal areas) or Grade 3 (overhead/vertical areas), and Class B (40-60 degrees Fahrenheit) or Class C (60 degree Fahrenheit and above).
   1. SurePoxy HM Series by Kaufman Products, Inc., 3811 Curtis Avenue, Baltimore, MD 21226, (800) 637-6372.
   2. Sikadur Hi-Mod 32 by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071, (800) 933-7452.
   3. MasterEmaco ADH 327 RS by by Master Builders/ BASF Building

Systems, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 628-9990.

J. Emery Aggregate: Natural emery, crushed, polyhedral in shape, with not more than 10 percent flat or elongated pieces, properly screened, graded and packaged in the manufacturer's plant, and delivered to the site in sealed, labeled packages. Approved products include:
   1. Emerundum by Anti Hydro International, Inc., 265 Badger Ave., Newark, NJ 07108, (800) 777-1773.
   2. Non-Slip Aggregate by Setcon Industries, Inc., 5 Mathews Ave., Riverdale, NJ 07457-1020, (201) 283-0500.
   3. MasterTop 120SR by Master Builders/ BASF Building Systems, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 628-9990.

2.02 PROPORTIONING (Amendments to ACI 301, Sections 4 & 7):

A. Compressive Strength: As required by ACI 318-14 Table 19.3.2.1. "Requirements for concrete by exposure class".

B. Weight: Normal, except as indicated below:
   1. Lightweight Concrete (for floor fills): Air-dry unit weight between 95 and 115 lb/cu ft.

C. Durability: Concrete shall be air-entrained. Design air content shall be according to ACI 318-14 Table 19.3.2.1 "Requirements for concrete by exposure class", and ACI 318-14 Table 19.3.3.1 "Total air content for concrete exposed to cycles of freezing and thawing", with an allowable tolerance of plus or minus 1.5 percent for total air content. Entrained air shall be provided by use of an approved air-entraining admixture. Air-entrained cement shall not be used.

D. Slump: Maximum 4 inches; minimum 1 inch before the addition of any water-reducing admixtures or high-range water-reducing admixtures (superplasticizers) at the Site.

E. Admixtures: Do not use admixtures in concrete unless specified or approved in writing by the Director.

F. Selection of Proportions: Concrete proportions shall be established on the basis of previous field experience or laboratory trial batches, unless otherwise approved in writing by the Director.
   1. Optional Material: Fly ash may be substituted for (Portland) cement in normal weight concrete up to a maximum of 15 percent by weight of the required minimum (Portland) cement. If fly ash is incorporated in a concrete design mix, make necessary adjustments to the design mix to compensate for the use of fly ash as a partial replacement for (Portland) cement.
      a. Adjustments shall include the required increase in air-entraining admixture to provide the specified air content.

b. Lower early strength of the concrete shall be considered in deciding when to remove formwork.

2.03 REINFORCEMENT (Amendments to ACI 301, Section 3):

A. Bar Reinforcement: ASTM A 615, Grade 60, deformed steel bars.

B. Fabric Reinforcement: ASTM A 185, welded wire fabric, fabricated into flat sheets unless otherwise indicated.

C. Bar Supports: Galvanized steel or AISI Type 430 stainless steel, and without plastic tips.

D. Tie Wire: Black annealed wire, 16-1/2 gage or heavier.

2.04 JOINTS AND EMBEDDED ITEMS (Amendments to ACI 301, Section 5.3.2.6):

A. Obtain bond at construction joints by the use of bonding agent (adhesive) in accordance w/section 5.2.1.7 or the use of cement grout.

2.05 PRODUCTION (Amendments to ACI 301, Section 5):

A. Provide ready-mixed concrete, either central-mixed or truck-mixed.

PART 3 EXECUTION

3.01 EXAMINATION AND PREPARATION

A. Do not use items of aluminum for mixing, chuting, conveying, forming or finishing concrete, except magnesium alloy tools may be used for finishing.

B. Keep excavations free of water. Do not deposit concrete in water.

C. Hardened concrete, reinforcement, forms, and earth which will be in contact with fresh concrete shall be free from frost at the time of concrete placement.

D. Prior to placement of concrete, remove all hardened concrete spillage and foreign materials from the space to be occupied by the concrete.

3.02 FORMWORK (Amendments to ACI 301, Section 2):

A. The formwork shall be designed for loads, lateral pressure, and allowable stresses outlined in Chapter 4 - Design of “Guide to Formwork for Concrete” (ACI 347-14).

B. All formwork shall be removed after the concrete has sufficiently hardened, except in inaccessible spaces where approved.

C. After the ends or end fasteners of form ties have been removed, the embedded portion of the ties shall terminate not less than 3/4 inch from the formed surfaces of concrete.

3.03 PLACING REINFORCEMENT (Amendments to ACI 301, Section 3):

A. At the time concrete is placed, reinforcement shall be free of mud, oil, loose rust, loose mill scale, and other materials or coatings that may adversely affect or reduce the bond.

3.04 PLACING CONCRETE (Amendments to ACI 301, Section 5):

A. Operation of truck mixers and agitators and discharge limitations shall conform to the requirements of ASTM C 94.

B. Do not allow concrete to free fall more than 4 feet.

3.05 FINISHING FORMED SURFACES (Amendments to ACI 301, Section 5.3.3):

A. Finish Schedule: Except where indicated otherwise on the Drawings, provide the finishes below:
   1. Rough Form Finish for concrete surfaces not exposed to view.
   2. Smooth Form Finish for concrete surfaces exposed to view.

3.06 FINISHING SLABS (Amendments to ACI 301, Section 5.3.4):

A. Slabs On Grade: Provide key type joints unless otherwise shown. Tool exposed joints.

B. Finish Schedule: Except where indicated otherwise on the Drawings, provide the finishes below:
   1. Floated Finish for:
      a. Treads and platforms of exterior steps and stairs.
      b. Slabs and fill over which waterproofing, roofing, vapor barrier, insulation, terrazzo, or resin bound flooring is required.
   2. Troweled Finish for:
      a. Interior slabs that are to be exposed to view.
      b. Slabs and fill over which resilient wood flooring, resilient tile or sheet flooring, carpet, or thin-film coating system is required.
      c. Slabs and fill over which thin-set ceramic tile is required, except fine-broom finished surface.
      d. Treads and platforms of interior steps and stairs.
   3. Broom or Belt Finish for:

a. Exterior slabs. Texture, as approved by the Director's Representative.

4. Scratched Finish for:
   a. Surfaces to be covered with ceramic tile set in a bonded thick mortar bed, except screed to a Class B tolerance.
   b. Surfaces to be covered with floor topping.
5. Integral Emery Aggregate Surfacing with Floated Finish for:
   a. Interior pedestrian ramps.

C. Finishing, General: Provide monolithic finishes on concrete floors and slabs without the addition of mortar or other filler material. Finish surfaces in true planes, true to line, with particular care taken during screeding to maintain an excess of concrete in front of the screed so as to prevent low spots. Screed and darby concrete to true planes while plastic and before free water rises to the surface. Do not perform finishing operations during the time free water (bleeding) is on the surface.

D. Integral Emery Aggregate Surfacing: Provide a nonslip "dry shake" finish with emery aggregate. Apply emery aggregate in accordance with the manufacturer's printed application instructions for a heavy duty nonslip surface, unless otherwise indicated.

3.07 CURING AND PROTECTION (Amendments to ACI 301, Section 5.3.6):

A. Maintain concrete surfaces in a moist condition for at least 7 days after placing, except where otherwise indicated. Do not use curing compound.
   1. For surfaces of exterior slabs (on grade), apply chemical curing and anti-spalling compound in accordance with the recommendations of the manufacturer.

3.08 CHEMICAL HARDENER (DUSTPROOFING)

A. Apply chemical hardener to all troweled finished interior floors which are to be left exposed.

B. Do not apply chemical hardener until concrete has cured the number of days recommended in manufacturer's instructions.

C. Prepare surfaces and apply chemical hardener in accordance with manufacturer's printed instructions and recommendations.

3.09 FIELD QUALITY CONTROL (Amendments to ACI 301, Section 1):

A. Make available to the Director's Representatives whatever test samples are required to make tests. Furnish shipping boxes for compression test cylinders.

END OF SECTION 03 3001

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section includes an underlayment that consists of a blend of Portland cement and other hydraulic cements that is used to level and smooth interior concrete, terrazzo, ceramic and quarry tile, epoxy coating systems and non-water-soluble adhesive reside on concrete.

B. ARDEX K 40™ RAPID Rapid, High Flow Self-Leveling Underlayment

C. Selected ARDEX Primer

D. ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair

E. ARDEX FEATHER FINISH® Self-Drying Cement Based Finish Underlayment

F. ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant

G. Related Sections include the following:

H. Section 03 30 00, Cast-In-Place Concrete

I. Division 09 Flooring Sections

1.3 REFERENCES

A. ASTM C109M, Compressive Strength Air-Cure Only

B. ASTM E10M, Standard Test Method for Brinell Hardness

C. ASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes

D. ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.

B. Qualification Data: For Installer

1.5 QUALITY ASSURANCE

A. Installation of the ARDEX product must be completed by a factory-trained applicator, such as an ARDEX LevelMaster® Elite, Choice Contractor or INSTALL Substrate Prep Certified Installer, using mixing equipment and tools approved by the manufacturer. Contact ARDEX Americas (724) 203-5000 for a list of recommended installers.

B. Product must have hydraulic cement-based inorganic binder content as the primary binder which includes Portland cement per ASTM C150: Standard Specification for Portland cement and other specialty hydraulic cements. Gypsum-based products are not acceptable.

C. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of products for not less than 10 years. Contact Manufacturer Representative prior to installation.

1.6 WARRANTY:

A. ARDEX K 40™ RAPID installed as part of a floor system, shall be installed in conjunction with the recommended ARDEX Tile & Stone Installation Materials or WW HENRY Flooring Adhesive, as appropriate, to provide the ARDEX SystemOne comprehensive warranty, depending on the system installed.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.

B. Store products in a dry area with temperature maintained between 50° and 85°F (10° and 29°C) and protect from direct sunlight.

C. Handle products in accordance with manufacturer's printed recommendations.

1.8 PROJECT CONDITIONS

A. Do not install material below 50°F (10°C) surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if substrate is warm and follow warm weather instructions available from the ARDEX Technical Service Department.

PART- 2 PRODUCTS

2.1 MATERIALS

A. Material Name: ARDEX K 40 RAPID

B. Substitution requests shall be considered in accordance with contract provisions and the performance requirements outlined in this document.

2.2 HYDRAULIC CEMENT UNDERLAYMENT

A. Hydraulic Cement-based Self-Leveling Underlayment Acceptable Products:

B. ARDEX K 40™ RAPID; manufactured by ARDEX Americas, USA, (724) 203-5000, www.ardexamericas.com

C. Selected ARDEX Primer dependent on substrate, and absorbency of substrate and moisture control requirements. See ARDEX K 40 RAPID Technical Data sheet for further information.

D. Performance and Physical Properties: Meet or exceed the following values for material cured at 73° F+/-3°F (23° C+/-3°C) and 50% +/-5% relative humidity:

E. Mixing: Barrel Mix or Pump

F. Flow Time: 10 minutes

G. Walkable: 60 – 90 minutes

H. Compressive Strength: 8,000 psi (562 kg/cm2) at 28 days, ASTM C109M

I. Flexural Strength: 2,000 psi (140.6 kg/cm2) at 28 days, ASTM C348

J. h. VOC: 0

2.3 CRACK AND JOINT REPAIR

A. Low Viscosity Rigid Polyurethane Crack and Joint Repair; ARDEX ARDIFIX™; Manufactured by ARDEX Americas; USA; 724-203-5000, www.ardexamericas.com

B. Semi-Rigid Joint Sealant; ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant; Manufactured by ARDEX Americas; USA; 724-203-5000, www.ardexamericas.com

2.4 PATCH

A. ARDEX FEATHER FINISH® Self-Drying Cement Based Finished Underlayment

PART- 3 EXECUTION

3.1 PREPARATION

A. General: Prepare substrate in accordance with manufacturer's instructions.

1. Shot blasting or other mechanical means must be used for Prop Pre. Sanding is not a sufficient means of cleaning or preparing concrete. Do no use acid etching, adhesive removers, solvents or sweeping compounds, as these are bond breakers.

2. Handle and dispose of asbestos and other hazardous materials in accordance with prevailing regulations, which supersede the recommendations in this document.

3. All substrates must be sound, solid and thoroughly clean of all bond-breaking contaminants, including but not limited to overwatered or otherwise loose or week material, unapproved sealers, unsuitable adhesive residues, and patching and leveling materials.

4. Depending on the selected moisture control system or primer, additional prep may be needed. Please see the technical data sheet.

B. Crack and Joint Preparation:

1. Moving Joints and Moving Cracks – Honor all moving joints and moving cracks up through the underlayment. A flexible sealing compound such as ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant may be installed.

2. Saw Cuts, Dormant Control Joints and Dormant Cracks – Fill all dormant control joints and dormant cracks with ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair or ARDEX FEATHER FINISH® Self-Drying, Cement-Based Finish Underlayment as recommended by the manufacturer.

3. If a moisture control system will be installed, the crack and joint preparation recommendations will differ. Please see the technical data sheet.

3.2 APPLICATION

A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.

B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.

C. Priming: Comply with manufacturer's printed instructions.

D. Mixing: Comply with manufacturer's printed instructions. Pumping: Product can be pumped. Please contact the ARDEX Technical Service Department.

E. Application: Comply with manufacturer's printed instructions.

F. Curing: The cure time is dependent on the installed thickness and the selected finish flooring. See the Technical Data sheet for further information.

3.3 FIELD QUALITY CONTROL

A. Where specified, field sampling of the ARDEX underlayment is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

3.4 PROTECTION

A. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

END OF SECTION 03 5416

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section includes but is not limited to the following:

1. Structural steel.
2. Field-installed shear connectors.
3. Grout.

B. Related Requirements:

1. Section 05 5000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame miscellaneous steel fabrications and other steel items not defined as structural steel.
2. Section 053100 "Steel Decking" for field installation of shear connectors through deck.
3. Section 09 9100 " Exterior and High Performance Paints and Coatings " and Section 09 9000 "Painting" for surface-preparation and priming requirements.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 COORDINATION

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

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.

2. Include embedment Drawings.

3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.

4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

C. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Welding certificates.

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

C. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.

2. Direct-tension indicators.

3. Tension-control, high-strength, bolt-nut-washer assemblies.

4. Shear stud connectors.

5. Shop primers.

6. Nonshrink grout.

D. Survey of existing conditions, anchor bolt locations and leveling plate elevations..

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

B. Installer Qualifications: A AISC qualified installer having a minimum of 5 years of continuous documented experience with projects of similar scope and complexity..

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

D. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.

2. AISC 360.

3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.

2. Clean and relubricate bolts and nuts that become dry or rusty before use.

3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART- 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC 360.

2. Use Allowable Stress Design; data are given at service-load level.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992/A 992M.

B. Channels, Angless: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M.

D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.

E. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.

1. Weight Class: Standard weight unless noted otherwise.

2. Finish: Black except where indicated to be galvanized.

F. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.

B. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating.

2. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with mechanically deposited zinc coating finish.

C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex or round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Plain .

D. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

E. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.

1. Nuts: ASTM A 563 heavy-hex carbon steel.

2. Plate Washers: ASTM A 36/A 36M carbon steel.

3. Washers: ASTM F 436, Type 1, hardened carbon steel.

4. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.

F. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 heavy-hex carbon steel.

2. Washers: ASTM A 36/A 36M carbon steel.

3. Finish: Plain unless noted otherwise.

G. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

H. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.4 REPAIR PAINT

A. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

2.5 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.

2. Fabricate beams with rolling camber up.

3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.

4. Mark and match-mark materials for field assembly.

5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill,or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."

F. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.

G. Welded Door Frames: Build up welded door frames attached to structural-steel frame. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk machine screws, uniformly spaced not more than 10 inches o.c. unless otherwise indicated.

H. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.

2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.

3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened unless noted otherwise. Slip critical at braced frames and members with revered loading unless noted otherwise.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 SHOP PRIMING

A. Shop prime the following steel surfaces:

1. Exterior surfaces including steel associated with canopies and steel roof top dunnage.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at 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.

2.9 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

2. Galvanize lintels shelf angles and welded door frames attached to structural-steel frame and located in exterior walls.

2.10 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.

2. Ultrasonic Inspection: ASTM E 164.

D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.

2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

E. Prepare test and inspection reports.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with fabrication and erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on setting nuts as detailed.

2. Weld plate washers to top of baseplate.

3. Snug-tighten anchor rods after supported members have been positioned and plumbed.

4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.

2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened unless noted otherwise. Slip critical at braced frames and members with revered loading unless noted otherwise.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.

3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.

2. Verify weld materials and inspect welds.

3. Verify connection materials and inspect high-strength bolted connections.

B. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

a. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.

b. Ultrasonic Inspection: ASTM E 164.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Painting: Cleaning and touchup painting are specified in Section 09 9100 " Exterior and High Performance Paints and Coatings " and Section 09 9000 "Painting."

END OF SECTION 05 1200

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes:

B. Roof deck.

C. Related Requirements:

D. Section 03 3000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.

E. Section 05 1200 "Structural Steel Framing" for shop- and field-welded shear connectors.

F. Section 05 5000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

1.3 SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings:

C. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

D. Welding certificates.

E. Product Certificates: For each type of steel deck.

F. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:

G. Power-actuated mechanical fasteners.

H. Acoustical roof deck.

I. Field quality-control reports.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

C. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART- 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

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

2.2 ROOF DECK

A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:

B. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 G60 zinc coating.

C. Deck Profile: As indicated.

A. Profile Depth**:** As indicated

B. Design Uncoated-Steel Thickness: As indicated

C. Span Condition: Double span.

D. Side Laps: Overlapped

2.3 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

A. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

B. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

C. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

E. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.

F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

G. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.

H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch thick, with factory- punched hole of 3/8-inch minimum diameter.

I. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.

J. Galvanizing Repair Paint: ASTM A 780/A 780M

K. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.

A. Install temporary shoring before placing deck panels if required to meet deflection limitations.

B. Locate deck bundles to prevent overloading of supporting members.

C. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

D. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF-DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:

1. Weld Diameter: 5/8 inch, nominal.

2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds 12 inches apart in the field of roof and 6 inches apart in roof corners and perimeter.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18 inches, and as follows:

1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.

2. Mechanically clinch or button punch.

3. Fasten with a minimum of 1-1/2-inch-long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:

1. End Joints: Lapped 2 inches minimum.

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld or[mechanically fasten flanges to top of deck. Space attachment not more than 12 inches apart with at least one attachment at each corner.

1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.

1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Field welds will be subject to inspection.

C. Prepare test and inspection reports.

3.5 PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

END OF SECTION 05 3100

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section includes but is not limited to the following:

1. Loose bearing and leveling plates.
2. Loose steel lintels and angles.
3. Miscellaneous accessories as shown on architectural drawings.

1.3 DEFINITIONS

A. Definitions in ASTM E 985 for railing-related terms apply to this section.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Condition of Contract and Division-1 Specification Sections.

B. Product data for products used in miscellaneous metal fabrications.

C. Shop drawings detailing fabrication and erection of each metal fabrication indicated.

1.5 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the following codes, standards and specifications, except as otherwise shown and specified:

1. AISC “Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings”, including “Commentary of the AISC Specifications”.
2. AISC “Specifications for the Design of Cold-Formed Steel Structured Members.”
3. AWS “Structural Welding Code”.

B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualifications Procedures".

1.6 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.

PART- 2 PRODUCTS

2.1 FERROUS METALS

A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variation in flatness exceeding those permitted by reference standards for stretcher-level sheet.

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

C. Steel Pipe: ASTM A 53; finish type, and weight class as follows:

1. Galvanized finish to receive paint for exterior installation and high moisture areas.

2. Type S, Grade B, standard weight (schedule 40), unless otherwise indicated.

D. Malleable Iron Castings: ASTM A 47, Grade 32510.

E. Fasteners: Use fasteners of same basic metal. Do not use metals that are corrosive or incompatible with metals joined.

F. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as support rails, unless otherwise indicated.

G. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.

2.2 GROUT AND ANCHORING CEMENT

A. Non-shrink Nonmetallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRDC 621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

B. Non-shrink Non-metallic Grout:

1. "Kemset"; Chem-Masters Corp.

2. "Cyrstex"; L&M Construction Chemicals, Inc.

3. “Five Star Grout”; United States Grout.

4. “Masterflow 713”; Master Builders, Inc.

5. “Sonogrout”; Sonneborn Building Product Div., Rexnord Chemical Products, Inc.

2.3 FASTENERS

A. General: Provide zinc-coated fasteners for exterior use or when built into exterior walls. Select fasteners for the type, grade and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

C. Lag Bolts: Square head type, FS FF-B-561.

D. Machine Screws: Cadmium plated steel, FS FF-S-92.

E. Wood Screws: Flat head carbon steel, FS FF-S-111.

F. Plain Washers: Round, carbon steel, FS FF-W-92.

G. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, [non-drilling], Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.

H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, calls and style as required.

I. Lock Washers: Helical spring type carbon steel, FS FF-W-84,

2.4 PAINT

A. Shop Primer for Ferrous Metal: Manufacturer’s or Fabricator’s standard, fast-curing, lead-free universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.

B. Galvanizing: ASTM A 123 for fabricated and unfabricated steel products made of uncoated rolled, pressed and forged steel shapes, plates and bars.

C. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, with dry film containing not less than 94% zinc dust by weight, and complying with DOD-P-21935 or SSPC-Paint-20.

D. Miscellaneous Framing and Supports: Provide miscellaneous steel framing and support which are not a part of the structural steel framework, shown or specified in Section 051200 and/or 051213, and are required to complete the work.

E. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of the required dimensions to receive adjacent grating, plates, doors, or other work to be retained by the framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars of all welded construction using mitered corners, welded brackets and splice plates and a minimum number of joints for field connection. Cut, drill and tap units to receive hardware and similar items to be anchored to the work.

2.5 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required.

2.6 MISCELLANEOUS FRAMING AND SUPPORT

A. General: Provide steel framing and supports for applications indicated or which are not a part of structural steel framework, as required to complete work.

B. Fabricate units to sizes, shapes and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware, hangers, and similar items.

2.7 FINISHES, GENERAL

A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designation of finishes.

B. Finish metal fabrications after assembly.

2.8 STEEL AND IRON FINISHES

A. Exterior Galvanizing: For those items indicated for galvanizing, apply zinc coating by the hot-dip process compliance with the following requirements.

1. ASTM A 153, for galvanizing iron and steel hardware.
2. ASTM A 123, for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299" thick and heavier.
3. Interiors (Primer Zone 1A): SSPC-SP3 "Power Tool Cleaning."

B. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.

PART- 3 EXECUTION

3.1 PREPARATION

A. Coordinate and furnish anchorage's setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

B. Center nosing's or tread widths with noses flush with riser faces and tread surfaces.

C. Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

3.2 FABRICATION, GENERAL

A. Fabricator shall design connections to properly transmit total reactions, moments, and axial forces either indicated on Drawings or reasonably inferred from information provided.

B. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

C. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

D. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

E. Shear and punch metals clearly and accurately. Remove bars.

F. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

G. Remove sharp or rough areas on exposed traffic surface.

H. Weld corners and seams continuously, to comply with AWS recommendations and the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

I. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersink) screws or bolts. Locate joints where least conspicuous.

J. Provide for anchorage of type indicated or required, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

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

L. Cut, reinforce, drill and up miscellaneous metal work as indicated to receive finish hardware screws, and similar items. Countersink all fasteners.

M. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

3.3 INSTALLATION, GENERAL

A. Comply with requirements of manufacturer.

B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

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

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

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

F. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work, and the following:

G. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

H. Obtain fusion without undercut or overlap.

I. Remove welding flux immediately.

J. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

K. Manufacturer Items: Install units as recommended by manufacturer with all required accessories.

3.4 ADJUSTING AND CLEANING

A. Touch-up Painting: Cleaning and touch-up painting of field welds, bolted connections and abraded areas of the shop paint on miscellaneous metal is specified in Division 9 Section “Painting” of these specifications.

B. For galvanized surfaces, clean welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION 05 5000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes: Framing with dimension lumber.

1. Installation of all doors and frames.

2. Installation of finish hardware.

3. Installation of specialty items.

4. Temporary work.

B. Related Requirements:

1. Section 061600 "Sheathing."

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

B. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

C. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

D. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

E. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

F. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.

2. Fire-retardant-treated wood.

3. Power-driven fasteners.

4. Powder-actuated fasteners.

5. Expansion anchors.

6. Metal framing anchors.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

PART- 2 PRODUCTS: NOT USED

PART- 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with member's plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

G. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal-thickness.

3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than100 sq.ft. and to solidly fill space below partitions.

4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

I. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

J. ComplywithAWPAM4 for applying field treatment to cut surfaces of preservative-treated lumber.

K. Use inorganic boron for items that are continuously protected from liquid water. Use copper naphthenate for items not continuously protected from liquid water.

L. Securely attach rough carpentry work to substrate by anchoring and fastening asindicated, complying with the following:

1. NESNER-272 for power-driven fasteners. Table2304.9.1, "Fastening Schedule," in ICC's International Building Code.TableR602.3(1),"Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One-and Two-Family Dwellings.

M. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 TEMPORARY WORK

A. Provide temporary ladders for access to all floors and provide rubbish chutes in locations as required.

B. Provide tread protection at all concrete steps, stairs and platforms; install temporary handrails as required to make stairs safe and at all openings to vertical shafts exterior or penetrations through floor slabs.

C. Provide door jamb protection at all exterior door frames used for material ingress or egress; provide temporary batten doors as required to make building secure and weathertight.

D. Provide temporary closures at windows, exterior scaffolding, etc., as required to make building weather-tight and capable of maintaining required minimum working temperatures during cold weather construction.

E. All items of temporary construction to be of sound material and erected in such a manner as to prevent damage to underlying or adjacent surfaces, and to adequately protect personnel and property.

F. Provide all necessary barricades and safeguards required to protect or separate construction areas from public areas.

G. Upon completion of the project, remove all temporary work and repair any damages to permanent installation.

3.3 DOORS AND FRAMES

A. Receive, handle, store, erect, and brace metal door frames scheduled for installation in walls and partitions, interior and exterior. All frames to be erected plumb and square, set at a proper height above rough or finish floor. Secure to concrete openings with expansion bolts or power actuated fasteners. Install spreaders at midpoint of frame to prevent bow of jambs.

B. Receive, handle, store, and erect all hollow metal doors throughout the building. Hang doors in accordance with approved door and finish hardware schedules.

3.4 FINISH HARDWARE

A. Receive, handle, store and apply all items of finish hardware, including thresholds, and weather-stripping throughout the building. All items of finish hardware will arrive on the job properly marked and packaged to minimize the on-the-job sorting and distribution. Store in one designated room, use items in proper locations as there will be no “swapping” of hardware items.

B. Install all items plumb and true to insure smooth and proper operations of doors. Maintain precautions to prevent marring of adjacent surfaces or finish of hardware both during application and in subsequent operations.

C. Check all pressed steel frames and metal doors for reinforcing at surface applied hardware specified in Section 087000. DO NOT INSTALL DOORS IF SPECIFIED REINFORCING IS MISSING.

D. Arrange with painter to seal all door bottoms before hanging doors, if not completed at factory.

E. All other items of this section are to be installed in accordance with accepted practices of the industry, details on drawings or manufacturer’s recommendations.

F. All other items not specified in other section of work:

1. Installation shall be completed in a neat, secure manner using attachments supplied with accessories and in strict accordance with manufacturer’s instructions. Coordinate installation of required blocking.

G. Construct corners and intersections with not less than 3 studs. Install miscellaneous blocking and framing as shown and as required for support of facing materials, fixtures, specialty items, and trim.

1. Install continuous horizontal blocking row at mid-height of single-story partitions over 8’ high and at midpoint of multi-story partitions, using 2” thick members of width as wall or partitions.

H. Frame openings with multiple studs and headers. Install nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.

3.5 INSTALLATION OF CONSTRUCTION PANELS

A. General: Comply with applicable recommendations contained in From NO. E30, “APA Design/Construction Guide - Residential and Commercial,” for type of construction panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Plywood Backing Panels: Screw to supports 12” o.c., or ramset to concrete wall. Install panels in all telephone closet/rooms - on all walls over 18” wide

3.6 PROTECTION

A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 1000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes:

B. Wood, nails, bolts, screws, framing anchors and other rough hardware, and other items needed, and perform rough carpentry for the construction shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

C. Furnish and install wood furring.

D. Furnish and install blocking for:

E. Wood blocking for installation of custom or manufactured casework.

F. Toilet accessories furnished and/or installed by other Sections.

G. Wood blocking in conjunction with drywall partitions wall mounted items and equipment.

H. Wood blocking for grab bars, handrails and related wall mounted items.

I. Other locations where wood blocking is indicated on the Drawings.

J. Furnish and install all wood nailers in connection with roofing work including rooftop equipment bases and support curbs.

K. Furnish and install plywood backing panels at electrical and telecommunications closets.

L. Furnish and install wood blocking and plywood for TV wall brackets.

M. Concealed steel bracket supports.

N. Related Requirements:

O. Division 08 Section “Hollow Metal Frames”

1.3 REFERENCES

A. Dimension Lumber: Lumber of 2 inches' nominal or greater but less than 5 inches' nominal in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

C. NeLMA: Northeastern Lumber Manufacturers' Association.

D. NHLA: National Hardwood Lumber Association.

E. NLGA: National Lumber Grades Authority.

F. SPIB: The Southern Pine Inspection Bureau.

G. WCLIB: West Coast Lumber Inspection Bureau.

H. WWPA: Western Wood Products Association.

I. FM Global:

J. FM Global Property Loss Prevention Data Sheets 1-49 (FM Global 1-49), Perimeter Flashing, September 2000 revision.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

B. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

C. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

D. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

E. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

F. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility for Fire-Retardant-Treated Wood: Obtain each type of fire-retardant treated wood product from one source and by a single producer.

B. Single-Source Responsibility for Preservative-Treated Wood: Obtain each type of preservative-treated wood product from one source and by a single producer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. Load and unload material in a manner that prevents damage or breakage.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect, at no change in Contract Sum.

PART- 2 PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Certified Wood: Lumber and plywood shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

C. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

D. Provide dressed lumber, S4S, unless otherwise indicated.

E. General: Provide miscellaneous lumber and panels indicated for support or attachment of other construction, as follows:

F. Grades of Lumber and Species:

G. Wood Bucks, Blocking: Eastern Spruce No. 2 com mon; Southern Pine No. 2 common; Douglas Fir No. 2 common.

H. Plywood substools: APA Rated underlayment; Group 1, Exposure (Fire retardant treated).1, ¾” thickness, unless otherwise noted.

I. Plywood panels for electrical, security and telecommunications panels: APA graded BD INT, (touch sanded), ¾ inch thick (Fire retardant treated).

J. Plywood for TV wall bracket: APA Rated B-D, Group 2, Exposure 1, ¾ inch thick unless noted otherwise. (Fire retardant treated).

K. Plywood for parapets: APA Rated Sheathing, Exposure 1, ¾ inch thickness, unless noted otherwise.

L. Blockings concealed within walls: As indicated on drawings or as required for secure installation. (Fire retardant treated)

M. For blocking and nailers used for attachment of other items, select and cut lumber to eliminate knots or other defects.

N. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

B. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

E. Application: Treat items indicated on Drawings, and the following:

F. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

G. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.

H. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

C. Use treatment that does not promote corrosion of metal fasteners.

D. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

E. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

F. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.

G. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

2.4 WOOD BACKING SYSTEM

A. Provide backing system: Clark Dietrich, Danback Flexible wood back system or equal.

B. Material: ¾" CDX Doug Fir Dricon fire-retardant treated wood.

C. Dimensions: 5-1/8" x 48" (130mm x 1219mm)

2.5 CONSTRUCTION PANELS FOR BACKING

A. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant treated plywood panels with grade designation, APA C-D PLUGGED EXPOSURE 1, in thickness indicated, or if not otherwise indicated, not less than ¾ inch.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2. Where carpentry is pressure-preservative treated, provide fasteners of Type 304 stainless steel.

B. Rough Hardware: Furnish and install all rough hardware

1. Steel Items: Comply with ASTM A7 or ASTM A36.

2. Nails, Brads, and Staples: ASTM F 1667.

3. Power-Driven Fasteners: NES NER-272.

4. Wood Screws: ASME B18.6.1.

5. Screws for Fastening to Metal Framing: ASTM C 954, length as recommended by screw manufacturer for material being fastened.

6. Lag Bolts: ASME B18.2.1.

7. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

8. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

2.7 CONCEALED STEEL BRACKET SUPPORTS

A. Manufactured by A+M Hardware Inc, model EC-24' and C-24" or equal

PART- 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

B. Selection of lumber pieces

1. Carefully select the members.

2. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing and will allow making of proper connections.

3. Cut out and discard defects which render a piece unable to serve its intended function.

4. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold; as well as for improper cutting and fitting

C. Stockpile materials sufficiently in advance of need to assure their availability in a timely manner for this Work.

D. Do not permit materials not complying with the provisions of this Section to be brought onto or stored at the job site.

E. Promptly remove non-complying materials from the job site and replace with materials meeting the requirements of this Section.

F. Comply with preservative treated material manufacturer's product data, including product technical bulletins, product catalog installation instruction and product carton instructions for installation.

1. ACQ treated wood scraps and cut-offs should be disposed of i n a non-hazardous material lined landfill in accordance with local, state and federal regulations.

G. Set carpentry to required levels and lines, with member's plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.

H. Prevent direct contact between ACQ preservative treated material and aluminum. Maintain minimum of 1/4-inch space between treated wood and aluminum building components using polyethylene or nylon spacers, or maintain separation using minimum 10-mil. thick polyethylene film.

I. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

J. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

K. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

L. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

3.2 PLYWOOD SUBSTOOLS FOR EXTERIOR

A. Install plywood substools required for the installation of laminated plastic window stools. Install substools to framing, using countersunk flathead screws for metal framing and common nails for wood framing. Shim as required to assure a leveled top surface.

3.3 INSTALLATION OF WOOD SPREADERS AT DOORS FRAMES

A. During the installation of pressed metal door frames, after the steel spreader bar has been removed, install 2 x 4 wood spreaders at door opening, carefully dimensioned to permit square, true installation of door frames and doors.

B. Spreaders shall remain in place until doors are installed.

3.4 ALIGNMENT

A. On framing members to receive a finished surface, align the finish subsurface to vary not more than 1/8" from the plane of surfaces of adjacent furring and framing members.

3.5 INSTALLATION – ROOF NAILERS AND BLOCKING

A. Provide anchorage for nailers as required for roof and edging in accordance with the requirements of Factory Mutual Loss Prevention Data Bulletin # 1-49 and as indicated on Contract Drawings.

B. Secure roof nailers and blocking as indicated on the Drawings.

C. Ensure finished height of nailers is same as top surface of roof insulation within 1/4-inch.

3.6 CONCEALED STEEL BRACKETS

A. Install as recommended by manufacturer

3.7 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 1053

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. The extent of Architectural Woodwork is shown on the drawings and specified herein including, but not limited to, the following:

B. Fabrication and delivery to the site of all casework.

C. Plastic laminate Counters, and casework.

D. Interior wood casework to receive painted finish.

E. Casework hardware.

F. Interior Trim Work.

G. Interior wood columns.

H. Wood Cabinets and casework.

1.3 SUBMITTALS

A. Shop Drawings: Submit shop drawings on all items of architectural woodwork ascalled for in the Supplementary Conditions. Details shall be drawn in related or dimensional position with sections shown at full or quarter size.

B. Brochures: Submit manufacturer's descriptive literature of specialty items not manufactured by the architectural woodworker but included as part of his work.

C. Samples: Submit three samples of each species, cut and finish for woodwork which is to receive a transparent finish. Submit 18" long samples full member width and thickness (6" wide if plywood) finished - as specified on one face, on edge and one end. Submit three 12" square samples of each type and surface finish of plastic laminate. Samples will be reviewed by the Architect for appearance

only. Compliance with other requirements is the exclusive responsibility of the Contractor. Cabinet hardware; one unit of each type.

D. Submit two copies of certificates signed by the mill or woodwork shop, certifying that the architectural woodwork complies with the Quality Standard and Grade and other requirements as specified.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of woodwork.

B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards."

C. Solid Polymer Allowable Tolerances:

D. Variation in sheet dimension. 2%.

E. Variation in sheet thickness, 10%.

F. Location of openings, 1/8”

G. Variation in overall component size, 1/8”.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. LEED Submittals:

C. Product Data for Credit EQ 4.4:

D. For each composite-wood product used, documentation indicating that the bonding agent contains no urea formaldehyde.

E. For each adhesive used, documentation indicating that the adhesive contains no urea formaldehyde.

F. Certificates for Credit MR 7: Chain-of-custody certificates certifying that products specified to be made from certified wood comply with forest certification requirements. Include evidence that mill is certified for chain of custody by an FSC-accredited certification body.

G. Include statement indicating costs for each certified wood product.

H. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.6 SUBMITTALS

A. Product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing and installation, including cabinet hardware.

B. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.

C. Samples for initial selection purposes of the following in form of manufacturer's color charts consisting of actual units or sections of units showing full range colors, textures and patterns available for each type of material indicated.

D. Plastic laminate.

E. Factory-applied finishes.

F. Solid Surface materials.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver woodwork, until painting, wet work, grinding and similar operations which could damage, soil, or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas which meet the requirements specified for installation areas.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install work until building is enclosed, wet-work is completed and nominally dry, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not deliver millwork materials until relative humidity in the building can be maintained between 30 percent and 50 percent maximum.

C. The Installer must examine the substrate and the conditions under which the work under this section is to be performed, and notify the Contractor in writing of any unsatisfactory conditions. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

D. Do not install trim or casework that has not been back primed as specified.

E. Do not install composite interior molding until interior temperature conditions can be maintained at 60 deg F minimum and 80 deg F maximum.

F. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of work, where field measurements cannot be made without delaying of work, guarantee dimensions, and proceed with manufacture of woodwork without field measurements. Coordinate other construction to ensure that actual dimensions correspond to guaranteed dimensions.

PART- 2 PRODUCTS

2.1 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.

B. Provide certificates form AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.

C. Grade: Custom.

D. Type of Construction: Frameless.

E. Cabinet, Door, and Draw Front Interface Style: Flush overlay.

F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodworking quality standard.

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

H. Lab Designs.

I. Formica Corporation – "Premium FX".

J. Wilsonart Americas – "Commercial Collection".

K. Laminate Cladding for Exposed Surfaces:

L. Horizontal Surfaces: Grade HGL.

M. Post-Formed Surfaces: Grade HGP.

N. Vertical Surfaces: Grade VGS.

O. Door and Drawer Edge Banding: Color matched PVC.

P. Pattern Direction: As indicated.

Q. Pattern and Color: To be determined at later date.

R. Materials for Semi-Exposed Surfaces:

S. Surfaces Other Than Drawer Bodies: Thermoset decorative panels.

T. Draw Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.

U. Draw Bottoms: Thermoset decorative panels.

V. Dust Panels: 1/4-inch plywood or tempered hardboard above compartments and draws unless located directly under tops.

W. Solid-Surfacing Material Countertops: Homogeneous solid sheets of filled plastic resin comply with ISSFA-2.

X. Manufacturers:

Y. Avonite Surfaces – Acrylic Solid Surface.

Z. Dupont Corian.

AA. Formica Solid Surface.

BB. Wilsonart Americas.

CC. Edge Treatments: Double Eased Edges.

DD. Backsplashes: Height as indicated; Coved Backsplash (1/2")

EE. Pattern and Color: To be determined at a later date.

FF. Solid-Surfacing-Material integral sinks:

GG. Mounting: Seamed undermount.

HH. Color: As selected from manufacturers full range. Provide samples for selection.

II. Model Number: (Basis-of-Design Product model number by Dupont Polymers; Corian, unless otherwise noted):

JJ. Sink: Model 810, 16 ½" X 13 1/8" X 5 3/8" (accessible).

2.2 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with performance requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Use Exterior Type or Interior Type A. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Kiln-dry material after treatment.

B. Fire-Retardant Particleboard: Panels made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture with flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E 84.

C. Fire-Retardant Fiberboard: ANSI A208.2 medium-density fiberboard panels made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture with flame spread index of 25 or less and smoke-developed index of 200 or less per ASTM E 84.

2.3 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."

B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, self-closing.

C. Bar Pulls: Liberty 4”, Stainless Steel bar pull, # P13456L-SS-U1

D. Door Pulls: Richelieu, Aluminum, #31007596, 4 - 1/8” long.

E. Catches: Push-in magnetic catches, BHMA A156.9, B03131

F. Drawer Slides: BHMA A156.9, B05091.

G. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full extension type; zinc-plated steel ball-bearing slides.

H. Box Drawer Slides: Grade 1; for drawers, not more than 6 inches high and 24 inches wide.

I. File Drawer Slides: Grade 1HD-200; for drawers, more than 6 inches high or 24 inches wide.

J. Pencil Drawer Slides: Grade 1; for drawers, not more than 3 inches high and 24 inches wide.

K. Door Locks: BHMA A156.11, E07121.

L. Provide “Cam” style lock at each cabinet box

M. Manufacturer: National Cabinet Lock (or approved equal).

N. Model #: NL-C8000 series.

O. Drawer Locks: BHMA A156.11, E07041.

P. Provide “Cam” style lock at each cabinet box

Q. Manufacturer: National Cabinet Lock or approved equal

R. Model #: NL-C8000 series

S. Push Fit Fastener

T. Provide Push Fit fasteners as required

U. Manufacturer: Hafele

V. Model # Hespa frame component AS.

W. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

X. Satin Stainless Steel: BHMA 630.

Y. Grommets for Cable Passage through Countertops: 2 ½" (verify with owner) molded plastic grommets and matching plastic caps with slot for wire passage.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

2.5 FABRICATION

A. GENERAL: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.

B. Interior Woodwork Grade: Premium.

C. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.

D. Interior Standing and Running Trim:

E. For transparent-finished trim items wider than available lumber, use veneered construction. Do not glue for width.

F. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.

G. Assemble casings in plant except where limitations of access to place of installation require field assembly.

H. Plastic-Laminate-Faced Architectural Cabinets:

I. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installations, and other requirements.

    a. Provide certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.

J. Grade: Custom

K. Type of Construction: Frameless

L. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.

M. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicates as required by woodwork quality standard.

    a. Manufacturers: subject to compliance with requirements, provide products by one of the following:

        i. Formica Corporation.

        ii. Panolam Industries; Nevamar

        iii. Panolam Industries; Pionite.

        iv. Wilsonart International Holdings, Inc.

N. Laminate Cladding for Exposed Surfaces:

    a. Horizontal Surfaces: Grade HGL.

    b. Post formed Surfaces: Grade HGP.

    c. Vertical Surfaces: Grade VGS.

    d. Door and Drawer Edge Banding: Color Matches PVC.

    e. Pattern Direction: As indicated.

    f. Pattern and Color: As shows in Drawings.

O. Materials for Semi-Exposed Surfaces: (Kitchens).

    a. Surfaces Other Than Drawer Bodies: Thermoset decorative panels.

    b. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.

    c. Drawer Bottoms: Thermoset decorative panels.

P. PVC Edge Banding: Polyvinyl chloride edge banding made from thermoplastic resin. Color as chosen from manufacturer's full range of color samples.

Q. Dust Panels: 1/4 -inch plywood or tempered hardboard above compartments and drawers unless located directly under tops.

R. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of expose laminate surfaces complying with the following requirements.

    a. As Indicated by laminate manufacturer's designations.

S. Plastic-Laminate Countertops/Shelves:

T. High-Pressure Decorative Laminate Grade: HGS.

U. Colors, Patterns, and Finishes: Refer to Finish Matrix.

V. Edge Treatment: Vinyl edge banding to match adjacent laminate.

W. Solid-Surfacing-Material Countertops:

X. Solid-Surfacing-Material Thickness: 1/2 inch.

Y. Colors, Patterns, and Finishes: As indicated on Finish Matrix or as selected by Architect from manufacturer's full range.

Z. Fabricate tops in one piece with shop-applied backsplashes. Comply with solid surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

AA. Solid-Surfacing-Material Sinks:

BB. Solid-Surfacing-Material Thickness: As indicated by manufacturer's designations.

CC. Colors, Patterns, and Finishes: As indicated on Finish Matrix or as selected by Architect from manufacturer's full range.

DD. Install integral sink bowls in countertops in shop.

EE. Mounting: Seamed undermount.

FF. Tackboard:

GG. All-Natural Tacking surface by Claridge or equal.

HH. Color by Architect from full color range.

2.6 SHOP FINISHING

A. Finish architectural woodwork at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.

B. Back priming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling.

C. Transparent Finish:

D. Grade: Premium.

E. AWI Finish System: Catalyzed vinyl.

F. Staining: Match approved sample for color.

G. Wash Coat for Stained Finish: Apply a wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.

H. Open-Grain Woods: After staining (if any), apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.

I. Sheen: Semi-gloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART- 3 EXECUTION

3.1 GENERAL

A. Only experience and capable foremen and an adequate crew of skilled mechanics experienced in erecting finish carpentry and millwork shall be employed.

B. To permit fabricator of millwork to utilize his manufacturing process to best advantage, exact details of millwork construction are not always shown on drawings, but it is the intent of these specifications to secure a first-class finished product in all respects.

C. Fabricate millwork completely at shop as far as possible, and deliver ready to set in largest units consistent with convenient erection.

D. Work material in best manner, thoroughly blocked, mortised, tenoned, doweled and glued to require minimum use of nails or screws. All fastenings to be concealed.

E. Provide all millwork with fine sandpaper finish ready for painting and finishing. No sanding across grain permitted.

F. Round all exposed edges or corners of millwork on 1/16" radius unless otherwise shown on drawings.

G. Seal all edges of MDF.

3.2 INSTALLATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and back priming.

B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 in. Shim as required with concealed shims.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

F. Standing and Running Trim: Install with minimum number of joints possible, using full length pieces (from maximum length of lumber available) to greatest extent possible. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.

G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.

H. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish. Provide decorative washers at cabinet interiors.

I. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

3.3 FINISHING

A. For finishes of other millwork see Division 099000.

3.4 PROTECTION

A. Cover casework with 4-mil polyethylene film, for protection against soiling and deterioration during remainder of construction period.

END OF SECTION 06 4000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SECTION INCLUDES

A. Provide solid surfacing fabrications including but not limited to following:

1. Lavatory or laboratory tops with seamed bowls.
2. Lavatory or laboratory tops with undermount bowls.
3. Lavatory or laboratory tops with integral bowls.
4. Vanity tops.
5. Millwork counter tops with sinks and cove backsplashes.

1.3 RELATED SECTIONS:

A. Following description of work is included for reference only and shall not be presumed complete:

1. Waste management and disposal requirements: Section 01 7419, Waste Management and Disposal.
2. Provision of finish carpentry and architectural woodwork: Section 06 4000, Architectural Woodwork.
3. Provision of elastomeric joint sealants: Section 07 9200, Joint Sealants.
4. Provision of tile work: Section 09 3000, Tiling.
5. Provision of plumbing and plumbing fixtures: Division 22, Plumbing.

1.4 REFERENCES

A. Abbreviations and Acronyms:

1. LEED®: Leadership in Energy and Environmental Design; www.cagbc.org.

2. MDF: Medium Density Fiberboard.

3. SCAQMD: South Coast Air Quality Management District; www.aqmd.gov.

4. VOC: Volatile Organic Compound.

B. Definitions:

1. Solid Surface: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.5 REFERENCE STANDARDS:

A.	ANSI/NPA A208.2-09	- Medium Density Fiberboard (MDF) For Interior Applications
B.	ASTM C920-14a	- Standard Specification for Elastomeric Joint Sealants
C.	ASTM D638-10	- Standard Test Method for Tensile Properties of Plastics
D.	ASTM D785-08	- Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials
E.	ASTM D790-10	- Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
F.	ASTM D5420-10	- Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)
G.	ASTM E84-14	- Standard Test Method for Surface Burning Characteristics of Building Materials
H.	ASTM E228-11	- Standard Test Method for Linear Thermal Expansion of Solid Materials with a Push-Rod Dilatometer
I.	ASTM G21-13	- Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
J.	ASTM G22-76(96)	- Standard Practice for Determining Resistance of Plastics to Bacteria
K.	ASTM G155-13	- Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials
L.	CSA B45.5-11/ IAPMO Z124-2011	- Plastic Plumbing Fixtures

M.	NFPA 255-06	- Standard Method of Test of Surface Burning Characteristics of Building Materials
N.	NSF/ANSI 51-07	- Food Equipment Materials
O.	SCAQMD Rule 1168	- Adhesive and Sealant Applications (amended January 2005)
P.	UL 723	- Standard for Test for Surface Burning Characteristics of Building Materials
Q.	UL Environment/ GREENGUARD UL 2818	- Standard for Chemical Emissions for Building Materials, - Finishes and Furnishings, Section 7.1
R.	UL Environment/ GREENGUARD UL 2818	- Gold Standard for Chemical Emissions for Building Materials, - Finishes and Furnishings, Section 7.1 and 7.2
S.	UL 2824	- GREENGUARD Certification Program, Method for Measuring Microbial Resistance from Various Sources Using Static Environmental Chambers

1.6 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Arrange preinstallation meeting 1 week prior to commencing work with all parties associated with trade as designated in Contract Documents or as requested by Architect. Presided over by Contractor, include Architect who may attend, Subcontractor performing work of this trade, Owner's representative, testing company's representative and consultants of applicable discipline. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

1.7 SUBMITTALS

A. Product Data: Indicate Product description including solid surface sheets, sinks, bowls and illustrating full range of standard colors, fabrication information and compliance with specified performance requirements. Submit Product data with resistance to list of chemicals.

B. Shop Drawings: Submit Shop Drawings for work of this Section in accordance with Section 01 3000. Indicate plans, sections, dimensions, component sizes, edge details, thermosetting requirements, fabrication details, attachment provisions, sizes of furring, blocking, including concealed blocking and coordination requirements with adjacent work. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in solid surface.

C. Coordination Drawings: Submit coordination drawings indicating plumbing and miscellaneous steel work indicating locations of wall rated or non-rated, blocking requirements, locations and recessed wall items and similar items.

D. Samples: Submit samples in accordance with Section 01 3000. Submit minimum 6" x 6" samples. Cut sample and seam together for representation of inconspicuous seam. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.

E. Test and Evaluation Reports: Submit flammability test reports.

1.8 CLOSEOUT SUBMITTALS

A. Operational and Maintenance Data:

1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in Project closeout documents.

2. Provide a commercial care and maintenance kit and video. Review maintenance procedures and warranty details with Owner upon completion.

1.9 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

B. Mock-Ups:

1. Prior to final approval of Shop Drawings, erect 1 full size mock-up of each component at Project site demonstrating quality of materials and execution for Architect review.

2. Should mock-up not be approved, rework or remake until approval is secured. Remove rejected units from Project site.

3. Approved mock-up will be used as standard for acceptance of subsequent work.

4. Approved mock-ups may remain as part of finished work.

1.10 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver no components to Project site until areas are ready for installation.

B. Storage and Handling Requirements:

1. Store components indoors prior to installation.

2. Handle materials to prevent damage to finished surfaces.

1.11 WARRANTY

A. Manufacturer Warranty: Provide manufacturer's standard warranty for material only for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Architect and at no expense to Owner.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

1. Corian® by DuPont; www.corian.com

2. Trinseo Aristech Surfaces, LLC., Avonite

3. Wilsonart Contract; www.wilsonartcontract.com

B. Substitution Limitations: This Specification is based on Avonite Products. Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification.

2.2 MATERIALS

A. Avonite

1. Color: New Concrete, #7842.

B. Performance/Design Criteria:

Property	Requirement (min or max)	Test Procedure
1. Solid Surface Based Products:		
a. Tensile Strength	6000 psi min	ASTM D638

b.	Tensile Modulus	1.5 x 10^6 psi min		ASTM D638
c.	Tensile Elongation	0.4% min.		ASTM D638
d.	Flexural Strength	10000 psi min		ASTM D790
e.	Flexural Modulus	1.2 x 10^6 psi min		ASTM D790
f.	Hardness	>85-Rockwell "M" scale min.		ASTM D785
g.	Thermal Expansion	2.2 x 10^{-5} in./in./°F		ASTM E228
h.	Fungi and Bacteria	Does not support microbial growth		ASTM G21 & G22
i.	Microbial Resistance	Highly resistant to mold growth		UL 2824
j.	Ball Impact	No fracture - 1/2 lb. Ball: 6 mm slab - 36" drop 12 mm slab - 144" drop		NEMA LD 3, Method 3.8
k.	Weatherability	∆E*94<5 in 1,000 hrs		ASTM G155
l.	Flammability			ASTM E84, NFPA 255 & UL 723
		All Colors		
		6 mm	**12 mm**	
m.	Flame Spread	<25	<25	
n.	Smoke Developed	<25	<25	
o.	Class	A	A	NFPA 101®, Life Safety Code

C. Solid Surface Material:

1. Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment; not coated, laminated or of composite construction; meeting following criteria:

2. Flammability: Class 1 and A when tested to UL 723.

3. Food Equipment Material Compliance: Food Zone to NSF/ANSI 51.

    a. Ensure material has minimum physical and performance properties specified under “Performance/Design Criteria”.

    b. Ensure superficial damage to a depth of 0.010" is repairable by sanding and polishing.

D. Adhesive for Bonding to Other Products: One component silicone to ASTM C920.

E. Sealant: A standard mildew-resistant, FDA/UL® [and NSF/ANSI 51 compliant in Food Zone area,] recognized silicone color matched sealant or clear silicone sealants.

F. Sink/Bowl Mounting Hardware: Manufacturer's approved bowl clips, brass inserts and fasteners for attachment of undermount sinks/bowls.

G. Heat Reflecting Tape: Manufacturer's standard aluminum foil tape, with required thickness, for use with cutouts near heat sources.

H. Insulating Nomex® Fabric: Manufacturer's standard for use with conductive tape in insulating solid surface material from adjacent heat source.

2.3 COMPONENTS

A. Window Sills: 1/2" thick solid surfacing material, adhesively joined with inconspicuous seams, edge details as indicated on Drawings. Color selected later by Architect from manufacturer's full color range.

B. Counter Perimeter Frame: Ensure 1/2" [3/4"] thick, moisture resistant [cores for counter tops in wet areas having sinks or lavatories are 3/4" thick exterior grade plywood with waterproof adhesive, Fir or Poplar plywood, veneer core only.] [MDF core conforming to ANSI/NPA A208.2 balanced design, manufactured from recycled materials, meeting ANSI Standards for emissions, of minimum density of 48 lb/cu ft and surface character to match sample approved by Architect. Ensure fire retardant Product contains fire-retardant chemicals injected with raw materials during manufacturing and achieves a maximum flame-spread rating of 25 with a maximum smoke development of 200 when tested to ASTM E84.]

C. Lavatory Tops with Seamed Bowls: 1/2" [3/4"] thick countertop of [solid polymer] [100% acrylic] [polyester-acrylic blend] solid surfacing material, cast to desired profiles and sizes having edge details as indicated on Drawings conforming to CSA B45.5/IAPMO Z124, complete with [seamed "S" undermount] bowl. Provide countertops complete with backsplashes of size shown on Drawings. Ensure countertop and backsplash is [ ] color; [single color] [maximum 2, 3 or 4 colors] [non-coved] [coved] as selected by Architect. Ensure [5] bowls are [ ] model.

D. Lavatory Tops with Undermount Bowls: 1/2" [3/4"] thick countertop of [solid polymer] [100% acrylic] [polyester-acrylic blend] solid surfacing material, cast to desired profiles and sizes having edge details as indicated on Drawings conforming to CSA B45.5/IAPMO Z124, complete with [1] undermount bowl. Provide countertops complete with backsplashes of size shown on Drawings. Use undermount hardware according to manufacturer's instructions. Ensure vanity top and backsplash is [ ] color; [single color] [maximum 2, 3 or 4 colors] [non-coved] [coved] as selected by Architect. Ensure bowl[s] is/are [ ] model and [ ] color.

E. Lavatory Tops with Integral Bowls: Molded countertop of solid polymer material [19-1/2"] [22"], complete with integrally molded bowl[s] of solid polymer material; edge details as indicated on Drawings. Provide with [non-coved] [coved] backsplash [and endsplashes] as shown on Drawings. Provide [ ] model and [ ] color.

F. Fabrication:

1. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and solid polymer manufacturer requirements. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints. Provide factory cutouts for plumbing fittings and bath accessories as indicated on Drawings.

2. Where indicated, thermoform corners and edges or other objects to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.

3. Ensure no blistering, whitening and cracking of components during forming.

4. Fabricate backsplashes from solid surfacing material with optional radius cove where counter and backsplashes meet as indicated on Drawings. Backsplashes for most colors may be fabricated by traditional means discussed in K-25294 *Backsplashe*s. Colors with metallic/mica particle or veined colors creating directional aesthetics (K-26833 *Directional Aesthetics*) may require the techniques in Technical Bulletin K-28235 *Thermoformed Backsplash*.

5. Fabricate joints between components using manufacturer's standard joint adhesive. Ensure joints are inconspicuous in appearance and without voids. Attach 50 mm (2") wide reinforcing strip of solid polymer material under each joint. Reinforcing strip of solid polymer material is not required when using DuPont™ Joint Adhesive 2.0.

6. Provide holes and cutouts for plumbing and bath accessories as indicated on Drawings.

7. Rout and finish component edges to a smooth, uniform finish. Rout cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.

8. Finish: Ensure surfaces have uniform finish:

    a. Matte, with a 60° gloss rating of 5 - 20.

9. Fabrication Tolerances:

    a. Variation in Component Size: +/-1/8".

    b. Location of Openings: +/-1/8" from indicated location.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

2. Verify actual site dimensions and location of adjacent materials prior to commencing work.

3. Examine cabinets upon which counter tops are to be installed. Verify cabinets are level to within 1/8" in 10' - 0".

4. Notify Architect in writing of any conditions which would be detrimental to installation.

B. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

A. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.

B. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.

C. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer’s written recommendations using adhesive in color to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.

D. Install countertops with no more than 1/8" sag, bow or other variation from a straight line.

E. Adhere undermount/submount/bevel mount sinks/bowls to countertops using manufacturer's recommended adhesive and mounting hardware.

F. Adhere topmount sinks/bowls to countertops using manufacturer recommended adhesives and color-coordinated silicone sealant. [Secure seam mount bowls and sinks to counter tops using color matched joint adhesive.]

G. Seal between wall and components with joint sealant as specified herein and in Section 07 92 00, as applicable.

H. Provide backsplashes and endsplashes as indicated on Drawings. Adhere to countertops using a standard color-coordinated silicone sealant. Adhere applied sidesplashes to countertops using a standard color-matched silicone sealant. Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer’s standard color-coordinated joint adhesive.

I. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Ensure components are clean on date of Substantial Completion of the Work.

J. Coordinate connections of plumbing fixtures with Plumbing and Mechanical. Make plumbing connections to sinks in accordance with Plumbing and Mechanical.

3.3 REPAIR

A. Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer's "Technical Bulletins".

3.4 SITE QUALITY CONTROL

A. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Architect at no cost to Owner.

3.5 CLEANING

A. Remove excess adhesive and sealant from visible surfaces.

B. Clean surfaces in accordance with manufacturer's "Care and Maintenance Instructions".

3.6 PROTECTION

A. Provide protective coverings to prevent physical damage or staining following installation for duration of Project.

B. Protect surfaces from damage until date of Substantial Completion of the Work.

END OF SECTION 06 6116

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section includes but is not limited to the following:

1. Fireproofing for all beams and columns exposed and not enclosed in rated gypsum board walls or masonry.

    a. Type 1 - Light Density Gypsum based cementitious fireproofing for concealed interior beams and columns.

    b. Type 2 - Medium density Portland cement fireproofing for perimeter steel beams and columns.

1.3 SUBMITTALS

A. Product data for each sprayed-on fireproofing product indicated.

B. Certification by manufacturers that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

C. Thickness Schedule Indicating Building Elements to be protected with spray-applied fireproofing; extent of sprayed-on-fireproofing for each different construction and fire-resistance rating including the following:

1. Applicable fire-resistive design designations of inspecting or testing agency acceptable to authorities having jurisdiction.

2. Minimum thickness needed to achieve required fire-resistance ratings of structural components and assemblies.

3. Test reports for sprayed-on-fireproofing from a qualified independent testing agency employed and paid by Contractor or manufacturer.

4. Provide reports indicating that physical Product certificates from fireproofing manufacturers that each sprayed-on fireproofing product indicated for Project complies with specified requirements including those for fire- test-response characteristics and compatibility with adhesives, primers, and other surface coatings on substrates indicated to receive fireproofing.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain sprayed-on fireproofing materials from a single manufacturer for each different product required.

B. Fire Performance Characteristics: Provide materials and construction which are identical to those tested for the following fire performance characteristics, per test method indicated, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. See Drawings for UL System.

C. Contractor shall have successfully completed three (3) projects with specified material.

D. Installer Qualifications: Engage an experienced installer certified, licensed, or otherwise qualified by the sprayed-on fireproofing manufacturer as having the necessary experience, staff, and training to install manufacturer's sprayed-on fireproofing products. Contractor shall have successfully completed (3) projects with the specified materials.

E. Provide fireproofing products containing no detectable asbestos as determined according to the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site in original, unopened packages with manufacturers' labels identifying products legible and intact. Include on labels name of products and manufacturers, date of manufacture and shelf life, where applicable. Also include UL labels for fire-resistance ratings applicable to project.

B. Use materials with limited shelf life within period indicated. Remove from project site and discard any materials whose shelf life has expired.

C. Store materials inside, under cover, above ground and in a manner to keep them dry until ready to use. Remove from project site and discard any materials that have been exposed to moisture or have otherwise deteriorated.

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Do no install sprayed-on fireproofing when ambient or substrate temperatures are 40 deg F (4.4 deg C) and failing, unless temporary protection and heat can be provided to maintain temperatures of both at or above this temperature level for 24 hours before, during and for 24 hours after application of sprayed fireproofing.

B. Ventilation: Ventilate spray fireproofing by means of natural or, when this is inadequate, of forced air circulation during and after application until it dries thoroughly. Maintain minimum of four (4) air exchanges per hour.

1.7 SEQUENCING

A. Sequence and coordinate application of sprayed-on fireproofing with other, related work specified in other sections to comply with the following requirements.

1. Provide temporary enclosures to prevent deterioration of sprayed-on fireproofing for interior applications due to exposure to unfavorable environmental conditions.

2. Avoid unnecessary exposure of sprayed-on fireproofing to abrasion and other damage likely to occur during construction operations subsequent to its application.

3. Whenever possible, do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place. When clips and hangers are installed after the application of the fireproofing material, patch the surrounding exposed steel and totally encapsulate the clip or hanger at a thickness equal to that being applied to the structural member.

4. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until fireproofing is installed.

5. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, tested, and corrections have been made to any defective fireproofing.

6. Protect permanently exposed walls or floors, or special surfaces.

1.8 WARRANTY

A. General: The warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Warranty: Submit a written warranty, executed by Contractor, and cosigned by installer, agreeing to repair or replace sprayed-on fireproofing that has failed within the specified warranty period. Failures include but are not limited to the following:

1. Cracking, flaking, eroding in excess of specified requirements, peeling, and delaminating of sprayed-on fireproofing from substrates due to defective materials and workmanship within the specified warranty period.

2. Not covered under the warranty are failures attributable to damage by occupants and Owner's maintenance personnel, exposure to environmental conditions other than those investigated and approved during fire-response testing, and to other causes not reasonably foreseeable under conditions of normal use.

3. Warranty Period: 2 years from date of Substantial Completion.

PART- 2 PRODUCTS

2.1 TYPE 1 CONCEALED SPRAYED-ON FIREPROOFING MATERIALS

A. General: For concealed applications of sprayed-on fireproofing provide manufacturer's standard products complying with requirements indicated in this article or material composition and physical properties representative of installed products.

B. Cementitious fireproofing consisting of factory-mixed, dry formulation of gypsum or Portland cement binders and lightweight mineral or synthetic aggregates mixed with water at Project site to form a slurry or mortar for conveyance and application.

C. Provide Thickness based on Unrestrained Assemblies and designs.

D. Products containing mineral wool fibers will not be considered for use on this project.

E. Physical Properties: Minimum values, unless otherwise indicated or higher values required to attain designated fire-resistance ratings, measured per standard test methods referenced with each property listed below:

1. Bond Strength: 2001bs. per sq. ft. average 150 lbs. per sq. ft. individual bond strength as determined per ASTM E 736 under the following conditions:

2. Compressive Strength: 1440 psf as determined in the laboratory per ASTM E 761. Minimum sprayed-on fireproofing thickness tested shall be 0.75 inch and the minimum dry density shall be as specified, but not less than 15 pcf.

3. Corrosion Resistance: No evidence of corrosion as determined per ASTM E 937.

4. Deflection: No cracking, spailing, delamination or the like as determined per ASTME 759.

5. Effect of Impact on Bonding: No cracking, spailing, delamination or the like as determined per ASTM E 760.

6. Air Erosion: Maximum weight loss of 0.005 grams per sq, ft, in 24 hours as determined per ASTM E 859. For laboratory tests, the minimum sprayed-on fireproofing thickness is 0.75 inch, the maximum dry density is 15 pcf, test specimens are not pre-purged by mechanically induced air velocities, and tests are terminated after 24 hours.

7. Dry Density: 15 pcf for average and individual densities regardless of density indicated in referenced fire-resistive design, or greater if required to attain fire resistance ratings indicated, as determined per ASTM E 605 or Appendix A.

8. Thickness: Provide minimum average thickness required for fire-resistive deign indicated, but not less than 1/2" for beams and columns, regardless of the thickness required by the given UL design assembly.

9. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84: Flame Spread 0 Smoke Development 0.

10. Resistance to Mold: The fireproofing material shall be formulated at the time of manufacturing with a mold inhibitor. Fireproofing shall be tested per ASTM G21 and shall show resistance to mold growth for a period of 21 days.

F. Products: Subject to compliance with requirements, provide one of the following products only:

G. Monokote Type MK-6, Construction Products Div., W.R. Grace & Co.-Conn. Or similar products meeting the performance requirements of this specification by the Pyrock Company, or Southwest Vermiculite.

2.2 AUXILIARY FIREPROOFING MATERIALS

A. General: Provide auxiliary fireproofing materials that are compatible with sprayed-on fireproofing products and substrates, are approved for use indicated by manufacturer or sprayed-on fireproofing, and are approved by UL or other testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance rated designs indicated.

B. Provide accessories to comply with manufacturer's recommendations and to meet fire resistance design and code requirements. Such accessories include, but are not limited to, any required or optional items such as Spatterkote SK-3; bonding agents, mechanical attachments; application aids such as metal lath, scrim, or netting; and Monokote Accelator.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, to determine if they are in satisfactory condition to receive sprayed-on fireproofing.

B. Do not proceed with installation of fireproofing until satisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances which could impair bond of fireproofing, including oil, grease, rolling compounds, incompatible primers, and loose mill scale.

B. Cover other work which might be damaged by fall-out or over spray of fireproofing materials during application. Provide temporary enclosure as required to confine spraying operations, protect the environment, and to ensure adequate ambient conditions for temperature and ventilation.

C. Prior to application of fireproofing, a bonding agent, approved by fireproofing manufacturer, shall be applied to all concrete substrates to receive MK – 6.

3.3 INSTALLATION, GENERAL

A. General: The application of spray fireproofing shall not commence until the roofing is completely installed and tight, and after roof traffic has ceased.

B. Comply with fireproofing manufacturer's instructions for mixing materials, for application procedures and for types of equipment used to convey and spray-on fireproofing materials, as applicable to the particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Coat substrates with adhesive prior to application of fireproofing where required to achieve fire resistance ratings designated for each condition, unless greater thickness and densities are indicated.

D. Spray textured finish with no further treatment.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: A qualified independent testing agency employed and paid by the Owner will perform field quality-control testing.

B. Extent and Testing Methodology: Owner will provide qualified independent testing facility to test for:

1. Bond Strength: ASTM E 736.

2. Density: ASTM E 605.

3. Thickness: ASTM E 605.

C. Remove and replace fireproofing where test results indicate that it does not comply with specified requirements for cohesion and adhesion or for density or both.

D. Apply additional fireproofing per manufacturer's directions where test results indicate that the thickness does not comply with specified requirements.

3.5 CLEANING, REPAIR, AND PROTECTION

A. Cleaning: Immediately upon completion of spraying operations in each containable area of project, remove over-spray and fall-out of materials from surfaces of other work and clean exposed surfaces to remove evidence of soiling.

B. Cure exposed cementitious fireproofing materials in compliance with fireproofing manufacturer's recommendations to prevent premature drying.

C. Protect fireproofing according to the advice of fireproofing manufacturer and Installer from damage resulting from construction operations or other causes so that fireproofing will be without damage or deterioration at time of substantial completion.

D. Coordinate installation of fireproofing with other work in order to minimize the need for other trades to cut or remove fireproofing. As other trades, successively complete installation of their work, maintain protection of structure afforded by fireproofing by patching any areas which have been removed or damaged prior to concealment of fireproofing by other work.

E. Repair or replace work which has not been successfully protected.

F. Floors shall be left in broom clean finish.

END OF SECTION 07 2500

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes:

B. Fully adhered thermoplastic polyolefin (TPO) sheet roofing system, including roofing insulation and protection board, where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

C. Removal of existing roof system in areas indicated to receive new roofing system and in other areas as required to complete the work.

D. Vapor retarder

E. Wood nailers for roofing attachment

F. Roof insulation

G. Flashings

H. Manufacturer's pre-construction and final inspection as specified herein. These inspections are to be included; additional inspections, or work incurred as a result of the final inspection shall be without additional cost to the Owner.

I. Related Requirements:

J. Division 06 Section "Miscellaneous Rough Carpentry": Furnishing and installing wood blocking.

K. Division 23 Mechanical Specifications.

L. Disposal of demolition debris and construction waste is the responsibility of Contractor. Perform disposal in manner complying with all applicable federal, state, and local regulations.

M. Comply with the published recommendations and instructions of the roofing membrane Manufacturer.

N. Commencement of work by the Contractor shall constitute acknowledgement by the Contractor that this specification can be satisfactorily executed, under the project conditions and with all necessary prerequisites for warranty acceptance by roofing membrane Manufacturer.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in the current editions of ASTM D1079 and NRCA's “The NRCA Roofing Manual: Membrane Roof Systems” apply to work of this Section.

1.4 QUALITY ASSURANCE

A. The manufacturer’s authorized technical representative shall provide a final inspection at the completion of the project to insure, that the project has been completed in accordance with the manufacturer’s requirements. Upon approval and acceptance of the project, furnish to Owner, implemented manufacturer's warranty certification.

B. Submit Manufacturer’s field quality control reports of field inspections, including, revised “as-built” shop drawings and manufacturer’s final punch list.

C. All roofing shall be as described in this Section and shall be provided and approved by the roof system manufacturer. Any materials not manufactured or provided by manufacturer shall have written approval from the manufacturer stating the materials are acceptable and are compatible with the other materials and systems required.

D. UL Listing: Provide labeled materials which have been tested and listed by UL in "Building Materials Directory" for application indicated, with "Class A" rated materials/system for roof slopes shown.

E. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

F. The roof system manufacturer’s Technical Specifications shall be considered a part of this specification and should be used as a reference for specific application procedures and recommendations. Where a conflict does exist between the manufacturer’s written specifications and those procedures specified in this Section, the more stringent requirements meeting the Manufacturer’s minimum requirements for the provided warranty shall apply.

1.5 SUBMITTALS

A. Product Data

B. Provide membrane Manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane Manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.

C. Where UL or FM requirements are specified, provide documentation that shows that the roofing system to be installed is UL-Classified or FM-approved, as applicable. Include data itemizing the components of the classified or approved system.

D. Installation Instructions

E. Provide Manufacturer's instructions to Installer, marked up to show exactly how all components will be installed.

F. Where instructions allow installation options, clearly indicate which option will be used.

G. Shop Drawings

H. Provide roof plan indicating orientation of steel deck (if applicable), and fastener and/or adhesive layouts.

I. Provide the roof membrane Manufacturer's standard details customized for this project for all relevant conditions, including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.

J. Provide copy of Pre-Installation Notice to show that Manufacturer's required Pre-Installation Notice (PIN) has been accepted and approved by the Manufacturer.

K. Submit samples of each product to be used. (optional)

L. Specimen Warranty

M. Closeout Submittals

N. Executed Warranty

O. Maintenance data

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in Manufacturer's original containers, dry and undamaged, with seals and labels intact and legible. Label with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Discard and legally dispose of material that cannot be applied within its stated shelf life.

C. Store materials clear of ground and moisture with weather protective covering.

D. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

E. Keep combustible materials away from ignition sources.

F. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck and/or structural overloading.

G. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

1.7 FIELD CONDITIONS

A. Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with Manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

A. Provide Elevate 20-year Red Shield™ Roofing System Limited Warranty covering membrane, roof insulation, and system accessories. Comply with all warranty procedures required by Manufacturer, including notifications, scheduling, and inspections.

B. Limit of Liability: No dollar limitation (NDL).

C. Scope of Coverage: Repair leaks in the roofing system caused by

D. Ordinary wear and tear

E. Normal exposure to the elements

F. Manufacturing defect in Elevate materials

G. Defective workmanship used to install these materials

H. Damage due to winds up to 80mph

I. Not Covered:

J. Damage due to winds in excess of 80mph

K. Damage due to hurricanes or tornadoes

L. Hail

M. Intentional damage

N. Unintentional damage due to normal rooftop inspections, maintenance, or service

PART- 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Firestone Building Products; ULTRAPLY TPO XR Adhered Membrane or a comparable product by one of the following:

B. Firestone Building products.

C. Carlisle SynTec Incorporated.

D. Versico Inc.

E. Source Limitations: Obtain components including roof insulation fasteners and accessories for roofing system from same manufacturer as membrane roofing manufacturer approved by membrane roofing manufacturer.

F. Substitution requests shall be considered in accordance with contract provisions and the performance requirements outlined in this document.

2.2 ROOFING SYSTEM DESCRIPTION

A. Roofing System

B. Membrane: Thermoplastic polyolefin (TPO)

C. Thickness: As specified elsewhere

D. Membrane Attachment: Adhered

E. Slope: ¼:12 (2%) by means of tapered insulation or along with structural slope if present.

F. Comply with applicable local building code requirements.

G. Provide assembly having Underwriters Laboratories, Inc. (UL) Class A Fire Hazard Classification

H. Provide assembly complying with Factory Mutual Corporation (FM) Roof Assembly Classification, FM Data Sheets 1-28 and 1-29, and meeting minimum requirements of FM 1-90 wind uplift rating.

I. Vapor Barrier over deck/deck cover:

J. Membrane: High density polyethylene sheet with SBS modified bitumen adhesive

K. Attachment: Self-adhering

L. Insulation (composite):

M. Total System R-Value: 48 or greater

N. Maximum Board Thickness: 4"

O. Use as many layers as necessary to achieve required R-value

P. Stagger joints in adjacent layers

Q. Base Layer: Polyisocyanurate foam board, non-composite

R. Attachment: Low-rise polyurethane adhesive

S. Top Layer: Polyisocyanurate foam board, composite

T. Attachment: Low-rise polyurethane adhesive

U. TPO Membrane Materials

V. Roofing and Flashing Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D 6878, with polyester weft inserted reinforcement and the following additional characteristics:

W. Thickness: 0.080" (match existing)

X. Color: White (match existing)

Y. Reinforcement: Polyester, weft-inserted scrim

Z. Sheet Width: Use widest sheet practical for jobsite conditions to minimize field seams

AA. Acceptable Product: UltraPly™ TPO Membrane by Elevate

BB. Membrane Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane Manufacturer.

CC. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18" (457 mm) wide; UltraPly™ TPO 18" Curb Flashing.

DD. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber, color to match roof membrane; UltraPly™ TPO Unsupported Flashing by Elevate.

EE. Factory-formed Weldable Flashing Accessories: UltraPly™ TPO Flashing (various) by Elevate.

FF. Self-Adhering Flashing Membrane: Unsupported (non-reinforced) TPO membrane factory laminated to white seam tape; UltraPly™ TPO QuickSeam™ Flashing by Elevate.

GG. Factory-formed Self-Adhering Flashing Accessories: UltraPly™ TPO QuickSeam™ Flashing (various) by Elevate.

HH. Bonding Adhesive: Formulated for compatibility with TPO membrane and wide variety of substrate materials; UltraPly™ Bonding Adhesive by Elevate.

II. Seam Edge Treatment: Clear polymer-based sealant, formulated for sealing exposed edges of membrane; UltraPly™ TPO Cut Edge Sealant by Elevate.

JJ. Pourable Sealer: One part polyurethane; White One-Part Pourable Sealer by Elevate.

KK. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal S-20 by Elevate

LL. Metal Plates and Strips used for Fastening Membrane and Insulation: Steel with Galvalume coating; corrosion-resistance meeting FM 4470 criteria

MM. Coated Metal Plates for Induction Welding (if applicable): UltraPly™ TPO InvisiWeld™ Plate by Elevate.

NN. Termination Bars: Aluminum bars with integral caulk ledge; 1.3" (33 mm) wide by 0.10" (2.5 mm) thick; Termination Bar by Elevate

OO. Roof Walkway Pads: TPO pad designed to provide protection from essential rooftop services and traffic and maintain the integrity of the existing roof surface; UltraPly™ TPO Walkway Pad by Elevate.

PP. Yellow Safety Strip: A 5.5" (140 mm) by 100' long (30 m) strip and nominal 30 mil (0.76 mm) thick yellow TPO membrane laminated to a white, cured, seam tape, compatible with TPO and EPDM; QuickSeam™ Yellow Safety Strip by Elevate.

QQ. Roof Insulation and Cover Boards

RR. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with glass reinforced mat laminated to facers, complying with ASTM C 1289 Type II Class 1, with the following additional characteristics:

SS. Thickness: As indicated elsewhere

TT. Size: 48" by 48" nominal

UU. R-Value (LTTR) per inch (25 mm): min. 6.2R at 40 °F (4.4 °C) and min. 5.7R at 75 °F (23.9 °C)

VV. Compressive Strength: 20 psi (138 kPa)

WW. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents

XX. Acceptable Product: ISOGARD GL polyiso board insulation by Elevate.

YY. Composite Insulation: closed cell polyiso foam core laminated to ½" (13 mm) high density ISOGARD HD board:

ZZ. Thickness: As indicated elsewhere

AAA. Size: 48" by 48" nominal

BBB. Compressive Strength: 20 psi (138 kPa) core with 80 psi (552 kPa) board

CCC. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents

DDD. Acceptable Product: ISOGARD™ HD Composite by Elevate

EEE. Insulation Fasteners: Type and size as required by roof membrane Manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane Manufacturer.

FFF. Low Rise Foam Adhesive: Two-component, low-rise polyurethane adhesive designed to attach polyisocyanurate insulation to a variety of acceptable substrates; Twin Jet or I.S.O.Stick™ or I.S.O. Twin Pack™ or I.S.O.Spray™ R by Elevate

GGG. Vapor Barrier

HHH. Vapor Barrier Membrane: Comprised of SBS modified bitumen adhesive, factory-laminated to a tri-laminate woven, high-density polyethylene top surface. Release liner protecting adhesive. May be used as a temporary roof membrane for up to ninety (90) days.

III. Thickness: 0.0325" (0.826 mm) minimum, when tested in accordance with ASTM D 5147

JJJ. Max Load at Break at 73 °F (23 °C): 64 lbf/in, MD (11 kN/m) 88 lbf/in, XMD (15 kN/m) when tested in accordance with ASTM D 5147

KKK. Low Temperature Flexibility: -30 °F (-34 °C) when tested in accordance with ASTM D 5147

LLL. Moisture Vapor Permeance, 0.02 Perms (0.92 Ng/Pa•s•m2) maximum, when tested in accordance with ASTM E 96

MMM. Air Permeability: 0.00114 ft3/min•ft2 (0.007 L/sec•m2) maximum, when tested in accordance with ASTM E 2178

NNN. Acceptable Product: V-Force Vapor Barrier Membrane by Elevate.

OOO. Metal Accessories

PPP. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer

QQQ. Wind Performance:

RRR. Membrane Pull-Off Resistance: 100 lbs./ft (1460 N/m), minimum, when tested in accordance with ANSI/SPRI ES-1 Test Method RE-1, current edition

SSS. Fascia Pull-Off Resistance: At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-2, current edition

TTT. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-270 rating

UUU. Description: Two-piece, 45° sloped galvanized steel sheet edge member securing top and bottom edges of formed metal fascia

VVV. Fascia Face Height: 5" (127 mm)

WWW. Edge Member Height Above Nailer: 1 ¼" (31 mm)

XXX. Fascia Material and Finish: 24-gage, 0.024" (0.06 mm) galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film

YYY. Length: minimum of 120" (3.048 m)

ZZZ. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia

AAAA. Acceptable Product: Appropriate Elevate pre-manufactured fascia system

BBBB. Weldable Metal: Flexible non-reinforced thermoplastic polyolefin membrane factory laminated to hot-dipped galvanized steel, color to match roof membrane; UltraPly™ TPO Coated Metal

CCCC. Aluminum Bar: Continuous 6063-T6 alloy aluminum extrusion with pre-punched slotted holes; miters welded; injection molded EPDM splices to allow thermal expansion

DDDD. Anchor Bar Cleat: 20-gage, 0.036" (0.9 mm) G90 coated commercial type galvanized steel with pre-punched holes

EEEE. Curved Applications: Factory modified

FFFF. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted

GGGG. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, scuppers, and end caps; minimum 14" (355 mm) long legs on corner pieces

HHHH. Scuppers: Welded watertight

IIII. Accessories: Provide matching brick wall cap, downspout, extenders, and other special fabrications as shown on the drawings

JJJJ. Parapet Copings: Formed metal coping with galvanized steel anchor/support cleats for capping any parapet wall; watertight, maintenance free, without exposed fasteners; butt type joints with concealed splice plates; mechanically fastened as indicated

KKKK. Wind Performance:

LLLL. At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.

MMMM. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

NNNN. Description: Coping sections allowed to expand and contract freely while locked in place on anchor cleats by mechanical pressure from hardened stainless steel springs factory attached to anchor cleats; 8" (200 mm) wide splice plates with factory applied dual non-Curing sealant strips capable of providing watertight seal.

OOOO. Material and Finish: 24-gage, 0.024" (0.06 mm) thick galvanized steel with Kynar 500 finish in Manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.

PPPP. Dimensions:

QQQQ. Wall Width: As indicated on the drawings.

RRRR. Piece Length: Minimum 144" (3.65 m).

SSSS. Curved Application: Factory fabricated in true radius.

TTTT. Anchor/Support Cleats: 20-gage, 0.036" (0.9 mm) thick pre-punched galvanized cleat with 12" (305 mm) wide stainless-steel spring mechanically locked to cleat at 72" (1.82 m) on center.

UUUU. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters, corners, intersections, curves, pier caps, and end caps; minimum 14" (355 mm) long legs on corner, intersection, and end pieces.

VVVV. Fasteners: Factory-furnished; electrolytically compatible; minimum pull out resistance of 240 lbs. (109 kg) for actual substrate used; no exposed fasteners.

WWWW. Acceptable Product: Appropriate Elevate pre-manufactured coping system

XXXX. Accessory Materials

YYYY. Wood Nailers: PS 20-dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.

ZZZZ. Width: as noted on drawings, nominal minimum, or as wide as the nailing flange of the roof accessory to be attached to it

AAAAA. Thickness: Same as thickness of roof insulation

PART- 3 EXECUTION

3.1 GENERAL

A. Install roofing, insulation, flashings, and accessories in accordance with roofing Manufacturer's published instructions and recommendations for the specified roofing system. Where Manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.

B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.

C. Do not start work until Pre-Installation Notice has been approved by Manufacturer as confirmation that this project qualifies for a Manufacturer's warranty.

D. Perform work using competent and properly equipped personnel.

E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the Applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

F. Install roofing membrane only when surfaces are clean, dry, smooth, and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult Manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 °F (15 to 25 °C).

G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.

H. Protect from spills and overspray from bitumen, adhesives, sealants, and coatings.

I. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.

J. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

K. Until ready for use, keep materials in their original containers as labeled by the Manufacturer.

L. Consult membrane Manufacturer's instructions, container labels, and Safety Data Sheets (SDS) for specific safety instructions. Keep all adhesives, sealants, primers, and cleaning materials away from all sources of ignition.

3.2 EXAMINATION

A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment, and that deflection will not strain or rupture roof components or deform deck.

B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.

C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

D. Examine roof substrate to verify that it is properly sloped to drains.

E. Verify that the specifications and drawing details are workable and not in conflict with the roofing Manufacturer's recommendations and instructions; start of work constitutes acceptance of project conditions and requirements

3.3 PREPARATION

A. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease, and other materials that may damage the membrane.

B. Fill all surface voids in the immediate substrate that are greater than 1/4" (6 mm) wide with fill material acceptable to membrane Manufacturer.

C. Seal, grout, or tape deck joints, where needed, to prevent seepage into building.

3.4 VAPOR BARRIER INSTALLATION

A. All substrates (except metal decks) must be primed prior to application. Use only primer supplied by membrane Manufacturer.

B. Expanded Polystyrene, Extruded Polystyrene, Common Polyisocyanurate, Fiberglass, Wood Fiber, Perlite, and existing single-ply roofs are not acceptable substrates for SBS bitumen adhesive.

C. Application can be made at ambient temperatures as low as 25 °F (-4 °C) as long as membrane has been stored in a heated area so that it will be between 50 °F (10 °C) and 100 °F (38 °C) at the time of application.

D. Install with minimum 3" (76.2 mm) side laps and 6" (152.4 mm) end laps.

E. Roll in with a 75 lb. (34 kg) roller to fully mate each roll to substrate, including all lap areas

3.5 INSULATION AND COVER BOARD INSTALLATION

A. Install insulation in configuration and with attachment method(s) specified in PART 2, under Insulation.

B. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.

C. Lay roof insulation in courses parallel to roof edges.

D. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than ¼" (6 mm). Fill gaps greater than ¼" (6 mm) with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than ¼" (6 mm).

E. Mechanical Fastening: Using specified fasteners and insulation plates engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for specified FM Class and membrane Manufacturer, whichever is more stringent.

F. Adhesive Attachment: Apply in accordance with membrane Manufacturer's instructions and recommendations; "walk-in" individual roof insulation boards to obtain maximum adhesive contact.

3.6 SINGLE-PLY MEMBRANE INSTALLATION

A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.

B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.

C. Install membrane without wrinkles and without gaps or fishmouths in seams, and bond and test seams and laps in accordance with membrane Manufacturer's instructions and details.

D. Adhered Membrane: Bond membrane sheet to substrate using membrane Manufacturer's recommended bonding material, application rate, and procedures.

E. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 1:12 inches (8.3%) using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing Manufacturer. Exceptions: Round pipe penetrations less than 18" (460 mm) in diameter and square penetrations less than 4" (200 mm) square.

    1. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing Manufacturer and compliant with IBC.

3.7 FLASHING AND ACCESSORIES INSTALLATION

A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane Manufacturer's recommendations and details.

B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.

    1. Follow roofing Manufacturer's instructions.

    2. Use weldable TPO-coated metal where membrane-to-metal connections occur.

    3. Remove protective plastic surface film immediately before installation.

    4. Install water block sealant under the membrane anchorage leg.

    5. Flash with Manufacturer's recommended flashing sheet unless otherwise indicated.

    6. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.

    7. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.

    8. When the roof slope is greater than 1:12 (8.3%), apply seam edge treatment along the back edge of the flashing.

C. Scuppers: Set TPO-coated metal scuppers in sealant and weld to membrane as recommended by Manufacturer.

D. Roofing Expansion Joints: Install as shown on drawings and as recommended by roofing Manufacturer.

E. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces:

1. Install weathertight flashing at all walls, curbs, parapets, skylights, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8" (200 mm) above membrane surface.

2. Use the longest practical flashing pieces.

3. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane Manufacturer's recommendations.

4. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.

5. Provide termination directly to the vertical substrate as shown on roof drawings.

F. Roof Drains:

1. Taper insulation around drain to provide smooth transition from roof surface to drain. Use specified pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope; slope not to exceed Manufacturer's recommendations.

2. Position membrane, then cut a hole for roof drain to allow ½" to ¾" (12 to 19 mm) of membrane to extend inside clamping ring past drain bolts.

3. Make round holes in membrane to align with clamping bolts; do not cut membrane back to bolt holes.

4. Apply sealant on top of drain bowl where clamping ring seats below the membrane

5. Install roof drain clamping ring and clamping bolts; tighten clamping bolts to achieve constant compression.

G. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.

H. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings wherever practical; otherwise use specified self-curing elastomeric flashing.

I. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2" (50 mm) deep, with at least 1" (25 mm) clearance from penetration, sloped to shed water.

J. Structural Steel Tubing: If corner radii are greater than ¼" (6 mm) and longest side of tube does not exceed 12" (305 mm), flash as for pipes; otherwise, provide a standard curb with flashing.

K. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by Manufacturer.

3.8 WALKWAY INSTALLATION

A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and where indicated on the drawings.

1. Use specified walkway pads unless otherwise indicated.

2. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1" (25 mm) and maximum of 3" (75 mm) from each other to allow for drainage.

3. If installation of walkway pads over field fabricated splices or within 6" (150 mm) of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6" (150 mm) on either side.

4. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.9 FIELD QUALITY CONTROL

A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system Manufacturer specifically to inspect installation for warranty purposes (e.g., not a sales representative).

B. Perform all corrections necessary for issuance of warranty.

3.10 CLEANING

A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.

B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of Manufacturers of components and surfaces.

C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.11 PROTECTION

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Where construction traffic must continue over finished roof membrane, provide durable protection, and replace or repair damaged roofing to original condition.

C. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 5423

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and detail to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested firestop systems shall be used in specific locations as follows:

1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

2. Blank openings through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

3. Openings and penetrations in fire-rated partitions or walls containing fire doors.

4. Openings around structural members which penetrate floors or walls.

1.4 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

1. Section 03 3000 - Cast-In-Place Concrete

2. Section 07 8443 - Joint Firestopping

3. Section 07 9000 - Sealants

4. Section 09 2500 - Gypsum Drywall

5. Section 21 0000 - Fire Suppression

6. Section 22 0000 - Plumbing

7. Section 23 0000 - Heating, Ventilating, and Air Conditioning

8. Section 26 0000 - Electrical

9. Section 27 0000 - Communications

1.5 REFERENCES

A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops"

B. Test Requirements: UL 1479, “Fire Tests of Through-Penetration Firestops”

C. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

1. UL Fire Resistance Directory:

a. Firestop Devices (XHJI)

b. Fire Resistance Ratings (BXRH)

c. Through-Penetration Firestop Systems (XHEZ)

d. Fill, Voids, or Cavity Material (XHHW)

e. Forming Materials (XHKU)

D. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

E. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.

F. Inspection Requirements: ASTM E 2174, “Standard Practice for On-site Inspection of Installed Fire Stops.”

G. All major building codes: ICBO, SBCCI, BOCA, IBC

H. NFPA 101 - Life Safety Code

I. NFPA 70 - National Electric Code

1.6 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide through-penetration fire stop systems that comply with specified requirements of tested systems.

B. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment documents must follow requirements set forth by the International Firestop Council.

1.7 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified firestop systems to be used and manufacturer's installation instructions to comply with Section 01 6000 Submittals.

B. Manufacturer's engineering judgment identification number and drawing details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.

C. Submit safety data sheets provided with product delivered to job-site.

1.8 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

B. The work is to be installed by a contractor with at least one of the following qualifications:

1. FM 4991 Approved Contractor

2. UL Approved Contractor

3. Hilti Accredited Fire Stop Specialty Contractor

C. Firm with not less than 3 years experience with fire stop installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type and UL label where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART- 2 PRODUCTS

2.1 FIRESTOPPING - GENERAL

A. Provide firestopping composed of components that are 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.

B. Provide components for each firestopping system that are 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.

C. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.

D. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

2. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

3. W-Rating: Class 1 rating in accordance with water leakage test per UL 1479.

E. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.

F. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of zero (0) as determined by ASTM G21.

G. Firestopping Materials are either “cast-in-place” (integral with concrete placement) or “post installed.” Provide cast-in-place firestop devices prior to concrete placement.

2.2 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturer as identified below:

1. Basis of Design:

a. Hilti, Inc., Plano, Texas
800-879-8000
www.us.hilti.com

2. Substitution requests shall be considered in accordance with contract provisions and the performance requirements outlined in this document.

2.3 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Pre-formed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors the following products are acceptable:

1. Hilti Cast-In Place Firestop Device (CP 680-P)

    a. Add Aerator Adaptor when used in conjunction with aerator system.

2. Hilti Cast-In Place Firestop Device (CP 680-M) for use with noncombustible penetrants.

3. Hilti Cast-in Place Firestop System for Metal Decks (CFS CID MD P) including all components as described by manufacturer for proper installation.

4. Hilti Cast-in Place Firestop System for Metal Decks (CFS CID MD M) including all components as described by manufacturer for proper installation, for use with noncombustible penetrants.

5. Hilti Tub Box Kit (CP 681) for use with tub installations.

6. Hilti Firestop Speed Sleeve (CP 653) for use with cable penetrations.

7. Hilti Firestop Drop-In Device (CFS-DID) for use with noncombustible and combustible penetrants.

8. Hilti Firestop Block (CFS-BL)

9. Hilti Closet Stub (CFS-CID CS)

C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Hilti Intumescent Firestop Sealant (FS-ONE MAX)

2. Hilti Fire Foam (CP 620)

3. Hilti Flexible Firestop Sealant (CP 606)

4. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

5. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

1. Hilti Silicone Sealant Gun Grade (CFS-S SIL GG)

2. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

3. Hilti Flexible Firestop Sealant (CP 606)

4. Hilti Intumescent Firestop Sealant (FS-ONE MAX)

E. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

1. Hilti Intumescent Firestop Sealant (FS-ONE MAX)

F. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti Intumescent Firestop Sealant (FS-ONE MAX)

2. Hilti Fire Foam (CP 620)

3. Hilti Flexible Firestop Sealant (CP 606)

4. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

5. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

G. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti Firestop Putty Stick (CP 618)

2. Hilti Firestop Plug (CFS-PL)

H. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

1. Hilti Firestop Putty Pad (CFS-P PA)

2. Hilti Firestop Putty Pad (CP 617)

3. Hilti Firestop Box Insert

I. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti Firestop Collar (CP 643N)

2. Hilti Firestop Collar (CP 644)

3. Hilti Wrap Strips (CP 648-E/648-S)

J. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti Firestop Block (CFS-BL)

2. Hilti Composite Sheet (CFS-COS)

3. Hilti Firestop Mortar (CP 637)

4. Hilti Fire Foam (CP 620)

5. Hilti Firestop Board (CP 675T)

K. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti Firestop Block (CFS-BL)

2. Hilti Firestop Board (CP 675T)

L. Re-penetrable, round cable management devices for use with new or existing cable bundles penetrating gypsum or masonry walls, the following products are acceptable:

1. Hilti Firestop Speed Sleeve (CP 653) with integrated smoke seal fabric membrane.

2. Hilti Firestop Cable Collar (CFS-CC)

3. Hilti Firestop Sleeve (CFS-SL SK)

4. Hilti Retrofit Sleeve (CFS-SL RK) for use with existing cable bundles.

5. Hilti Gangplate (CFS-SL GP) for use with multiple cable management devices.

6. Hilti Gangplate Cap (CFS-SL GP CAP) for use at blank openings in gangplate for future penetrations.

M. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits or cables is expected, the following products are acceptable:

1. 1. Hilti Firestop Block (CFS-BL)

2. 2. Hilti Firestop Plug (CFS-PL)

N. For single or cable bundles up to one inch diameter penetrating gypsum, masonry, concrete walls or wood floor assemblies the following product is acceptable:

1. Hilti Firestop Cable Disc (CFS-D)

PART- 3 EXECUTION

3.1 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify penetrations are properly sized and in suitable condition for application of materials.

2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 COORDINATION

A. Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

C. Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.

D. Do not cover up through-penetration fire stop and joint system installations that will become concealed behind other construction until each installation has been examined by the building inspector, per requirements of Section 109, International Building Code 2000, ed.

3.3 INSTALLATION

A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration materials.

1. Seal all holes or voids made by penetrations to ensure an air and water-resistant seal.

2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

3. Protect materials from damage on surfaces subjected to traffic.

3.4 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.

D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

E. Manufacturer's Field Services: Contractor to ensure a manufacturer's direct representative is on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. Training will be done per manufacturer's written recommendations published in their literature and drawing details. During installation, contractor shall have manufacturer's representative provide periodic visual observations and written documentation of the results. Contact Hilti for support at 800.879.8000.

3.5 IDENTIFICATION & DOCUMENTATION

A. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.

1. The Documentation Form for through penetrations is to include:

a. A Sequential Location Number

b. The Project Name

c. Date of Installation

d. Detailed Description of the Penetration's Location

e. Tested System or Engineered Judgment Number

f. Type of Assembly Penetrated

g. A Detailed Description of the Size and Type of Penetrating Item

h. Size of Opening

i. Number of Sides of Assemblies Addressed

j. Hourly Rating to be achieved.

k. Installer's Name

B. Copies of these documents are to be provided to the general contractor at the completion of the project.

C. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:

1. The words: "Warning: Through Penetration Firestop System – Do Not Disturb. Notify Building Management of Any Damage."

2. Contractor's name, address and phone number.

3. Through-penetration firestop system designation of applicable testing and inspecting agency.

4. Date of installation.

5. Through-penetration firestop system manufacturer's name.

6. Installer's name.

D. A firestop documentation manager software shall be used to document, track, and maintain the passive firestop systems throughout the construction and maintenance phase of the facility. The software solution shall be used to track and document every firestop system installed on the project and each subsequent addition, change, or removal of the firestop system. The firestop documentation shall be managed with a cloud-based software which allows the installer to use a standard smartphone or tablet device (either iOS, Android or Windows capable) to capture the relevant information for the installation. The following data shall be tracked for each penetration within the facility: product installed, system installed, date of installation, location of the penetration including a notation on the 2D plan image, F-rating, name of installer, photo (pre-installation and post-installation), and inspection status. The Owner and/ or Construction Manager may designate additional items to be tracked. The firestop documentation manager software must perform the following basic functions:

1. Create multiple projects/ facilities, add/create/ remove users for each project, upload documents including UL systems, 2D floor plans, product data, engineering judgments, etc.

2. Define data to track using pre-defined input fields or creating custom input fields as desired.

3. Capture multiple photos for each penetration, including a pre-installation and post-installation photo.

4. Scan QR Code on Hilti identification label to link the program data to a specific penetration location.

5. Annotate (mark) location of penetration on 2D floor plan.

6. Create reports by filtering data and utilizing report templates.

7. Online/ offline (for use in areas where data service is unavailable) synchronization of data between mobile device, online application and cloud-based system.

8. Ability to transfer ownership of projects from one customer to another from construction phase to facility maintenance.

E. Permanently attach Hilti identification labels to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove or change penetrating items or firestopping. Labels shall have a unique QR code for each penetration which can be scanned by the firestop documentation software to quickly identify the penetration attributes.

F. Acceptable Software: Hilti CFS-DM, from Hilti Inc., Tulsa, OK. Tel (800) 879-8000 or Hilti (Canada) Corporation, Mississauga, Ontario (800) 363-4458 website: www.us.hilti.com or www.hilti.ca.com

1. Single Source: Obtain firestop documentation manager software and firestop systems for each type of penetration and construction condition indicated only from a single manufacturer.

3.6 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

3.7 LABOR USE TO INSTALL FIRESTOP SYSTEMS

A. To ensure complete harmony on the project site, the installation of each scope of work is to be performed jurisdictionally correct per existing trade agreements.

3.8 SCHEDULE OF THROUGH PENETRATION FIRESTOP SYSTEMS

CONCRETE FLOORS			CONCRETE OR BLOCK WALLS		
TYPE OF PENETRANT	**F-RATING (HR)**	**BASIS OF DESIGN UL SYSTEM**	**TYPE OF PENETRANT**	**F-RATING (HR)**	**BASIS OF DESIGN UL SYSTEM**
CIRCULAR BLANK OPENINGS	1	F-A-0006, C-AJ-0055, C-AJ-0090	CIRCULAR BLANK OPENINGS	1	C-AJ-0055, C-AJ-0090
	2	F-A-0006, C-AJ-0055, C-AJ-0090		2	C-AJ-0055, C-AJ-0090
	3	F-A-0006, C-AJ-0055, C-AJ-0086,		3	C-AJ-0055, C-AJ-0086
SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, F-A-1028, F-A-1017	SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, W-J-1067, W-J-1020
	2	C-AJ-1226, F-A-1028, F-A-1017		2	C-AJ-1226, W-J-1067, W-J-1020, W-J-1248
	3	C-AJ-1226, F-A-1017		3	C-AJ-1226, W-J-1041, W-J-1068
	4	C-BJ -1037, C-BJ-1034		4	C-BJ-1034, C-BJ-1037, W-J-1041, W-J-1042, W-J-1068
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	F-A-2053, F-A-2025, C-AJ-2109, C-AJ-2098, C-AJ-2271, C-AJ-2167,	SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	C-AJ-2109, C-AJ-2098, C-AJ-2167, C-AJ-2371, C-AJ-2342
	2	C-AJ-2098, C-AJ-2271, C-AJ-2167, C-BJ-2021, C-AJ-2371, C-AJ-2342		2	C-AJ-2109, C-AJ-2098, C-AJ-2167, C-AJ-2371, C-AJ-2342
	3	F-A-2054, C-AJ-2109, C-AJ-2098, C-AJ-2371, C-AJ-2342		3	C-AJ-2109, C-AJ-2098, C-AJ-2371, C-AJ-2342
	4	C-BJ 2016, C-AJ-2017		4	W-J-2057, W-J-2091
SINGLE/CABLE BUNDLES	1	F-A-3007,C-AJ-3095,C-AJ-3180, C-AJ-3283	SINGLE/CABLE BUNDLES	1	W-J-3036, C-AJ-3095, C-AJ-3180, W-J-3060, W-J-3167
	2	F-A-3007,C-AJ-3095,C-AJ-3334, F-A-3060		2	W-J-3036, C-AJ-3095, C-AJ-3180, W-J-3060, W-J-3167, W-J-3189
	3	F-A-3007, C-AJ 3095, C-AJ-3285		3	C-AJ-3095, C-AJ-3180, W-J-3167
				4	W-J-3050
CABLE TRAY	1	C-AJ-4034, C-AJ-4035	CABLE TRAY	1	W-J-4027, C-AJ-4034, C-AJ-4035
	2	C-AJ-4034, C-AJ-4035		2	W-J-4027, C-AJ-4034, C-AJ-4035
	3	C-AJ-4034, C-AJ-4035		3	C-AJ-4034, C-AJ-4035
				4	W-J-8007
SINGLE INSULATED PIPES	1	F-A 5015, F-A 5017, C-AJ-5090, C-AJ-5091, C-AJ-5090, C-AJ-5048	SINGLE INSULATED PIPES	1	C-AJ-5090, C-AJ-5091, C-AJ 5061, W-J-5042
	2	F-A 5015, F-A 5017, C-AJ-5090, C-AJ-5091, C-AJ-5090		2	C-AJ-5090, C-AJ-5091, C-AJ-5061, W-J-5042

	3	F-A 5016, C-AJ-5090, F-A-5018		3	C-AJ-5090, C-AJ-5061
	4	C-BJ-5006		4	C-BJ-5006, W-J-5028
ELECTRICAL BUSWAY	1	C-AJ-6006, C-AJ-6017, F-A-6002, C-AJ-6036	ELECTRICAL BUSWAY	1	C-AJ-6006, C-AJ-6017, C-AJ-6036
	2	C-AJ-6006, C-AJ-6017, F-A 6042, C-AJ-6036		2	C-AJ-6006, C-AJ-6017, C-AJ-6036
	3	C-AJ-6006, C-AJ-6017		3	C-AJ-6006, C-AJ-6017
MECHANICAL DUCTWORK WITHOUT DAMPERS NON-INSULATED	1	C-AJ-7046, C-AJ-7051, C-AJ-7084	MECHANICAL DUCTWORK WITHOUT DAMPERS NON-INSULATED	1	C-AJ-7046, C-AJ-7051, W-J-7021, W-J-7022
	2	C-AJ-7046, C-AJ-7051, C-AJ-7085		2	C-AJ-7046, C-AJ-7051, W-J-7021, W-J-7022
	3	C-AJ-7046, C-AJ-7051		3	C-AJ-7046, C-AJ-7051
MECHANICAL DUCTWORK WITHOUT DAMPERS INSULATED	N/A**	N/A**	MECHANICAL DUCTWORK WITHOUT DAMPERS INSULATED	1	W-J-7029, W-J-7124
				2	W-J-7091, W-J-7112, W-J-7124
MIXED PENETRANTS	1	C-AJ 8099, C-AJ-8056, C-AJ-8143	MIXED PENETRANTS	1	C-AJ 8099, C-AJ 8056, W-J 8007, C-AJ 8143
	2	C-AJ-8099, C-AJ-8056, C-AJ-8143		2	C-AJ 8099, C-AJ 8056, W-J 8007, C-AJ 8143
	3	C-AJ-8099, C-AJ-8056		3	C-AJ 8041, C-AJ 8056, W-J 8007, C-AJ 8099
	4	C-AJ-8095		4	C-AJ 8095, W-J 8007
WOOD FLOORS			**GYPSUM WALLS**		
TYPE OF PENETRANT	**F-RATING (HR)**	**BASIS OF DESIGN UL SYSTEM**	**TYPE OF PENETRANT**	**F-RATING (HR)**	**BASIS OF DESIGN UL SYSTEM**
METAL PIPES OR CONDUIT	1	F-C-1009, F-C-1059, F-C-1168	METAL PIPES OR CONDUIT	1	W-L-1054, W-L-1058, W-L-1164, W-L-1506
	2	F-C-1009, F-C-1059, F-C-1168		2	W-L-1054, W-L-1058, W-L-1164, W-L-1506
				4	W-L-1110, W-L-1111, W-L-1165
NON-METALLIC PIPE OR CONDUIT	1	F-C-2232, F-C-2030, F-C-2160, F-C-2389	NON-METALLIC PIPE OR CONDUIT	1	W-L-2078, W-L-2075, W-L-2128
	2	F-C-2029, F-C-2030, F-C-2128, F-C-2160		2	W-L-2078, W-L-2075, W-L-2128
				4	W-L-2184, W-L-2245
SINGLE OR BUNDLED CABLES	1	F-C-3012, F-C-3110, F-C-3044	SINGLE OR BUNDLED CABLES	1	W-L-3065, W-L-3111, W-L-3112, W-L-3334, W-L-3414, W-L-3396
	2	F-C-3012, F-C-3110		2	W-L-3065, W-L-3111, W-L-3112, W-L-3334, W-L-3414, W-L-3396
				3	W-L-3385, W-L-3277
				4	W-L-3139, W-L-3334

INSULATED PIPES	1	F-C-5004, F-C-5037, F-C-5036	CABLE TRAY	1	W-L-4011, W-L-4019, W-L-4081
				2	W-L-4011, W-L-4019, W-L-4081
				4	W-L 8014
	2	F-C-5004, F-C-5037	INSULATED PIPES	1	W-L-5028, W-L-5029, W-L-5047
				2	W-L-5028, W-L-5029, W-L-5047
				4	W-L-5073
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	F-C-7013	NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	W-L 7017, W-L-7040, W-L-7042, W-L-7155
				2	W-L-7040, W-L-7042, W-L-7155
INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	N/A**	INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	W-L-7059, W-L-7153, W-L-7156, W-L-7151
	2	N/A**		2	W-L-7059, W-L-7153, W-L-7156, W-L-7151
MIXED PENETRANTS	1	F-C-8009, F-C-8014, F-C-8026	MIXED PENETRANTS	1	W-L-1095, W-L-8013
				2	W-L-1095, W-L-8013
				4	W-L-8014

COMPOSITE METALDECK FLOORS			
TYPE OF PENETRANT	**FLOOR COVERAGE**	**F-RATING (HR)**	**BASIS OF DESIGN UL SYSTEM**
CIRCULAR BLANK OPENINGS	2-1/2"	2	F-A-0040
	4-1/2"	2	F-A-0040, F-A-0041
SINGLE METALLIC PIPE OR CONDUIT (STEEL, IRON, COPPER)	2-1/2"	2	F-A-1192, F-A-1193
	4-1/2"	3	F-A-1192, F-A-1193
	4-1/2"	2	F-A-1194
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	2-1/2'	2	F-A-2310, FA-2311
	4-1/2"	2	F-A-2313, F-A-2314, F-A-2315, F-A-2316
	4-1/2"	3	F-A-2310, FA-2311, F-A-2312
SINGLE/CABLE BUNDLES	2-1/2"	3	F-A-3071, F-A-3072
SINGLE INSULATED PIPES	2-1/2"	2	F-A-5069, F-A-5070, F-A-5071
	4-1/2"	3	F-A-5069, F-A-5070, F-A-5071
MIXED PENETRANTS	4-1/2"	3	F-A-8055

END OF SECTION 07 8413

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and detail to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested and listed firestop systems shall be used in specific locations as follows:

1. Safing slot gaps between edge of floor slabs and perimeter curtain walls.

2. Openings between structurally separate sections of wall or floors.

3. Gaps between the top of walls and ceilings or roof assemblies.

4. Expansion joints in walls and floors.

1.4 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

1. Section 03 3000 - Cast-In-Place Concrete

2. Section 07 8413 - Penetration Firestopping

3. Section 07 9000 – Sealants

4. Section 09 2500 - Gypsum Drywall

1.5 REFERENCES

A. Underwriters Laboratories, Inc. (UL) Fire Resistance Directory, Volume II, updated annually:

1. Joint Systems (XHBN)
2. Perimeter Fire Containment Systems (XHDG)
3. Fire Resistance Ratings (BXRH)
4. Fill, Voids, or Cavity Material (XHHW)
5. Forming Materials (XHKU)

B. Omega Point Laboratories, Inc. (OPL) Listed Products Directory, Volume II, updated annually:

1. Fire Resistant Joint Systems

C. ASTM E 1966, “Standard Test Method for Fire-Resistive Joint Systems”

D. ASTM E 1399, “Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Width of Architectural Joint Systems”

E. ASTM E 84, “Standard Test Method for Surface Burning Characteristics of Building Materials”

F. ASTM E 2174, “Standard Practice for On-Site Inspection of Installed Fire Stops”

G. ASTM E 2307, “Standard Test Method for Determining the Fire Endurance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus.”

H. ANSI/UL 2079, “Tests for Fire Resistance of Building Joint Systems”

I. ASTM D6904, “Standard Practice for Resistance to Wind-Driven Rain”

J. International Firestop Council Recommended (IFC) Guidelines for Evaluating Firestop Systems Engineering Judgments

K. International Building Code (IBC 2009)

L. NFPA 101 - Life Safety Code

M. ASTM C679, “Standard Test Method for Tack-Free Time of Elastomeric Sealants”

1.6 QUALITY ASSURANCE

A. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

B. Firestop System installation shall meet requirements of ASTM E 1966 and/or ANSI/UL 2079 tested and listed assemblies that provide fire-resistance ratings not less than that of the construction in which the joint occurs.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no tested and listed system is available through a manufacturer, an engineering judgment derived from similar tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment documents shall follow requirements set forth by the International Firestop Council.

1.7 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of tested firestop systems to be used and manufacturer's installation instructions to comply with Section 01 3000.

B. Manufacturer's engineering judgment identification number and details when no tested and listed system is available for an application. Engineering judgment shall include both project name and contractor's name who will install firestop system as described in document.

C. Submit safety data sheets provided with product delivered to job-site.

1.8 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A manufacturer's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

B. The work is to be installed by a contractor with at least one of the following qualifications:

1. FM 4991 Approved Contractor

2. UL Approved Contractor

3. Hilti Accredited Fire Stop Specialty Contractor

C. Installer shall have not less than 3 years' experience with fire stop installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL or OPL label, where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

F. Comply with ASTM D 6905 (modified) for resistance to wind driven rain and water.

PART- 2 PRODUCTS

2.1 JOINT FIRESTOPPING - GENERAL

A. Provide firestopping composed of components that are compatible with each other and substrates forming joints under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each fire-resistive joint system that are 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.

C. Joints in or between Fire Rated Construction: Provide joint firestopping systems with ratings determined per UL 2079 or ASTM E 1966:

1. F-Rating: not less than the fire resistance rating of the construction they will join.

2. Firestop Top Track Seal: For metal stud partitions installed on flat concrete slab use one-piece, pre-formed, polyurethane foam based, firestop seal for use with standard head-joint top tracks, and slip-type head joints in fire-rated construction at top of partition to maintain continuity of the fire-resistance-rated assembly indicated. Provide in width and configuration required to accommodate depth and installation of studs and designed to saddle-over the top track.

3. Firestop Top Track Seal for metal deck: For metal stud partitions installed to underside of metal deck, use one-piece, pre-formed, polyurethane foam based, firestop seal for use with standard head-joint top tracks and slip-type head joints in fire-rated construction at top of partition to maintain continuity of the fire-resistance-rated assembly indicated. Provide in width and configuration required to accommodate depth and installation of studs and designed to saddle-over the top track. Refer to manufacturers installation instructions for plug and cover usage to completely seal off void's formed by metal deck flutes.

D. Joints at Exterior Curtain Wall / Floor Intersections: Provide joint firestopping systems with ratings determined per ASTM E 2307:

1. F-Rating: not less than the fire resistance rating of the construction they will join.

2. For the edge of slab conditions use pre-formed polyurethane foam based material for use as part of a perimeter fire barrier between fire resistance rated floors and exterior wall assemblies. Use tested systems HI/BPF 120-18, HI/BPF 120-19 issued by Intertek Laboratories.

3. For edge of slab conditions with a full height vision glass, or for conditions which do not contain an insulated spandrel at the floor line, only tested system HI/BPF 120-10 issued by Intertek Laboratories shall be used. If the tested system does not meet the project conditions, an engineering judgment derived from HI/BPF 120-10 shall be submitted to local authorities having jurisdiction for their review and approval prior to installation.

4. Basis of design: Preformed material for use as part of a perimeter fire barrier system between fire resistance rated floors and exterior wall assemblies,

E. Joints in Smoke Barriers: Provide joint firestopping systems with ratings determined per UL 2079:

1. L-Rating: Not exceeding 5.0 cfm/ft. of joint at both ambient and elevated temperatures.

F. Joints at Intersection between Rated Wall Assemblies and Nonrated Horizontal Assemblies: Provide joint firestopping systems with ratings determined by ASTM E 2837.

G. Mold Resistance: Provide joint firestopping system sealant with mold and mildew resistance rating of one (1) or less as determined by ASTM G21.

H. Rain and water resistance: provide perimeter joint sealant tested in accordance with ASTM D 6904 with less than 1 hour tack free time as tested in accordance with ASTM C 679.

2.2 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with joint systems (XHBN) listed in Volume II of the UL Fire Resistance Directory or OPL Listed Products Directory; provide products of the following manufacturer as identified below:

1. Basis of Design:

a. Hilti, Inc., Plano, Texas

b. Substitution requests shall be considered in accordance with contract provisions.

2.3 MATERIALS

A. Use only firestop products that have been tested in accordance with ASTM E 1966 and/or ANSI/UL 2079 for specific rated construction conditions conforming to construction assembly type, movement capability, spacing requirements, and fire-resistance-rating involved for each separate instance.

B. Sealants, sprays, or pre-formed materials for use with fire-rated construction joints and other gaps, the following products are acceptable:

1. Hilti Firestop Top Track Seal (CFS-TTS)

2. Hilti Firestop Top Track Seal for Metal deck (CFS-TTS MD)

3. Hilti Firestop Joint Spray (CFS-SP WB)

4. Hilti Firestop Silicone Joint Spray (CFS-SP SIL)

5. Hilti Flexible Firestop Sealant (CP 606)

6. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

7. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

8. Hilti bottom of wall sealant CP 605

C. Pre-formed materials or sealants for use as part of a Perimeter Fire Barrier System between fire-resistance-rated floors and exterior wall assemblies, the following products are acceptable:

1. Hilti Preformed Firestop System (CFS-EOS QuickSeal)

2. Hilti Firestop Joint Spray (CFS-SP WB)

3. Hilti Firestop Silicone Joint Spray (CFS-SP SIL)

4. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)

5. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)

D. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal deck profile; use as a backer for spray material.

1. Hilti Speed Plugs (CP 777)

2. Hilti Speed Strips (CP 767)

E. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal deck profile;

1. Hilti 1.5" Plug (CFS-TTS MD P1.5 - Plug)

2. Hilti 2" Plug (CFS-TTS MD P1.5 - Plug)

3. Hilti 3" Plug (CFS-TTS MD P1.5 - Plug)

4. Hilti 1.5" Cover (CFS-TTS MD C1.5 - Cover)

5. Hilti 2" Cover (CFS-TTS MD C2 - Cover)

6. Hilti 3" Cover (CFS-TTS MD C3 - Cover)

F. Provide a firestop system with an Assembly Rating as determined by ASTM E 1966 and/or ANSI/UL 2079 which is equal to the fire-resistance ratings of the construction in which the joint occurs.

PART- 3 EXECUTION

3.1 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

2. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

3. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

4. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Listed Products Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of construction joint materials.

1. Protect materials from damage on surfaces subjected to traffic.

3.3 FIELD QUALITY CONTROL

A. Examine sealed joints to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities and/or independent inspection agency.

C. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

D. Manufacturer’s Field Services: Contractor to ensure a manufacturer’s direct representative is on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. Training will be done per manufacturer’s written recommendations published in their literature and drawing details. During installation, contractor shall have manufacturer’s representative provide periodic visual observations and written documentation of the results. Contact Hilti for support at 800.879.8000.

3.4 IDENTIFICATION & DOCUMENTATION

A. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.

B. The Documentation Form for Construction Joints is to include:

1. A Sequential Location Number
2. The Project Name
3. Date of Installation
4. Detailed description of the Construction Joints location
5. Tested System or Engineered Judgment Number
6. Type of Construction Joint
7. The Width of the Joint
8. The Lineal Footage of the Joint
9. Number of sides addressed
10. Hourly rating to be achieved

11. Installers Name

C. Copies of these documents are to be provided to the general contractor at the completion of the project.

D. A firestop documentation manager software shall be used to document, track, and maintain the passive firestop systems throughout the construction and maintenance phase of the facility. The software solution shall be used to track and document every firestop system installed on the project and each subsequent addition, change, or removal of the firestop system. The firestop documentation shall be managed with a cloud-based software which allows the installer to use a standard smartphone or tablet device (either iOS, Android or Windows capable) to capture the relevant information for the installation. The following data shall be tracked for each penetration within the facility: product installed, system installed, date of installation, location of the penetration including a notation on the 2D plan image, F-rating, name of installer, photo (pre-installation and post-installation), and inspection status. The Owner and/ or Construction Manager may designate additional items to be tracked. The firestop documentation manager software must perform the following basic functions:

1. Create multiple projects/ facilities, add/create/ remove users for each project, upload documents including UL systems, 2D floor plans, product data, engineering judgments, etc.

2. Define data to track using pre-defined input fields or creating custom input fields as desired.

3. Capture multiple photos for each penetration, including a pre-installation and post-installation photo.

4. Scan QR Code on Hilti identification label to link the program data to a specific penetration location.

5. Annotate (mark) location of penetration on 2D floor plan.

6. Create reports by filtering data and utilizing report templates.

7. Online/ offline (for use in areas where data service is unavailable) synchronization of data between mobile device, online application and cloud-based system.

8. Ability to transfer ownership of projects from one customer to another from construction phase to facility maintenance.

E. Permanently attach Hilti identification labels to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove or change penetrating items or firestopping. Labels shall have a unique QR code for each penetration which can be scanned by the firestop documentation software to quickly identify the penetration attributes. Acceptable Software: Hilti CFS-DM, from Hilti Inc., Plano, TX. Tel (800) 879-8000 or Hilti (Canada) Corporation, Mississauga, Ontario (800) 363-4458 website: www.us.hilti.com or www.hilti.ca.com.

1. Substitutions: Not permitted.

2. Single Source: Obtain firestop documentation manager software and firestop systems for each type of penetration and construction condition indicated only from a single manufacturer.

3.5 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

3.6 LABOR USE TO INSTALL FIRESTOP SYSTEMS

A. To ensure complete harmony on the project site, the installation of each scope of work is to be performed jurisdictionally correct per existing trade agreements.

3.7 SCHEDULE OF MOST COMMON JOINT FIRESTOP SYSTEM

A. Schedule of joint firestop systems. Basis of design: Hilti, Inc.

Joint Type	**F-Rating (Hr)**	**Hilti Basis of Design UL System**	
		Joint Width Less than 2”	**Joint Width Greater than 2” Less than or Equal to 6” [4]**
Concrete (**Floor to Floor**)	1	FF-D-1012, FF-D-1013[1]	FF-D-1012, FF-D-1013
	2	FF-D-1012, FF-D-1013[1]	FF-D-1012, FF-D-1013
	3	FF-D-1011, FF-D-1026[1]	FF-D-1011, FF-D-1026
	4	FF-D-1047	FF-D-1125
Concrete (**Edge of Floor Slab to Wall)**	1	FW-D-1011, FW-D-1012, FW-D-1013	FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021
	2	FW-D-1011, FW-D-1012, FW-D-1013	FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021, HI-BPF 120-18, HI-BPF 120-19
	3	FW-D-1011	FW-D-1011, FW-D-1021
	4	FW-D-1047	FW-D-1092
Concrete (**Edge of Floor Slab to Curtain wall**)	2	HI-BPF 120-18, HI-BPF 120-19	HI-BPF 120-18, HI-BPF 120-19
Concrete or Block Wall to Flat Concrete Floor (**Top-of-Wall**)	1	N/A**	N/A**
	2	HW-D-0097[1]	HW-D-1009

	3	HW-D-1008[1], HW-D 0268	HW-D-1008
	4	HW-D-1042	HW-D-1103
Concrete or Block Wall to Concrete Over Fluted Metal Deck (**Top-of-Wall)**	1	HW-D-0098	N/A**
	2	HW-D-0080, HW-D-0081, HW-D-0098	HW-D-1037
	3	N/A**	N/A**
	4	HW-D-0294	N/A**
Gypsum Wall to Flat Concrete Floor (**Top-of-Wall)**	1	HW-D-0757, HW-D-0082, HW-D-0083, HW-D-0106, HW-D-0119	HW-D-1011, HW-D-1012, HW-1020
	2	HW-D-0757, HW-D-0082, HW-D-0083, HW-D-0106, HW-D-0119	HW-D-1011, HW-D-1012, HW-1020
	3	HW-D-0119	HW-D-1011, HW-D-1012, HW-1020
Gypsum Shaft Wall to (**Top-of-Wall)**	2	HW-D-0342 (FLAT CONCRETE) HW-D-0541, HW-D-0542 (CONCRETE OVER METAL DECK)	N/A**
Gypsum Shaft Wall to Concrete Floor (**Bottom-of-Wall)**	1	BW-S-0023	N/A**
	2	BW-S-0023	N/A**
Gypsum Wall to Concrete Floor (**Bottom-of-Wall)**	1	BW-S-0001, BW-S-0002, BW-S-0039	N/A**
	2	BW-S-0001, BW-S-0002, BW-S-0039	N/A**
Gypsum Wall to Concrete Over Fluted Metal Deck (**Top-of-Wall)**	1	HW-D-0042*, HW-D-0049*, HW-D-0087*, HW-D-0089*, HW-D-0045, HW-D-0046*, HW-D-0076*, HW-D-0077*, HW-D-0154, HW-D-0184*, HW-D-0292, HW-D-0295, HW-D-538*, HW-D-0871, HW-D-0872, HW-D-0873, HW-D-0875, HW-D-0884, HW-D-0876, HW-S-0134, HW-D-0881, HW-D-0881, HW-D-0882, HW-D-0883	HWD-1011, HWD-1012, HW-1020
	2	HW-D-0042*, HW-D-0049*, HW-D-0087*, HW-D-0089*, HW-D-0045, HW-D-0046*, HW-D-0076*, HW-D-0077*, HW-D-0154, HW-D-0184*, HW-D-292, HW-D-0295, HW-D0538*, HW-D-0871, HW-D-0872, HW-D-0873, HW-D-0874, HW-D-0875, HW-D-0884, HW-D-0876, HW-S-0134, HW-D-0881, HW-D-0881, HW-D-0882, HW-D-0883	HW-D-1011, HW-D-1012, HW-D-1020
	3	HW-D-0292, HW-D-0295	HWD-1011, HWD-1012, HW-1020
	4	HW-D-0292, HW-D-0295	N/A**

Concrete (**Wall to Wall**)	2	WW-D-0017, WW-D-0082	WW-D-1080, WW-D-1084
	3	WW-D-1011[1], WW-D-0032	WW-D-1011
	4	WW-D-1047	WW-D-1128
Gypsum to Concrete (**Wall to Wall)**	1	WW-D-0040	N/A**
	2	WW-D-0040	N/A**

* SEE NOTE 3 ** CONTACT HILTI FOR CURRENT UL-CLASSIFIED SYSTEM OR ENGINEER JUDGMENT DRAWING: 800-879-8000

NOTES:

1. CLASSIFIED SYSTEMS FOR 2" - 6" WIDE JOINTS MAY BE USED FOR JOINTS 2" WIDE AND LESS.
2. CONFIRM THAT MOVEMENT CAPABILITIES OF THE SELECTED UL SYSTEM MEETS OR EXCEEDS THE SPECIFIED MOVEMENT RANGE OF THE PARTICULAR JOINT.
3. SYSTEMS MARKED WITH ASTERIK (*) ARE SUITABLE FOR TOP-OF-WALL JOINTS WHERE THE FLUTED METAL DECK HAS SPRAY-ON MONOKOTE MK-6/HY FIREPROOFING.
4. VERIFY ALLOWABLE JOINT WIDTH ON SPECIFIC UL SYSTEM DRAWING.

END OF SECTION 07 8443

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DESCRIPTION OF WORK

A. The required application of sealants include, but are not limited to the following general locations:

1. Expansion joints in exterior and interior concrete slabs and walks.
2. Intersections of concrete walks and slabs with vertical surfaces.
3. Exterior wall joints, and dissimilar materials.
4. Vertical joints on siding material.
5. Metal doorframes, window frames and storefront framing.
6. Joints between items of equipment and other construction.
7. Control joints in interior walls.
8. Joints between dissimilar materials.
9. Locations indicated on drawings.

1.3 QUALITY ASSURANCE

A. Installer:

1. A firm with a minimum of 5 years' successful experience in the application of the types of materials required, and who agrees to employ only skilled tradesmen for the work.

1.4 SUBMITTALS

A. Samples:

1. Submit samples of each color required for each type of sealant exposed to view. It shall be the Contractor's responsibility to match color to adjacent wall system or material.

2. Install sample between 2 strips of material similar to or representative of typical surfaces where sealant or compound will be used, held apart to represent typical joint widths. Architect will review samples.

3. Compliance with all other requirements is the exclusive responsibility of the Contractor.

B. Guarantee:

1. Submit written guarantee agreeing to repair or replace sealants which fail to perform as air-tight and water-tight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data, as an inherent quality of the material for the exposure indicated. Provide guarantee signed by the Installer and Contractor.

2. Guarantee period is two (2) years.

1.5 JOB CONDITIONS

A. Condition of Other Work:

1. Examine the joint surfaces, backing, and anchorage of units forming sealant rabbet, and the conditions under which the sealant work is to be performed. Do not proceed with the sealant work until unsatisfactory conditions have been corrected.

B. Weather Conditions:

1. Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below 40 deg F or above manufacturer's recommended limitations for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and variations, install elastomeric sealants only when temperatures are in the lower third of the manufacturer's recommended installation temperature range.

PART- 2 PRODUCTS

2.1 MATERIALS

A. Sealant: MasterSeal NP 1 by BASF or accepted equal. One component polyurethane sealant complying with ASTM C920; Type S, Grade NS, Class 35 and Use NT.

B. Silicone Sealant: Silpruf 2000 by General Electric or accepted equal. Single component silicone sealant complying with ASTM C920; type S, Grade NS, Class 25 and Use NT.

C. Concrete Slab Joint Sealant: MasterSeal SL1 sealant by BASF or accepted equal. One component elastomeric, self-leveling polyurethane sealant complying with ASTM C920; Type S, Grade P, Class 25, and Use T.

D. Joint Primer/Sealer: As recommended by sealant manufacturer for joint surfaces to be primed or sealed.

E. Backer Rod: Closed cell polyethylene Sonofoam backer rod joint filler and backing by Sonneborn or accepted equal.

1. Colors:

a. Exterior - match exterior surface to adjacent color.

b. Windows - match window surface.

c. All Other Locations - color as selected by Architect.

PART- 3 EXECUTION

3.1 INSPECTION

A. The Installer must examine the substrate and the conditions under which caulking work is to be performed, and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the work until satisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 JOINT SURFACE PREPARATION

A. Clean joint surfaces immediately before installation of sealant. Remove dirt, insecure coatings, moisture and other substances, which would interfere with bond of sealant or caulking compound.

B. Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION

A. Comply with sealant manufacturer's printed instructions except where manufacturer's technical representative directs otherwise.

B. Prime or seal the joint surfaces wherever recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

C. Install sealant backer rod for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.

D. Install bond breaker tape wherever shown and wherever required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.

E. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

F. Install sealants to depths as recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead.

G. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.

H. Tool non-sag sealants immediately after sealant application and prior to skinning or curing begin; tool sealants to form smooth, uniform beads of configuration indicated eliminating air pockets and ensuring contact and adhesion of sealant with side of joint. Do not use tooling agents which discolor sealants or adjacent surfaces, or that are not approved by sealant manufacturer.

I. Provide concave joint configuration per figure 5A, ASTM C 1193, unless noted otherwise.

1. Spillage:

    a. Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces including rough textures such as exposed aggregate panels. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either the primer/sealer to the sealant/caulking compound.

    b. Remove excess and spillage of compounds promptly as the work progresses. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage, without damage to the adjoining surfaces or finishes.

2. Polysulfide Sealant Installation:

    a. Comply with standards issued by manufacturer, except where more stringent requirements have been issued by the sealant manufacturer as either requirements or recommendations.

3.4 CURE AND PROTECTION

A. Cure sealants in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.

B. Project joint sealers from contaminants and damage during and after curing period, so that they are without damage or deterioration at the time of substantial completion. Cutout and remove damaged or deteriorated joint sealers immediately and replace with new materials producing a repair that is indistinguishable from the original work.

END OF SECTION 07 9000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and detail to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DEFINITIONS

A. Acoustic Joint Sealant: "Acoustic Joint Sealant or Spray: Material or combination of materials used to achieve specified acoustical rating of non fire-rated assembly by providing an effective barrier against sound transmission through construction joint and through penetration openings."

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested acoustic systems shall be used in specific locations as follows:

B. Top and bottom of gypsum board partitions.

C. Top of masonry walls.

D. Through-penetrations in gypsum and masonry walls.

1.4 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

B. Section 03 3000 – Concrete

C. Section 07 8443 - Joint Firestopping

D. Section 07 9000 - Sealants

E. Section 09 2500 - Gypsum Drywall

F. Section 21 0000 – Fire Suppression

G. Section 22 0000 – Plumbing

H. Section 23 0000 – Heating, Ventilating, and Air-Conditioning

I. Section 26 0000 – Electrical

J. Section 27 0000 – Communications

1.5 REFERENCES

A. Test Requirements:

B. ASTM C734, Standard Test Method for Low-Temperature Flexibility of Latex Sealants After Artificial Weathering

C. ASTM C834, Standard Specification for Latex Sealants

D. ASTM C919, Standard Practice for Use of Sealants in Acoustical Applications

E. ASTM D217, Standard Test Methods for Cone Penetration of Lubricating Grease

F. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials

G. ASTM E90, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

H. ASTM G21, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

I. ISO 11600, Building construction -- Jointing products -- Classification and requirements for sealants

J. All major building codes: IBC

1.6 QUALITY ASSURANCE

A. Installing contractor shall arrange for the acoustic joint sealant manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of acoustic sealant and spray systems to train appropriate contractor personnel in proper selection and installation procedures.

B. Acoustical sealants shall be installed per manufacturer's written recommendations published in their literature and drawing details.

1.7 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including documentation of STC testing and manufacturer's installation instructions in accordance with Section 01 3000.

B. Submit material safety data sheets provided with product delivered to jobsite.

C. VOC Content Limitations: Submit documentation of conformance with LEED EQ Credit 4.1 “Low-Emitting Materials, Adhesives, and Sealants.”

1.8 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the acoustic sealant and acoustic spray manufacturer as having been provided the necessary training to install manufacturer’s products per specified requirements. A manufacturer’s willingness to sell its acoustical sealant products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at jobsite.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of acoustical sealants after completion of gypsum wall board but prior to covering or concealing of joints.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of acoustical sealant materials when temperatures are outside the manufacturers recommended limitations.

E. During installation, provide masking and drop cloths to prevent acoustical sealant materials from contaminating any adjacent surfaces.

PART- 2 PRODUCTS

2.1 ACOUSTICAL SEALANTS

A. Acoustic Sealant for Exposed and Concealed Joints and annular spaces around through-penetrations: Provide manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C834, ASTM C919 and the following:

1. Sealant effectively reduces airborne sound transmission through head-of-wall and bottom-of-wall joints and openings to accommodate through-penetrations in building construction as demonstrated by testing representative assemblies in accordance with ASTM E90.

2. Acoustical Sealant to maintain STC ratings at sound rated partitions as indicated on the drawings.

3. Sealant has flame-spread and smoke-developed ratings of less than 25 as tested in accordance with ASTM E84.

4. Sealant is mold and mildew resistant per ASTM G21 with a rating of zero (0), "no growth".

5. Sealant has movement capability of minimum 12.5% in accordance with ISO 11600.

6. Latex sealant according to ASTM C 834 class OP -18°C with shrinkage according to ASTM C 1241 < 25 % C.

7. Proposed acoustic sealant materials and methods shall conform to applicable governing codes having local jurisdiction.

2.2 ACOUSTICAL SPRAYS

A. Acoustic Spray for exposed and concealed joints: Provide manufacturer's standard sprayable latex material complying with ASTM C919 and the following:

1. Spray effectively reduces airborne sound transmission through head-of-wall joints in building construction as demonstrated by testing representative assemblies in accordance with ASTM E90.

2. Acoustical Spray to maintain STC ratings at sound rated partitions as indicated on the drawings.

3. Spray has flame-spread and smoke-developed ratings of less than 25 as tested in accordance with ASTM E84.

4. Spray is mold and mildew resistant per ASTM G21 with a rating of zero (0), "no growth".

5. Spray has movement capability of minimum 12.5%.

6. Proposed acoustic spray materials and methods shall conform to applicable governing codes having local jurisdiction.

2.3 ACCEPTABLE MANUFACTURERS

A. Basis of Design:
Hilti, Inc., Plano, Texas
800-879-8000
www.hilti.com

B. Substitution requests shall be considered in accordance with contract provisions and the performance requirements outlined in this document.

2.4 MATERIALS

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

1. Hilti CP 506 Smoke and Acoustic Sealant

2. Hilti CP 572 Smoke and Acoustic Spray

3. Hilti CP605 bottom of wall sealant

2.5 ACCESSORIES

A. Mineral wool

PART- 3 EXECUTION

3.1 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify acoustic joints are properly sized and in suitable condition for application of materials.

2. Surfaces to which acoustic sealant and spray materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.

3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by acoustic sealant and spray materials.

4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of acoustic sealant and spray.

5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with acoustic sealant and spray manufacturer's written installation instructions for products and applications indicated.

B. Standards: Comply with recommendations of ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated.

C. Install acoustic sealant backings of type indicated to support sealant and spray during application in accordance with manufacturer's written installation instructions.

D. Install acoustic sealant and spray free of air pockets, embedded foreign matter, sags and ridges.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess acoustic sealant from surfaces adjacent to joint.

2. Remove excess acoustic spray from surfaces adjacent to joint as indicated on the drawings.

3. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

4. Provide concave joint configuration per Figure 8A in ASTM C1193, unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

A. Examine acoustic joints and penetrations to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturer of acoustical joint sealants.

B. During the course of the Work and on completion, remove and dispose of excess materials, equipment and debris away from premises.

3.5 PROTECTION

A. Protect acoustic joints during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Contract Completion.

END OF SECTION 07 9219

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section references specification sections relating to commercial door hardware for the following:

1. Swinging doors.

2. Other doors to the extent indicated.

B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.

2. Electromechanical and access control door hardware.

3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.

4. Automatic operators.

5. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Hardware”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

2. ICC/IBC - International Building Code.

3. NFPA 70 - National Electrical Code.

4. NFPA 80 - Fire Doors and Windows.

5. NFPA 101 - Life Safety Code.

6. NFPA 105 - Installation of Smoke Door Assemblies.

7. State Building Codes, Local Amendments.

E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.

    b. Manufacturer of each item.

    c. Fastenings and other pertinent information.

    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.

    e. Explanation of abbreviations, symbols, and codes contained in schedule.

    f. Mounting locations for door hardware.

    g. Door and frame sizes and materials.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.6 MAINTENANCE SERVICE

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

PART- 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Refer to “PART 3 – EXECUTION” for required specification sections.

PART- 3 EXECUTION

3.1 DOOR HARDWARE SETS

A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.

1. Section 08 71 00 – Door Hardware.

C. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. YA - Arrow, formerly known as Yale
5. HS - HES
6. RF - Rixson
7. OT - Other
8. SU - Securitron

Hardware Sets

Set: 1.0

Doors: 1-101

1	Continuous Hinge	CFM_HD1-M		PE
1	Storeroom or Closet Lock	MOR3 8805FL Temp Core	626	YA
1	Core	Match existing; field verify	626	YA
3	Silencer	608		RO
1	Wall Stop	RM860/RM861 (As required)	US32D0	RO

Set: 2.0

Doors: 1-103

1	Door Hardware	Hardware by door manufacturer (Cylinder as required)	OT

END OF SECTION 08 0671

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.

2. Steel sidelight, borrowed lite and transom frames.

3. Louvers installed in hollow metal doors.

4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 01 Section "General Conditions".

2. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.

3. Division 08 Section "Glazing" for glass view panels in hollow metal doors.

4. Division 08 Section "Door Hardware".

5. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.

3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.

4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.

6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.

10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.

11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.

12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.

13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.

14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.

15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.

16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.

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

3. Smoke Control Door Assemblies: Comply with NFPA 105.

    a. Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Storm Shelter Openings: Provide complete door systems for hurricane or tornado storm shelters, and other areas of refuge, complying and tested according to ICC 500 (2014/2020), ICC/NSSA Standard for the Design and Construction of Storm Shelters.

1. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

F. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

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

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.5 PROJECT CONDITIONS

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

1.6 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).

2. Curries Company (CU).

3. Pioneer Industries (PI).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.

2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.

    a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.

4. Vertical Edges: Vertical edges to have the face sheets spot welded and filled full height with an epoxy filler. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).

5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.

6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.

7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Manufacturers Basis of Design:

1. CECO Door Products (C) Polystyrene Core - Legion Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16” positive thermal break and integral vinyl weatherstripping.

C. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.

2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.

3. Manufacturers Basis of Design:

a. CECO Door Products (C) – Thermal Break TQB Series.

D. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.

2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.

3. Manufacturers Basis of Design:

a. CECO Door Products (C) - DU Series.

b. CECO Door Products (C) - SU Series.

E. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.

2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LOUVERS

A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.

1. Blade Type: Vision proof inverted V or inverted Y.

2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.

1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.

2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.7 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.9 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.

2. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.

3. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.

5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.

7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.

8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

9. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        i. Two anchors per jamb up to 60 inches high.

        ii. Three anchors per jamb from 60 to 90 inches high.

        iii. Four anchors per jamb from 90 to 120 inches high.

        iv. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

    b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        i. Three anchors per jamb up to 60 inches high.

        ii. Four anchors per jamb from 60 to 90 inches high.

iii. Five anchors per jamb from 90 to 96 inches high.

iv. Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.

v. Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.

3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.10 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART- 3 EXECUTION

3.1 EXAMINATION

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

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.

4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.

b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.

c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.

d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 08 1113

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required completing this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section includes the following types of access doors: Locations of doors shall be coordinated with all trades and shall be the responsibility of the contractor to furnish and install access doors as may be required. Door shall be located at any concealed mechanical device requiring access. Provide door size as required for proper access.

1. Wall access doors.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain access doors for entire Project from one source and by a single manufacturer.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per test method as indicated below, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Test Method for Vertical Installations: ASTM E 152.

2. Test Method for Horizontal Installations: ASTM E 119.

C. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

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

1. Karp Associates, Inc.

2. J.L. Industries.

3. Larson's Manufacturing Co.

2.2 MATERIALS

A. Steel Sheet: ASTM A 366/A 3366M commercial-quality, cold-rolled steel sheet with baked-on, rust-inhibitive primer.

2.3 ACCESS DOORS - EXPOSED AREAS

A. Fire-Rated Access Doors – KRP – 450 FR, as manufactured by Karp Associates Inc. or equal.

1. Self-latching units consisting of frame, door, and hardware, including automatic-closer, interior latch release, and complying with the following requirements:

a. Trimless Frame.

B. Non-insulated Doors for Walls: KDW as manufactured by Karp Associates, or equal.

1. Self-latching units consisting of frame, door, and hardware, and complying with the following requirements:

a. Trimless Frame.

2.4 PARTS

A. Access Doors: WB EXT 1350 Ultra Exterior Access Door

1. Door: 16-gauge steel, trim 1-1/2” wide.

2. Frame: 16-gauge steel, 2-3/8” depth.

3. Insulation: Double layer of 1” GreenGuard Extruded Polystyrene insulation board, with R-Value @ 75 degrees F. Mean 5.0 x 2, FM approved.

4. Gaskets: Open celled microcellular polyurethane on inside of door. Closed cell neoprene sponge SC42 W/PSA stripping gasketing on the back of the door.

5. Hinge: Continuous piano hinge allows opening to 180 degrees; located at the top of the door.

6. Latches: Chrome plated “T” type handle with pivot rod 3-point catch. WB 151 keycode cylinder lock.

7. Finish: Zinc dipped baked grey enamel; prepared for final paint.

8. Application: For exterior purposes.

    a. Size: 24” x 24”.

2.5 FABRICATION

A. General: Manufacture each access door assembly as an integral unit, ready for installation.

B. Steel Access Doors and Frames: Continuous welded construction. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required securing access panels to types of supports indicated.

    1. For gypsum board assemblies, furnish frames with edge trim for gypsum board.

PART- 3 EXECUTION

3.1 PREPARATION

A. Advise Installer of other work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

B. Furnish inserts and anchoring devices for access doors that must be built into other construction. Coordinate delivery with other work to avoid delay.

3.2 INSTALLATION

A. Comply with manufacturer's instructions for installing access doors. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finished surfaces.

B. Install concealed-frame access doors flush with adjacent finish surfaces.

C. Locate access doors above ceilings wherever possible.

END OF SELECTION 08 3050

PART- 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Provide all materials, labor, equipment and services necessary to furnish, deliver and install all work under this section as shown on the contract documents, specified herein, and as specified by the job conditions.

1.2 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required completing this section whether or not it is clearly or explicitly shown.

1.3 DESCRIPTION

A. Related work specified elsewhere:

1.	Metal Fabrication.	Section 05 5000
2.	Rough Carpentry.	Section 06 1000
3.	Access Panels & Doors:	Section 08 3050
4.	Painting:	Section 09 9000
5.	Electrical:	Division 26

1.4 SUBMITTALS

A. Procedures: Furnish submittals in accordance with the general requirements specified.

B. Shop Drawing: Furnish shop drawings for architect's approval. Include elevations, sections, and details indicating dimensions, materials, finishes, conditions for anchorage and support of each coiling security grille.

C. Product Literature: Submit manufacturer's technical literature describing the product to be used under this section.

D. Maintenance and Operating Manuals: Furnish complete manuals describing the materials, devices and procedures to be followed in operating and maintaining all coiling security grilles under this section. Include manufacturer's brochures and parts lists describing the actual materials used in the product.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of federal, state and municipal authorities having jurisdiction.

B. Manufacturer Requirements: Coiling security grille manufacturer shall have been in the business of and have experience in manufacturing the type of product covered under this specification section as well as giving credible service for a minimum of five (5) years. Provide list of at least ten (10) completed projects which include the products covered under this section.

1.6 DELIVERY, STORAGE AND HANDLING

A. General: Deliver and store materials in manufacturer's original packaging, labeled to show name, brand and type. Store materials in a protected dry location off the ground in accordance with manufacturer's instructions.

1.7 WARRANTY

A. Coiling Security Grille Warranty: Provide Two (2) Year Warranty signed by the manufacturer and installer agreeing to repair or replace work which has failed as a result of defects in materials or workmanship. Upon notification within the warranty period, such defects shall be repaired at no cost to the owner.

PART- 2 PRODUCTS

2.1 COILING SECURITY GRILLES

A. Manufacturer: Side coiling security grilles shall be the model SC3000G-SL9-A as manufactured by McKEON or equal.

2.2 MATERIALS

A. General: Each unit shall consist of an open type grille curtain designed to travel in a horizontal plane, smoothly and without binding. Curtain shall be driven to the open and close position by a positive action sprocket drive, without the use of cables or counterbalance weights.

1. Grille Curtain: Shall be the SL9 pattern consisting of 5/16" diameter solid galvanized steel rods, encased by 3/8” aluminum tubular spacers 9” long. The horizontal links shall be fabricated of 1/8” x 5/8” aluminum strips and shall be set in a straight lattice pattern. The vertical spacing shall be 1½” while the horizontal spacing shall be 9”.

B. Leading Edge: Curtain shall be furnished with an aluminum member of tubular design to provide stiffness, limit deflection and provide for a tight fitting closure.

C. Receiving Edge: Shall be fabricated of an extruded aluminum member with sufficient depth, designed to accept the leading edge and form a tight fitting closure when the grille is the fully closed position.

D. Head Track: Shall be of not less than 1/8" thick steel and shall be provided with integral locking bars. The faying surface shall not be less than 38% of the flat plate area when the side coiling grille is in the closed position. Locking bars shall lock and retain the coiling curtain in place. Unit shall not require or utilize any type of floor track system.

E. Counterbalance Assemblies: The side coiling grille shall be counterbalanced by means of adjustable steel helical torsion springs attached to shaft enclosed in pipe with required mounting blocks for attachment of curtain. Torsion springs shall be anchored to the same shaft and held in position by the same adjusting wheel accessible from outside the barrel assemblies.

F. Coil Box: Shall be provided to entirely enclose coiled curtain and counterbalance assemblies. Coil box cover shall be of a rectangular design fabricated of 22 gauge G90 galvanized sheet steel.

G. Electric Motor Operator: Side coiling grille shall be provided with a compact power unit designed and built by the side coiling grille manufacturer. Operator shall be equipped with an adjustable screw-type limit switch to break the circuit at termination of travel. High efficiency gearing running in an oil bath, shall be furnished together with a magnetic operated brake, completely housed to protect against damage, dust and moisture. An efficient overload protection device, which will break the power circuit and protect against damage to the motor windings shall be integral with the unit. Operator is to be housed in a NEMA type 1 enclosure.

1. Motor: Shall be intermediate duty, thermally protected, ball bearing type with a class A or better insulation. Horsepower of motor is to be 1/3hp minimum or of manufacturer's recommended size, which ever is greater.

2. Starter: Shall be size "0" magnetic reversing starter, across the line type with mechanical and electrical interlocks, with 10 amp continuous rating and 24 volt control circuit.

3. Reducer: Spiral gear type, 70% efficiency minimum.

4. Brake: Magnetically activated, integral within the operator's housing.

5. Control Station: Provide surface mount push button control station marked open, close and stop.

H. Obstruction Sensing Device: The side coiling grille shall be designed with a radio activated obstruction sensing safety edge. In the event that the safety edge meets an obstruction during the normal closing operation, the grille shall stop, reverse and return to the open position.

I. Finish After completion of fabrication, clean all metal surfaces to remove dirt and chemically treat to provide for paint adhesion. All steel components shall receive a coat of prime paint finish, all exposed aluminum shall be of a clear anodized.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces and field conditions to which this work is to be performed and notify architect if conditions of surfaces exist which are detrimental to proper installation and timely completion of work.

B. Verify all dimensions taken at job site affecting the work. Notify the architect in any instance where dimensions vary.

C. Coordinate and schedule work under this section with work of other sections so as not to delay job progress.

3.2 INSTALLATION

A. Perform installation using only factory approved and certified representatives of the coiling security grille manufacturer.

B. Install coiling security grille assemblies at locations shown in perfect alignment and elevation, plumb, level, straight and true.

C. Adjust coiling security grille installation to provide uniform clearances and smooth non-binding operation.

D. Install wiring in accordance with applicable local codes and the National Electrical Code Standard. Materials shall be UL listed.

3.3 PROTECTION AND CLEANING

A. Protect installed work using adequate and suitable means during and after installation until accepted by owner.

B. Remove, repair or replace materials which have been damaged in any way.

C. Clean surfaces of grime and dirt using acceptable and recommended means and methods.

END OF SELECTION 08 3300

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.

2. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

2. ICC/IBC - International Building Code.

3. NFPA 70 - National Electrical Code.

4. NFPA 80 - Fire Doors and Windows.

5. NFPA 101 - Life Safety Code.

6. NFPA 105 - Installation of Smoke Door Assemblies.

7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.

2. UL10C - Positive Pressure Fire Tests of Door Assemblies.

3. ANSI/UL 294 - Access Control System Units.

4. UL 305 - Panic Hardware.

5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.

    b. Manufacturer of each item.

    c. Fastenings and other pertinent information.

    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.

    e. Explanation of abbreviations, symbols, and codes contained in schedule.

    f. Mounting locations for door hardware.

    g. Door and frame sizes and materials.

    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.

2. Plans for existing and future key system expansion.

3. Requirements for key control storage and software.

4. Installation of permanent keys, cylinder cores and software.

5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.

3. Review sequence of operation narratives for each unique access controlled opening.

4. Review and finalize construction schedule and verify availability of materials.

5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.

2. Faulty operation of the hardware.

3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART- 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to Arrow. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded Arrow.

D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

    a. Two Hinges: For doors with heights up to 60 inches.

    b. Three Hinges: For doors with heights 61 to 90 inches.

    c. Four Hinges: For doors with heights 91 to 120 inches.

    d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

    a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.

    b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

    a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

    b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

    a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

    a. McKinney (MK) - TA/T4A Series, 5 knuckle.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

    a. Pemko (PE).

2.3 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.

2. Furnish dust proof strikes for bottom bolts.

3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.

4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

    a. Ives (IV).

    b. Rockwood (RO).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.

2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.

3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.

4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.

5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

6. Manufacturers:

    a. Hiawatha, Inc. (HI).

    b. Rockwood (RO).

    c. Trimco (TC).

2.4 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

1. Manufacturers:

    a. Schlage (SC).

    b. Match Existing, Field Verify.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.

2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.

3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.

4. Tubular deadlocks and other auxiliary locks.

5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

6. Keyway: Match Facility Standard.

C. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.

2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)

2. Master Keys (per Master Key Level/Group): Five (5).

3. Construction Control Keys (where required): Two (2).

4. Permanent Control Keys (where required): Two (2).

F. Construction Keying: Provide temporary keyed construction cores.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.

2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Manufacturers:

a. Arrow, formerly known as Yale (YA) - 8800FL Series.

b. Corbin Russwin Hardware (RU) - ML2000 Series.

c. dormakaba Best (BE) - 45H Series.

B. Cylindrical Locksets, Grade 1 (Commercial Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.

1. Locks are to be non-handed and fully field reversible.

2. Manufacturers:

    a. Arrow, formerly known as Yale (YA) 4700LN Series.

    b. Corbin Russwin Hardware (RU) - CL3500 Series.

    c. dormakaba (DO) - CL800 Series.

2.6 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.

2. Strikes for Bored Locks and Latches: BHMA A156.2.

3. Strikes for Auxiliary Deadlocks: BHMA A156.36.

4. Dustproof Strikes: BHMA A156.16.

2.7 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

B. Exit devices shall have a five-year warranty.

C. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

D. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

E. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

F. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

G. Flush End Caps: Provide flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.

H. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

1. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.

2. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

I. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

J. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

K. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

L. Rail Sizing: Provide exit device rails factory sized for proper door width application.

M. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

N. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

a. Arrow, formerly known as Yale (YA) - 7000 Series.

b. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.

c. Von Duprin (VD) - 35A/98 XP Series.

2.8 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Heavy duty surface mounted door closers shall have a 30-year warranty.

2. Manufacturers:

    a. Arrow, formerly known as Yale (YA) - 4400 Series.

    b. Corbin Russwin Hardware (RU) - DC6000 Series.

    c. Norton Rixson (NO) - 7500 Series.

C. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted closers with door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.

1. Manufacturers:

    a. Arrow, formerly known as Yale (YA) - Unitrol Series.

    b. Corbin Russwin Hardware (RU) - Unitrol Series.

    c. Norton Rixson (NO) - Unitrol Series.

2.9 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

    a. Hiawatha, Inc. (HI).

    b. Ives (IV).

    c. Rockwood (RO).

2.10 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Hiawatha, Inc. (HI).

    b. Ives (IV).

    c. Rockwood (RO).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

a. dormakaba (DO).

b. Norton Rixson (RF).

c. Rockwood (RO).

2.11 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

2. DHI TDH-007-20: Installation Guide for Doors and Hardware.

3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

   1. Quantities listed are for each pair of doors, or for each single door.

   2. The supplier is responsible for handing and sizing all products.

   3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

   4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Refer to Section 08 0671, Door Hardware Sets, for hardware sets.

END OF SECTION 08 7100

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown

1.2 DESCRIPTION OF WORK

A. Gypsum drywall work is hereby defined to include all gypsum board work and a tape-and compound joint treatment system known as “drywall finishing” work.

B. The types of work required includes but is not limited to the following:

1. Gypsum drywall including metal support system.
2. Gypsum shaft wall construction.
3. Gypsum backing boards for application of other finishes.
4. Cementitious backer units.
5. Gypsum drywall ceilings.
6. Sound dampening gypsum drywall.
7. Drywall finishing (joint tape-and-compound treatment).
8. Metal support systems for cementitious backer panels.
9. Installing access doors.
10. Acoustical Sealants.

1.3 QUALITY ASSURANCE

A. Fire-Resistance Rating: Where work is indicated for fire-resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies

which have been tested and listed by recognized authorities and acceptable to authorities having jurisdiction, including UL, WH and the Gypsum Association.

B. Fire Resistance Ratings: Refer to Drawings.

C. Industry Standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated, including the recommendations of the manufacturer.

D. Allowable Tolerance:

1. 1/16" offsets between planes of board faces, and 1/8" in 10'-0" for plumb, level, warp and bow.

1.4 PRODUCT HANDLING

A. Deliver gypsum drywall materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry, well-ventilated space, protected from the weather, under cover and off the ground.

1.5 JOB CONDITIONS

1. Temperature and Humidity Conditions: Do not install joint treatment compounds unless installation areas comply with the minimum temperatures and ventilation requirements recommended by the manufacturer and conditions are acceptable to the installer.

2. During the period of laminating and of finishing wallboard joints, maintain a temperature within the building uniformly between 55 deg and 70 deg F. Provide adequate ventilation to eliminate excessive moisture. Avoid drafts during hot, dry weather to prevent finishing materials from drying to rapidly.

3. Coordinate with installation of metal stud wall systems and insulation.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

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

1. Steel Framing and Furring:

a. United States Gypsum.

b. National Gypsum Co. - Gold Bond Building Products Div.

c. Dietrich Industries, Inc.

2. Grid Suspension Assemblies:

a. Chicago Metallic Corp.

b. Armstrong World Industries, Inc.

c. United States Gypsum.

3. Interior and Exterior Gypsum Board and Related Products:

a. United States Gypsum.

b. Georgia-Pacific Corp.

c. National Gypsum Co., Gold Bond Building Products Div.

4. Gypsum Shaftwall Studs and Liner Panel:

a. United States Gypsum.

b. Domtar Gypsum.

c. Georgia-Pacific Corp.

2.2 METAL SUPPORT MATERIALS

A. Wire for Hangers and Ties:

1. ASTM A 641, soft temper, #8 gauge galvanized annealed steel wire for hangers, 16- gauge minimum annealed steel wire for ties.

B. Hanger Rods: Mild steel and zinc-coated or protected with rust-inhibitive paint.

C. Flat Hangers: Mild steel and zinc-coated or protected with rust-inhibitive paint.

D. Studs: (non-load bearing) ASTM C 645; 20 gauge by 3-5/8", or as required for interior partitions and column enclosures; ASTM A 570, 33 KSI steel, G60 hot-dip galvanized coating per ASTM A 525. Note: Use heavy gauge structural studs as noted on the drawings. At door jambs use double 16-gauge studs strapped together.

E. Steel Studs for Furring Walls: Provide same material as specified for studs, 3-5/8" depth or as indicated.

F. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes due to deflection of structure above.

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

a. Blazeframe Industries.

b. Fire Trak Corp.

c. MBA Building Supplies.

d. Metal-Lite.

G. Firestop Tracks: Manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness, not less than indicated for studs and in width to accommodate depth of studs.

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

a. Blazeframe Industries.

b. CEMCO; California Expanded Metal Products Co.

c. Fire Trak Corp.

H. Steel Rigid Furring Channels: ASTM C 645, hat-shaped, depth of 7/8", and minimum 25 gauge, G 60 hot-dip galvanized coating per ASTM A 525.

I. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 525 or ASTM A 568 to form1/2" deep channel with single-Leg Configuration, asymmetric-shaped channel with face connected to a single flange by a single slotted leg (web).

J. Runners: Match studs, type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.

K. Stud System Accessories: Provide stud manufacturer's standard clips, shoes, ties, reinforcements, fasteners, and other accessories as needed for a complete stud system.

L. Runner: J-Type for floor ceiling support of studs.

2.3 ACCESSORY MATERIALS

A. Metal Backer Plates: Provide 20-gauge metal plate, 6" wide or as indicated on drawings, in lengths required.

B. Drywall Sealant: At sound partitions and rated walls required to meet the ratings shown, provide non-drying, non-shrinking, non-migrating sealant recommended by the drywall manufacturer.

C. Trim Accessories: Provide trim accessories of the sizes required for the drywall applications shown and specified, fabricated from galvanized steel, rolled Zinc or plastic and other following types.

D. At external corners, provide metal/plastic corner bead with smooth rigid nose and perforated and knurled metal flanges.

E. Control Joint: Formed with vee-shaped slot per Fig. 1 in ASTM C 1047, with slot opening covered with removable strip maximum 30' o.c. VSG control joint No. 93 or equivalent.

F. Cold-Rolled Channels: #16-gauge steel, galvanized for 3/4" sizes and black asphalt painted for all other sizes.

G. Fasteners: Provide fasteners of type, material, size, corrosion resistance, holding power and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum drywall manufacturers for application indicated.

1. Type S –12, fluted tip, aluminum of 1-1/4" long, with organic-polymer coating or other corrosion-protective coating.

2. Where drywall abuts, or intersects dissimilar construction, and for protection of exposed wallboard edges around openings, provide metal casing bead trim of the following design:

3. Beaded nose with exposed flange knurled for joint treatment: USG No. 200-A or equivalent.

H. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 1-1/2 inches.

2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.

I. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1 ½" inch, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.018 inch, and depth required to fit insulation thickness indicated.

2.4 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS AND SOFFITS SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.

B. Hanger Attachments to Concrete:

1. Anchors: Capable of sustaining a load equal to 5 times that imposed as determined by ASTM E 488.

a. Type: Cast-in-place anchor, designed for attachment to concrete forms

2. Powder-Actuated Fasteners: Capable of sustaining, a load equal to 10 times that imposed as determined by ASTM E 1190.

C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch- wide flanges.

1. Depth: As indicated on Drawings.

2.5 AUXILIARY MATERIALS

A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.6 GYPSUM BOARD PRODUCTS

A. Exposed Interior Gypsum Board:

1. ASTM C 36, regular type with tapered long edges for walls and ceilings.

    a. Sheet Size: Maximum length available which will minimize end joints.

    b. Thickness: As noted.

    c. Type: Type X.

B. Moisture Resistant Gypsum Board:

1. ASTM C 630, regular type with long edges for walls, not permitted at ceilings.

    a. Sheet Size: Maximum length available which will minimize end joints.

    b. Thickness: As noted.

    c. Type: Type X.

        i. Provide at all areas to receive tile and at all sink areas. (Not resident bathrooms, spa and shower rooms)

C. Cementitious Backer Board**:** Durock by United States Gypsum or accepted equal – (bathrooms and shower rooms).

D. Exterior Gypsum Ceiling Board: ASTM C 931, 5/8" thick, Type "X", fire resistant, treated gypsum core with chemically treated fiber paper. Material shall be made specifically for exterior use on ceilings and provide extra resistance to moisture and sagging required for outdoor conditions.

2.7 JOINT TREATMENT MATERIALS

A. Interior Gypsum Board:

1. Joint Tape: Plain or perforated complying with ASTM C 475.

2. Joint Compound: Ready-mixed vinyl tape for interior use.

3. Grade: Two separate grades: one specifically for bedding tapes and filling depressions, and one for topping and sanding.

B. Exterior Joint Compound: Special moisture-resistant, chemical-hardening type.

C. High Impact Compound: As recommend by manufacturer.

2.8 ACOUSTICAL SEALANT

A. Acoustical Sealant: Paintable, non-staining, latex sealant complying with ASTM C834.

B. Manufacturer: Hilti CP506 Smoke and Acoustical Sealant or equal.

PART- 3 EXECUTION

3.1 PREPARATION AND COORDINATION

A. Install supplementary stripping, backing, blocking, and bracing, at locations required to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum board and applied finishes as indicated.

1. Provide framed openings as required for Ductwork penetrations thru walls as required.

3.2 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

E. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

F. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

1. Install two studs at each jamb strapped together. Stud shall be full height to deck above.

2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.

G. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

H. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

1. Firestop Track: Where indicated, install to maintain continuity of fire-resistance rated assembly indicated.

I. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

J. Curved Partitions:

1. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.

2. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6inches o.c.

K. Direct Furring:

1. Screw to wood framing.

2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

L. Z-Furring Members:

1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches o.c.

2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

M. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.3 INSTALLING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

D. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

E. Do not attach hangers to steel roof deck.

F. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

G. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

H. Do not connect or suspend steel framing from ducts, pipes, or conduit.

I. Fire-Resistance-Rated Assemblies:

1. Wire tie-furring channels to supports.

J. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.4 INSTALLATION OF GYPSUM BOARD

A. General Standards: In addition to compliance with GA-216, comply with manufacturer's instructions and requirements for fire-resistance ratings, whichever is most stringent.

B. Provide moisture resistant gypsum board at wall of all bathrooms, and toilet rooms, do not use on ceilings.

3.5 SINGLE LAYER APPLICATIONS

A. Ceilings:

1. Apply gypsum board with long dimension at right angles to supports with end joints located over supports. Use maximum practical length boards to minimize end joints. Stagger end joints in alternate courses of boards and locate as far away from center of ceiling as possible. Fasteners shall be spaced not more than 8" o.c. Fasten with zinc-screws.

2. Gypsum board shall be attached to steel studs in accordance with ASTM Specification C 840, except that the steel drill screws (Specification ASTM C 954) shall be spaced not more than 8" o.c. at the edges and ends, and not more than 12"o.c., in the field on the board. On exterior walls, field screwing shall be at 8" o.c. Fasten with zinc-coated screws.

3.6 SOUND RATED APPLICATIONS

A. For sound-rated construction, comply with the following:

1. Partitions: Provide continuous beads of sealant at juncture of both faces of runner with floor construction, and wherever drywall abuts dissimilar materials. Install sealant prior to installation of gypsum boards.

3.7 GYPSUM SHAFTWALL CONSTRUCTION

A. Install gypsum board shaft wall systems to comply with performance and other requirements indicated as well as with manufacturer's installation instructions and the following:

B. ASTM C 754 for installation of steel framing. Fasten face layer of shaft wall system with screws through base layer and into supports. Do not bridge building expansion joints with shaft wall system, frame both sides of joints with furring and other support as indicated.

C. Install supplementary framing, blocking, and bracing to support gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly by regular framing of gypsum board shaft wall system.

D. Where handrails are indicated for direct attachment to gypsum board shaft wall system, provide not less than 0.0341" thick by 4" wide galvanized steel reinforcement strip, accurately positioned and secured behind not less than one gypsum board face layer of 5/8" thickness.

E. At penetration in shaft wall, maintain fire resistance rating of entire shaft wall assembly by installing supplementary fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

F. Isolate shaft wall system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Comply with details shown and with manufacturer's instructions.

G. Seal gypsum board shaft walls at perimeter of each section, which abuts work, and at joints and penetration within each section. Install acoustical sealant to withstand discoloration by air pressure differential between shaft and external spaces; comply with manufacturer's instructions and ASTM C 919.

3.8 DRYWALL ACCESS DOORS

A. Install in an opening cut between two adjacent studs. The frame shall be positioned in the opening and screw attached to the studs.

3.9 DRYWALL FINISHING

A. Finish exposed drywall surfaces with joints, corners and exposed edges reinforced or trimmed as specified, and with all joints, fasteners heads, trim accessory flanges and surface defects filled with joint compound in accordance with manufacturer's recommendations for a smooth, flush surface.

B. Form true, level or plumb lines, without joints, fastener heads, flanges of trim accessories or defects visible after application of field-applied decoration.

C. Use joint tape to reinforce joints formed by tapered edges or butt ends of drywall units and at interior corners and angles. Set tape in joint compound then apply skin coat over tape in one application.

D. Where open spaces of more than 1/16" width occur between abutting drywall units, (except at control joints), prefill joints with joint compound and allow prefill to dry before application of joint tape.

E. Reinforce external corners of drywall work with corner beads.

F. Securely fasten metal corner beads as recommended by the manufacturer. Use fasteners which will be fully concealed by joint compound fill applied over flanges.

G. Edge Trim:

1. Provide specified type of metal casing bead trim. Install in single unjointed lengths wherever possible.

H. Application of Joint Compounds:

1. Allow drying time between applications of joint compound in accordance with manufacturer's recommendations for the relative humidity and temperature levels at the time of application. In no case, allow less than 24 hours drying time between applications of joint compound. Apply not less than 3 separate coats of joint compound over joints, fastener heads and metal flanges.

2. Topping coat and sanding is not required above suspended ceilings where partition/walls are shown to extend to structural deck.

3. Seal airtight all locations where pipes, ducts, conduits and other devices penetrate partitions above suspended ceiling. Seal both sides of partitions using joint treatment compounds and plastic tape as required.

4. Sealing of joints between tops of partitions that extend to metal roof deck and corrugations of metal roof deck is specified in Section 078413 “Penetration Fire Stopping”.

I. Protect gypsum sheathing that will be exposed to weather for more than one month as follows:

1. Protect cutouts, corners, and joints in the sheathing by filling with a flexible sealant or by applying tape recommended by sheathing manufacturer at the time sheathing is applied.

3.10 CLEAN-UP

A. At completion of each stage of the work, all excess materials, cuttings, scrap, etc. shall be removed from the site, and all spatters, droppings, etc., shall be cleaned up.

END OF SECTION 09 2500

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DESCRIPTION OF WORK

A. The extent of each type of tile work is shown on the drawings or herein specified including, but not necessarily limited to the following:

1. Porcelain Wall Tile.

2. Glass Tile.

3. Waterproof Membrane (Walls).

1.3 REFERENCES

A. Tile Council of America - Installation Handbook.

B. American National Standards Institute (ANSI):

1. ANSI A108 Series/A118 Series – American National Standard Specifications for Installation of Ceramic Tile.

2. ANSI A108.19 – American National Standard Specifications for Gauged Porcelain Tiles and Gauged Porcelain

3. Tile Panels/Slabs.

a. ANSI A108.20 – American National Standard Specifications for Exterior Installation of Vertical and Overhead Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Improved Modified Dry-Set Cement Mortar.

b. ANSI A137.1 – American National Standard Specifications for Ceramic Tile.

c. ANSI A137.3 – American National Standard Specifications for Gauged Porcelain Tile and Gauged Porcelain Tile

C. Panels/Slab

1. ANSI A138.1 – American National Standard Specifications for Green Squared Certification for Tiles and

D. Installation Materials.

1. ASTM International (ASTM):

    a. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

    b. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar. Jobsite mix.

    c. ASTM C150 – Standard Specification for Portland Cement. Jobsite mix.

    d. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.

2. NSI (DSDM) – Dimension Stone Design Manual; Natural Stone Institute.

3. TCNA (HB) – Handbook for Ceramic Tile, Glass, and Stone Installation; Tile Council of North America.

4. TTMAC – Specifications Guide 09 30 00 Tile Installation Manual.

5. International Organization for Standardization (ISO):

    a. ISO 13007 – Ceramic tiles – Grout and adhesives.

6. Leadership in Energy and Environmental Design (LEED®) – U.S. Green Building Council.

1.4 SUBMITTALS

A. Prior to starting work, provide Architect with a "Master Grade Certificate" stating grade, type and quantity of material and bearing signature of tile manufacturer and Contractor. Covering order shall show name of Owner, Architect, the Project and project location.

B. Installation Instructions: Manufacturer's printed instructions for each product

C. Submit 2 samples of each type, class, and color of tile required. Architect's review will be for colors, pattern, and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

D. Obtain approval of job sample submittals before delivering any products to job site.

E. Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and maintenance coatings.

G. Manufacturer's Certificates: Certify products meet or exceed specified requirements. When applicable, submit a Master Grade Certificate signed by the manufacturer and the installer certifying that products meet or exceed the specified requirements of ANSI A137.1 and/or ANSI A137.3.

1.5 QUALITY ASSURANCE

A. To ensure single-source warranty requirements and compatibility of products: Please provide cleaners, sealing and maintenance products as well as tile grout, setting materials, underlayments, additives, accessories and factory- prepared dry-set mortars from the same manufacturer.

B. Installer Qualifications:

1. Engage an experienced installer who has completed tile installations similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance. Installer to have a minimum of five years' experience.

2. Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile

3. Contractors' Association of America.

a. Installer's supervisor for the project must hold the International Masonry Institute's Foreman Certification.

b. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution

1.6 PRODUCT DELIVERY, STORAGE HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels legible and intact until time of use identifying brand name and contents. Prevent damage or contamination to materials by water, freezing, foreign matter and other causes.

B. Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing and overheating in accordance with manufacturer's instructions.

C. Do not use frozen materials unless specifically allowed by manufacturer.

D. Deliver and store materials on site at least 24 hours before work begins.

E. Provide heated and dry storage facilities on site

F. Tile cartons grade-sealed by manufacturer in accordance with TCA 137.1. Grade-seals unbroken.

G. Manufactured mortars and grouts to contain hallmarks certifying compliance with reference standards and be types recommended by tile manufacturer for application.

H. Deliver mastic grout ready for use.

I. Deliver dry-set mortar in sealed, moisture-proof containers.

1.7 ENVIRONMENTAL CONDITIONS

A. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.

B. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

C. Maintain substrate and ambient temperatures in tiled areas between 50ºF and 95ºF during installation and for at least 7 days after completion, unless otherwise indicated in the product instructions and/or ANSI A108 installation standards.

D. Provide adequate lighting for good grouting and clean-up.

E. Setting products must be kept in a dry area prior to use.

PART- 2 PRODUCTS

2.1 PORCELAIN

A. CT-1 Bespoke Collection, Stacked Celestine, Silver Polished Glass Mosaic.

1. Size: 2” x 6” (12” x 12” sheet)

2. Grout Joint: 1/16”

2.2 ADHESIVE

A. Walls: Laticrete or equal, Glass Tile Adhesive Lite.

2.3 SEALANT

A. Walls: Sanitary 1700 Sealant by General Electric or accepted equal. One part mildew resistant silicone sealant. Color as selected by Architect.

2.4 COLORED GROUT

A. Colored grout shall be as manufactured by Laticrete International, Inc., or approved equivalent. Color selected by Architect.

B. “SpectraLoc” Pro Premium or “SpectraLoc” Pro Premium Translucent Grout as chosen by Architect.

2.5 EDGE BAND

A. As manufactured by Schluter Systems, Interior Finish Schedule.

1. Outside Corner: RONDEC

2. Cap: RONDEC

2.6 ACCESSORIES

A. Temporary Setting Shims: Ridged plastic shims, size to suit joint thickness.

B. Setting Shims: Strips of resilient plastic or neoprene, of thickness to prevent point loading of stone on anchors and of depths to suit anchors without intruding into required depths of pointing materials.

C. Cleaner: Cleaner specifically formulated for tile types, finishes, and applications indicated, as recommended by tile producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.

PART- 3 EXECUTION

3.1 PREPARATION

A. Beginning work on any surface constitutes acceptance of the surface as suitable to receive work of this section and acceptance of full responsibility for the quality and appearance of finished work.

B. Do not start until work of other trades, which goes through or in the space behind tile, has been completed.

C. Examine substrates for compliance with requirements for conditions affecting performance of the work. Refer to ANSI A108.01, ANSI A108.02 and if applicable ANSI A108.19 and/or ANSI A108.20. This includes, but is not limited to squareness and plumbness of walls and variations in floor.

D. Do not proceed with tilework until surfaces and conditions comply with requirements indicated in reference tile installation standard and manufacturer's printed instructions

E. Work shall not be started on concrete surfaces until surfaces are thoroughly cured and dry.

F. Surfaces to receive thin-bed mortar shall not vary more than 1/8" above and 1/8" below required plane in any undivided space; nor shall there be more than 1/16" variation within any single running foot.

1. Cementious Backer Board Substrate:

    a. Verify board fastening at 8 inches on center with screws firmly anchored into stud backing.

    b. All horizontal and vertical joints and corners are to have 1/8 inch spacing to be filled solid with mortar. Apply 2-inch glass fiber mesh tape embedded in a skim coat of the motor at all joints and corners.

2. Expansion Joints:

    a. Notify Architect if concrete slab expansion joints are located within work areas. Install tile at expansion joints in conformance with TCA EJ171.

G. Close off spaces in which tile is being set to traffic and other work during installation and for at least 72 hours after completion of tile work.

H. Floor tile operations in spaces receiving wall tile shall not be started until after wall tile installation has been completed.

I. Before installing base tile, seal areas around pipes penetrating the backing material. Sealer used shall be compatible with material which will be used to install the tile.

3.2 WORKMANSHIP

A. All tile shall be installed by skilled mechanics thoroughly competent to execute the work in accordance with best practices and methods common to the trade and in accordance with Tile Council of America “Handbook for Ceramic Tile Installation”, latest edition.

B. Accurate pitch of setting bed to floor drains to be maintained.

C. Porcelain tile shall be set with constant 1/8" joints. Marble shall be set at 1/16” joints. Adjust factory mounted tile as required to align joints squarely Tile shall be firmly secured in place in straight lines and level plans. The finished work shall be free from scratched, broken, inverted, cracked, or misplaced tiles.

D. Grind and fit tile carefully at intersections, against trim finish, and at built-in fixtures and accessories. Fit tile closely around outlets, pipes, fixtures, and fittings so that plates, escutcheons and collars will overlap cuts. Cut and drill tile and trim shapes accurately without damage. Rub all exposed cut edges smooth with abrasive stone.

E. Layout shall be symmetrical at all spaces and preclude the use of less than half tile sizes. Tile shall accurately align in all directions, vertically and horizontally, and shall be flush throughout the field.

F. Except where otherwise shown or specified, make joints in floor tile perpendicular and parallel to walls.

G. Prevent rapid evaporation of moisture from the mortar bed. Do not set tile on dry bed.

3.3 APPLICATION

A. Install tile in accordance with manufacturer's printed instructions and the applicable requirements of ANSI A108 Series for the materials being used.

B. Protect surrounding finish materials during application of waterproofing. Clean spillage's immediately with solvent recommended by manufacturer and flush with clear water.

C. For installation on existing wall tile, verify existing tile is soundly secured to wall. If needed removed loose tile and fill with mortar filler. Degrease existing tile before installing new tile.

D. Install all floor, wall and base tile in strict accordance with ANSI specifications for the particular applications scheduled on the drawings. Comply with manufacturer instructions.

E. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignments.

F. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collards or covers overlap tiles,

1. Jointing pattern:

    a. Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on the floor, base, walls, and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting.

2. Sealant:

    a. Seal junction of plumbing fixtures, exposed pipe penetrations, fitting and expansion joints with sealant after grouting.

3. Trim:

    a. Install metal cap trim on wainscot tile wall as recommended by manufacturer. All corners shall be mitered.

3.4 GROUTING

A. Grout joints in accordance with manufacturer's instructions and ANSI A108.6 and/or ANSI A108.10.

B. Remove standing water, dust, and foreign substances from joints to be grouted

C. Clean and dry tile surfaces.

D. After grouting, remove all grout residue promptly.

E. Dry-set grout may be applied over dry tile without wetting of tile. Grout for floors shall be, color to be selected by Owner. Factory premixed colored grouts may be used. Colored grout for walls shall be as selected by Architect.

1. Allow mortar to attain initial set before placing joint grout.

2. Before grout is set, strike or tool joints to depth of cushion.

3. Fill all gaps and skips.

4. Clean excess grout from all surfaces before grout sets.

3.5 CURING AND CLEANING

A. Floors shall be covered with waterproof paper with all joints lapped at least 4" and the laps tape-sealed or held down with planks or weights and allowed to damp cure for at least 72 hours before foot traffic is permitted thereon.

B. Sponge and wash all tile thoroughly. Acid or acid type cleaners not permitted.

C. Tile which is stained, broken or damaged in any way is not acceptable and must be replaced.

D. Upon completion of all work, tile contractor shall remove all unused material and rubbish from the site.

3.6 PROTECTION

A. Floors: Protect from all traffic for at least 72 hours after installation.

1. Do not step on floor for at least 24 hours; if traffic is unavoidable after that, use plywood stepping boards.

2. Protect from heavy traffic for at least 7 days after installation.

3. When fast-setting materials are used to allow faster occupancy, comply with the manufacturer's recommendations.

B. Protect from impact, vibration and heavy hammering on adjacent and opposite walls for at least 14 days after installation, unless manufacturer’s instructions allow a shorter period.

C. Protect from stain-causing food products and chemicals for at least 14 days.

D. Tiled vertical outside corners (external angles) shall be protected with board corner strips in areas used as passageways by workmen.

E. Protect tile work from damage until project completion or acceptance.

END OF SECTION 09 3000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DESCRIPTION OF WORK

A. The types of acoustical panel ceilings specified in this section includes, but is not limited to, the following:

1. Suspended mineral fiber panel systems.
2. Exposed grid suspension system for acoustical ceilings
3. Grid suspension systems for gypsum board ceilings and soffits
4. Wire hangers, fasteners, main runners, cross tees and wall angle moldings
5. Perimeter trim

1.3 QUALITY ASSURANCE

A. Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated UL design assemblies as shown on drawings.

B. Surface Burning Characteristics: As follows, tested per ASTM E 84.

1. Flame Spread: 25 or less.
2. Smoke Developed: 50 or less.

C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any). Reflected ceiling plans may vary due to variations in room size. Contractor's bid shall include all such variations.

D. Single source responsibility: Provide acoustical panel units, grid components, and trim by a single manufacturer.

1.4 SUBMITTALS

A. For information only, submit 2 copies of manufacturer's product specifications and installation instructions for each acoustical ceiling material required, and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications. Distribute one additional copy of each installation instruction to the Installer.

B. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods, which may be detrimental to finishes and acoustical performances.

C. Submit 2 sets of 6" square samples for each acoustical unit required. In each set of samples, show the full range of exposed color and texture to be expected in the completed work. Sample submittal and Architect's review will be for color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.

D. When work is completed, deliver stock of replacement material to Owner for each type of acoustical unit used in the work. Furnish full size units, matching installed materials, packaged and marked for identification. Furnish not less than two cases of each type of acoustical unit installed.

1.5 WARRANTY

A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include but are not limited to:

1. Acoustical Panels: Sagging and warping as a result of defects in materials or factor workmanship.

2. Grid System: Rusting and manufacturer’s defects.

3. Acoustical Panels with BioBlock Plus or designated as inherently resistive to the growth of micro-organisms installed with Armstrong suspension systems: Visible sag and will resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.

B. Warranty Period Humiguard:

1. Acoustical panels: Ten (10) years from date of substantial completion.

2. Grid: Ten (10) years from date of substantial completion.

3. Acoustical panels and grid systems with HumiGuard Plus or HumiGuard Max performance supplied by one source manufacturer is thirty (30) years from date of substantial completion.

C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.6 PRODUCT HANDLING

A. Deliver acoustical panels in manufacturer's original unopened packages, fully identified with type, finish, performance data and compliance labels. Handle and store in accordance with manufacturer's instructions and recommendations.

1.7 JOB CONDITIONS

A. Do not install acoustical units until installation areas meet the following requirements: exterior openings have been closed and roofs are weathertight; mechanical, electrical, and other work above ceilings have been completed; wet work has been installed; temperature and relative humidity have reached levels which comply with acoustic materials manufacturer's recommendations for the units to be used and are acceptable to the Installer.

B. Coordinate all work with Mechanical and Electrical trades. Prior to layout work, it shall be the responsibility of the Contractor to meet with the General Contractor and Electrical Contractor to properly coordinate the installation of the ceiling and electrical fixtures.

C. Examine related sections of these specifications for hangers, inserts, etc. provided under those sections.

D. Suspension system shall be coordinated with metal stud and/or demountable partitions. Bracing, etc., required for stiffening of partition system shall be provided by this Contractor.

1.8 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish new extra materials described below that match products installed. Package with protective covering for storage and identified with appropriate labels.

1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 1 percent of the amount installed.

2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

1.9 ALTERNATE CONSTRUCTION WASTE DISPOSAL

A. Ceiling material being reclaimed must be kept dry and free from debris.

B. Contact the Armstrong Recycle Center a consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant will provide assistance to facilitate the recycling of the ceiling.

PART- 2 PRODUCTS

2.1 MATERIALS – GENERAL

A. The following specified acoustical materials shall have the minimum requirements listed below, in addition to the requirements of the "Quality Assurance" Section.

B. Examine related sections of these specifications for hangers, inserts, etc. provided under those sections.

C. Suspension system shall be coordinated with metal stud and/or demountable partitions. Bracing, etc., required for stiffening of partition system shall be provided by this Contractor.

2.2 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials (1% of amount installed), packaged with protective covering for storage and identified with appropriate labels.

2.3 ACOUSTICAL

A. The following specified acoustical materials shall have the minimum requirements listed below, in addition to the requirements of Quality Assurance Section.

1. NRC: .55
2. CAC 40
3. CSTC: 35
4. L.R.: 75%
5. Flame Spread - 0 -25, Class A per ASTM E 1264.

2.4 CEILING MATERIALS

A. Basis of Design Product: Subject to compliance with requirements, provide products as indicated by Armstrong World Industries, Inc. or an equal product by one of the following:

1. Armstrong World Industries
2. Celotex Corporation
3. USG Corporation

B. Except at noted, the materials as manufactured by Armstrong World Industries are specified. Equal patterns and textures furnished by one of the above companies will be considered.

2.5 CEILING TYPES

A. Provide units of the composition, patterns, finishes, sizes, thickness, edge profiles and other characteristics as indicated and recommended by the manufacturer for the indicated application. Tile must comply with UL design systems as previously noted. The manufacturer based Armstrong ceiling solutions or equal.

1. A.C.T. 1

    a. Tile: Tectum DesignArt - Lines, 24" X 24" X 1".
    b. Suspension System: 15/16" – Square Tegular #7301 with Angle molding #7800 to match.
    c. Color as chosen by Architect from manufacturer's full range of colors.
    d. Grid to be color matched.

B. Armstrong Contact: Lynda Caccamo (315) 399-8257 - lmcaccamo@amstrongceilings.com

2.6 SUSPENSION SYSTEM MATERIALS – GENERAL

A. Acceptable Manufacturers: Materials of the following manufacturers are acceptable where applicable:

1. Armstrong World Industries or Equal.

B. Except as noted, the materials as manufactured by Armstrong World Industries are specified. Equal grid system furnished by one of the above companies will be acceptable, provide it is a component complying with the UL design system previously noted.

C. Standard: Comply with the requirements of ASTM C 635, as applicable to the suspended acoustical ceilings system materials indicated. Provide fire-rated system throughout.

D. Structural Classification: Intermediate-duty system.

E. Coordination of Components

1. Provide suspension system which is coordinated with partitions, and which is coordinated with the indicated limitations and requirements for hanging from structure and supporting light fixtures,

2. HVAC components and similar work indicated to be supported by or located in suspended acoustical panel ceilings. Include the necessary components for a complete suspension system including (as applicable) inserts, anchors, hangers, carrying channels, main runners, cross runners, splines, edge moldings, splices, clips, fasteners, springs, tie wires, hold-down devices, and similar members, devices and accessories.

F. Corrosion Protection: Electro galvanized steel meeting requirements of ASTM C 635 for normal use environments.

G. Attachment Devices: Type recommended by suspension system manufacturer for attachment or anchorage of ceiling hangers to structure above ceiling, sized for not less than 5-times the hanger design load for the structural classification indicated; ASTM C 635, Table 1, Direct Hung.

H. Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating.

I. Gauge: Provide wire sized so that stress at 5-times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 12 gauge (0.106") wire.

2.7 RUNNERS, CROSS RUNNERS EDGE MOLDINGS AND TRIM

A. General: Except as otherwise indicated, provide manufacturer's standard units of the metal, finish and shapes recommended for the applications indicated.

B. Type of System: Either direct-hung or indirect-hung suspension system, at Contractor's option.

C. Exposure of System: Provide fully exposed suspension system (for lay-in panels), with lower flanges of both main runners and cross runners exposed.

D. Finish of Exposed Members: Provide uniform white matte baked enamel factory-applied finish on exposed surfaces of ceiling suspension system including moldings, trim and accessories.

E. Edge Molding: Square Edge or shadow as noted in ceiling types.

F. Trim: Armstrong Ceiling Systems, Axiom trim profiles or equal. Provide Axiom Classic and Vector trim rails with all required accessories.

2.8 TECTUM PANELS

A. Panels mechanically attached to steel framing shall be installed per manufactures installation instructions.

B. Panels shall be installed in an ashlar pattern. Whenever panel a buts another panel, edge shall be beveled.

C. Screens shall be as defined in manufactures installation instructions. Screw head should be flush with surface.

D. Paint screw head prior to installation to match natural finish.

2.9 MISCELLANEOUS MATERIALS

A. Trapeze: Cold rolled steel channels, 16 MSG, 1-1/2".

PART- 3 EXECUTION

3.1 INSPECTION AND PREPARATION WORK

A. Examine the conditions under which the acoustical panel ceiling work is to be performed. Do not proceed with the work until satisfactory conditions have been corrected.

B. Plan each layout to balance border widths at opposite edges of each ceiling area. Avoid use of less-than-half width units wherever possible. Comply with Architect's reflected ceiling plans to the greatest extent possible.

3.2 INSTALLATION

A. Install acoustical tile ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

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

C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, counterplaying, or equally effective means. Where widths of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices.

1. Do not support ceilings directly from permanent metal forms or floor deck; anchor into concrete slabs.

2. Do not attach hangers to steel deck tabs or steel roof deck.

D. Install edge moldings and trim at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical units. Screw attached moldings to substrate with concealed fasteners at intervals not more than 16 inches o.c. and not more than three inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

E. Lighting fixtures shall be installed according to reflected ceiling plans. All lighting fixtures shall have hanger wires at each corner. Provide rated enclosure for fixtures.

F. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

G. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile. Where reveal edge tile meets border, kerf tile to provide recess. Where cut edge is exposed, paint to match tile. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches o.c.

3.3 CLEANING AND PROTECTION

A. Clean exposed surfaces of acoustical panels, trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work, which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 5100

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Divsion-1 Specification sections, apply to work of this section.

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes:

1. Resilient Wall Base.

1.3 SUBMITTALS

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

B. LEED Submittals:

1. Product Data for Credit EQ 4.1: For adhesives, include printed statement of VOC content and chemical components.

C. Samples for Initial Selection: For each type of product indicated.

D. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.

E. Product Schedule: For resilient products. Use same designations indicated on Drawings**.**

1.4 QUALITY ASSURANCE

A. Installation Qualification: Contractors for floor covering installation should be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified. An installer is “qualified” if trained, or a certified by Tarkett or a certified INSTALL (International Standards & Training Alliance) resilient floor covering installer.

B. Mockups: Provide resilient products with mockups specified in other Sections.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Tarkett, but not less than 55 deg F or more than 85 deg F.

1.6 PROJECT CONDITIONS

A. Install resilient products after other finishing operations, including painting, have been completed.

B. Maintain ambient temperatures within range recommended by Tarkett, but not less than 65 deg F or more than 85 deg F in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.

2. During installation.

3. 48 hours after installation.

C. Maintain the ambient relative humidity between 40% and 60% during installation.

D. Until Substantial Completion, maintain ambient temperatures within range recommended by Tarkett, but not less than 55 deg F or more than 85 deg F.

PART- 2 PRODUCTS

2.1 RESILIENT WALL BASE

A. Provide vinyl base complying with FS SS-W-40, Type II, as follows:

1. Manufacturers:

a. Johnsonite

b. Burke Flooring

2.2 RESILIENT TRADITIONAL VINYL WALL BASE (VB-1)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite – Millwork plastic Vinyl Wall Base.

B. Performance requirements meets ASTM F1861 Standard Specification for Resilient Vinyl Wall Base, Type TV, Group 1.

C. Height: 4 1/4”

D. Thickness: .25”

E. Style: Reveal MW-XX-F

F. Colors and Patterns: As selected by Architect from full range of industry colors.

G. Test Data:

1. Flexibility, ASTM F137: Passes 1/4 inch mandrel

2. Resistance to light, ASTM F1515: Passes

3. Resistance to chemicals, ASTM F925: Passes

4. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm^2 or greater, Class 1.

2.3 RESILIENT TRADITIONAL VINYL WALL BASE (VB-1)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite plastic Vinyl Wall Base.

B. Performance requirements meets ASTM F1861 Standard Specification for Resilient Vinyl Wall Base, Type TV, Group 1.

C. Height: 4”.

D. Length: Roll - 120’ long.

E. Thickness: 1/8” gauge.

F. Style: Standard top-set cove

G. Colors and Patterns: As selected by Architect from full range of industry colors.

H. Test Data:

1. Flexibility, ASTM F137: Passes 1/4 inch mandrel

2. Resistance to light, ASTM F1515: Passes

3. Resistance to chemicals, ASTM F925: Passes

4. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm^2 or greater, Class 1.

2.4 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.5 INSTALLATION MATERIALS

A. Adhesives: as recommended by Tarkett to meet site conditions

1. Tarkett 960 Cove Base Adhesive (Porous applications)

2. Tarkett 946 Premium Contact Bond Adhesive (Non-porous applications)

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

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

3.2 PREPARATION

A. Prepare substrates according to Tarkett's written instructions to ensure adhesion of resilient wall base.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

C. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

D. Vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Comply with Tarkett's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

3.4 CLEANING AND PROTECTION

A. Comply with Tarkett's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 09 6513

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This section includes the following Linoleum Modular Flooring:

1. Marmoleum® Modular Striato

B. Sections related to this section include:

1. Concrete: Refer to Division 3 Concrete Sections for cast-in-place concrete, concrete toppings, and cementitious underlayments.

2. Resilient Flooring Accessories: Refer to Division 9 Finishes Sections for resilient wall bases, reducer strips, metal edge strips and other resilient flooring accessories.

1.3 REFERENCES

A. Forbo Technical Data Sheets

B. Forbo Installation Guide

C. Forbo Floor Care Guide

D. Safety Data Sheets (MSDS or SDS)

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

1. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials

2. ASTM E 492 – Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine

3. ASTM E 648 – Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

4. ASTM E 662 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

5. ASTM E 989 – Standard Classification for Determination of Impact Insulation Class (IIC)

6. ASTM E 1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs

7. ASTM F 141 – Standard Terminology Relating to Resilient Floor Coverings

8. ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

9. ASTM F 1482 – Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring

10. ASTM F 1861 – Standard Specification for Resilient Wall Base

11. ASTM F 1869 – Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

12. ASTM F 2195 – Standard Specification for Linoleum Tile Floor Covering

13. ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

14. ASTM F 2419 – Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring

15. ASTM F 2471 – Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring

16. ASTM F 2659 – Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and other Floor Slabs and Screeds Using a Non- Destructive Electronic Moisture Meter

17. ASTM F 2678 – Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring

18. ASTM F 3191 – Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring

F. National Fire Protection Association (NFPA):

1. NFPA 253 – Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

2. NFPA 258 – Test Method for Specific Optical Density of Smoke Generated by Solid Materials

1.4 SUBMITTALS

A. Submit the following in accordance with conditions of contract and Division1 specification section 01 3300 “Submittal Procedures”.

B. Product Data: Submit three (3) copies of the manufacturer’s technical data and installation recommendations for each type of flooring and accessory products specified.

C. Shop Drawings:

1. Submit shop drawings showing layout, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

2. Show details of profiles and product components, including anchorage, accessories, finish colors, patterns and textures.

D. Samples: Submit three (3) sets of samples of each type, color and finish of flooring and accessory products specified, with an indication of full range of color, pattern and texture variation. Provide samples with a minimum size of 6" x 9" for flooring products and 6" in length for accessories.

E. Quality Assurance Submittals:

1. Submit three (3) copies of the manufacturer's Product Technical Data Sheet, specifying performance characteristics, criteria and physical requirements.

2. Submit three (3) copies of the manufacturer's written installation recommendations.

F. Closeout Submittals:

1. Submit three (3) copies of the maintenance and operations data. This should include methods for maintaining the installed products and any precautions against cleaning materials or methods that are detrimental to the product and their performance.

2. Submit three (3) copies of the warranty as specified herein.

3. Installer Certification: Submit proof of certification from the manufacturer certifying that the installers comply with the specified requirements.

G. Replacement Material: After completion of work, deliver to project site replacement materials from the same manufactured lot as materials installed. Package materials with protective covering and identify each with descriptive labels.

1. Flooring Materials: No less than 50 square feet of each type, pattern and color installed.

2. Accessories: No less than 10 linear feet for each 500 linear feet or fraction thereof each different type and color installed.

1.5 QUALITY ASSURANCE

A. Manufacturer: Whenever possible, provide each type of flooring as provided by a single manufacturer, including recommended primers, adhesives, sealants, patching and leveling compounds.

B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation and floor care recommendations and manufacturer's warranty requirements. Comply with requirements according to the "Project Management and Coordination" in Division 1 Project Meetings Section.

C. Pre-Installation Testing: Conduct and document pre-installation testing as specified by manufacturer in accordance with the latest version of the specified test methods.

1. Substrate Porosity Testing: ASTM F 3131 – Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring.

2. pH testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

3. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

4. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

5. Surface Moisture Testing: ASTM F 2659 – Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and other Floor Slabs and Screeds Using a Non-Destructive Electronic Moisture Meter.

6. Bond Testing: Conduct testing and document results in accordance with the manufacturer's recommendations.

D. Flooring Contractor Qualifications:

1. The awarded flooring contractor shall be an established firm, experienced in the installation of the specified product and shall have access to all manufacturer's required specifications, technical, installation and maintenance related documents.

E. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

1. Engage installers certified by Forbo as a "Forbo Certified Modular Technician."

2. Proof of valid certification must be submitted to the General Contractor and verified by Forbo prior to the start of the project.

3. Forbo Certified Modular Technicians must be present on the jobsite daily.

F. Regulatory Requirements: Provide flooring products with the following fire performance characteristics as determined by testing identical products in accordance with the latest version of ASTM method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. ASTM E 648 – Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source or NFPA 253 – Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.

2. ASTM E 662 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials or NFPA 258 – Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

G. Standard of Quality Mock-Up: For the purpose of evaluating the quality of workmanship, install a mock-up of the specified flooring completed by the pre-qualified installers following the manufacturer's installation recommendations. Obtain Owner's and Architect's acceptance of finish color, texture and pattern, and workmanship standard. Comply with requirements according to the "Quality Control" in Division 1 Mock-Up Requirements Section.

1. Size and Location of Mock-Up: As directed in field by Owner and Architect.

2. Maintenance of Mock-Up: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

3. Approval of Mock-Up: Upon approval of the mock-up, this installation shall be considered the standard of quality and basis of comparison for the balance of the project. Areas to be found deficient by specification standards or application procedures shall be repaired or replaced at the contractor's expense.

4. Incorporation of Mock-Up: The mock-up may be incorporated into final construction upon Owner's approval.

H. Post-Installation Meetings: Conduct post-installation meetings to review methods and procedures related to floor care and warranty requirement.

1.6 WARRANTY

A. Project Warranty: Comply with requirements according to the "Conditions of the Contract" in Division 1 Closeout Submittals Warranty Section for project warranty provisions.

B. Manufacturer's Warranty: Submit the manufacturer's standard warranty document executed by authorized company official for Owner's acceptance. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1. Warranty Period: Thirty (30) year limited warranty commencing on Date of Original Purchase from manufacturer.

C. Installation Warranty: Submit the flooring contractor's installation warranty signed by the General Contractor and Installer for Owner's Acceptance, agreeing to repair or replace work which has failed a as result of defects in workmanship. Failure shall include, but not limited to, tearing, cracking, separation, deterioration or loosening from substrate, seam failure, ripples, bubbling or puckering. Upon notification of such installation deficiencies, within the warranty period, make necessary repairs or replacement at the convenience of the Owner. Other guaranties or warranties may not be substituted by the Contractor for the terms of this warranty. Installation warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents

1. Warranty Period: Two (2) year limited warranty commencing on Date of Substantial Completion from flooring contractor.

1.7 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with the Division 1 Product Requirements Sections.

B. Ordering: Comply with the manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

1. All materials (flooring, adhesives, weld rod and accessories) should be stored in areas that are fully enclosed and weathertight. The permanent HVAC should be fully operational and controlled and set at a minimum temperature 65° F. If this is not possible, the areas should be acclimated and controlled by means of temporary HVAC to the service level conditions expected during occupancy. The temperature and humidity should range from 75° F ± 10°F with a 50% ± 10% ambient relative humidity.

2. Store modular cartons stacked per the manufacturer's recommendations.

3. Comply with the manufacturer's recommendation for the acclimation of all materials in the space where they will be installed for at least 48 hours prior to the installation unless longer conditioning periods are required by the manufacturer.

1.8 PROJECT CONDITIONS

A. Environmental Requirements/Conditions:

1. Areas to receive material should be clean, fully enclosed and weather tight. The permanent HVAC should be fully operational and controlled and set at a minimum temperature 65° F. If this is not possible, the areas should be acclimated and controlled by means of temporary HVAC to the service level conditions expected during occupancy. The temperature and humidity should range from 75° F ± 10°F with a 50% ± 10% ambient relative humidity. These conditions **MUST** be established at least seven days prior to beginning the installation, maintained during the installation, and continued for at least seven days following the installation.

2. The flooring material should be conditioned in the same manner for at least 48 hours prior to the installation.

3. Substrate evaluation and preparation should not begin until a stable, conditioned environment has been established as described in this section.

4. Areas to receive flooring must have adequate lighting to allow for proper inspection and preparation of the substrate, installation of the flooring and final inspection.

B. Temperature Requirements: Maintain air temperature in spaces where products will be installed for time period before, during, and after installation as recommended by manufacturer.

1. Temperature Conditions: 65° F for at least seven days prior to beginning the installation, maintained during the installation, and continued for at least seven days following the installation.

C. Substrate Conditions:

1. Existing Conditions.

2. Concrete Curing: Do not install flooring over concrete substrates until substrates have cured and are dry to bond with adhesive as determined by the concrete and flooring manufacturer's recommendations.

3. Testing Results: Conduct and document pre-installation testing as specified by manufacturer in accordance with the latest version of the specified test methods.

a. Substrate Porosity Testing: ASTM F 3131 – Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring.

b. pH testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

c. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

d. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

e. Surface Moisture Testing: ASTM F 2659 – Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and other Floor Slabs and Screeds Using a Non- Destructive Electronic Moisture Meter.

f. Bond Testing: Conduct testing and document results in accordance with the manufacturer's recommendations.

4. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by the manufacturer.

5. Installation should not begin until the work of all other trades has been completed, especially overhead trades.

6. Where demountable partitions and other items are indicated for installation on top of flooring material, install flooring material before these items are installed.

D. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

PART- 2 PRODUCTS

2.1 LINOLEUM MODULAR FLOORING

A. Basis of Design:

1. FORBO - Marmoleum® Modular Striato
US Headquarters
8 Maplewood Dr.
Hazleton, PA 18202
Phone: 1-800-842-7839
www.forboflooringNA.com]

2. Substitution requests shall be considered in accordance with contract provisions.

2.2 MATERIALS

A. Material Name: Marmoleum® Modular Striato

1. Description: Homogeneous linoleum tile made primarily of natural materials consisting of linseed oil, wood flour, and rosin binders, mixed and calendared onto a polyester backing. Pattern and color shall extend throughout total thickness of material.

2. Finish: Topshield2™ applied during the manufacturing process

3. Size: Match Existing

4. Gauge: 2.5mm (1/10")

5. Backing: Polyester

6. Color and Pattern: Colors and patterns shall be selected by Architect. Patterns shall be defined in any given area, applied in stripes, diagonals, checkerboard pattern and other designs as determined by the

Architect. All selections shall be made from the manufacturer's full product lines (including premium colors).

a. Existing: Marmoleum Striato, Rocky Ice #T5232.

B. Adhesive: Forbo T 940 Adhesive or as recommended by manufacturer.

2.3 ACCESSORIES

A. Resilient Edge Strips: Strips shall be homogeneous vinyl or rubber composition with a tapered or bull nose edge no less than 1" wide, colored to match flooring or as selected by Architect from standard colors available.

B. Metal Edge Strips: Strips shall be of width shown and of required thickness to protect the exposed edge of the flooring with units in maximum length available to minimize the number of joints.

C. Floor Care Products: Provide products as required in Section 3.7 Cleaning.

2.4 SOURCE QUALITY

A. Source Quality: Obtain flooring product materials from a single manufacturer.

PART- 3 EXECUTION

3.1 MANUFACTURER'S RECOMMENDATIONS

A. Compliance: Comply with manufacturer's product technical data, including product technical bulletins, installation recommendations and floor care recommendations.

3.2 INSPECTION

A. Site Verification of Conditions: The Flooring Contractor and Installer shall examine and verify conditions previously described in other sections under which flooring and accessories are to be installed to be in accordance with the manufacturer's installation recommendations and must notify the General Contractor in writing of conditions detrimental to proper and timely completion of work. Work shall not proceed until all unsatisfactory conditions are corrected to acceptable conditions to the Owner and Architect.

B. Material Inspection: Visually inspect all materials prior to installation in accordance with the manufacturer's installation recommendations. Material with visual defects shall not be installed and shall not be considered as a legitimate claim if they are installed.

3.3 PREPARATION

A. General: Comply with manufacturer's written installation recommendations for preparing substrates indicated to receive flooring products and accessories.

B. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

C. Surface Preparation:

1. General: Prepare substrate in accordance with manufacturer's recommendations and ASTM industry standards. Work shall not proceed until all unsatisfactory conditions are corrected to acceptable conditions to the Owner and Architect.

2. Substrate: Substrates to receive flooring must be structurally sound, rigid, smooth, flat, clean, and permanently dry. The substrates must be free of all foreign materials including, but not limited to, dust, solvent, paint, wax, oils, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitance, mold, mildew, and other foreign materials that might affect the rate of moisture dissipation from the concrete, the adhesion of flooring to the concrete or cause a discoloration of the flooring from below.

3. Concrete Substrates: Concrete substrates shall be cured per the concrete manufacturer's recommendations. They must have a minimum compressive strength of 3,000 psi and a minimum dry density of 150 pounds per cubic foot. Refer to Division 3 Concrete Sections for patching, repairing crack materials and leveling compounds with Portland cement-based compounds.

    a. Refer to Division 3 Concrete Sections for cast-in-place concrete, concrete toppings, and cementitious underlayments.

    b. Reference Standard: Comply with the latest version of ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

D. Wood Substrates: Wood substrates must be double construction with a minimum total thickness of 1 inch. Wood substrates must be rigid, free from movement and have at least 18" of well-ventilated air space below. Forbo products should not be installed over wooden subfloors built on sleepers over on or below grade concrete floors without first making sure that adequate precautions have been taken to ensure the structural integrity of the system, and to prevent moisture migration from the concrete slab.

1. Refer to Division 6 Carpentry Section for wood substrates and wood underlayment.

2. Reference Standard: Comply with the latest version of ASTM F 1482 – Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.

E. Substrate Testing: In order to ensure that the moisture condition of concrete substrates is within acceptable limits, it is essential that moisture testing be conducted and documented on ALL concrete substrates regardless of age or grade level, including those where resilient flooring has already been installed. Moisture testing should only be conducted once a stable, conditioned environment has been established in accordance with the latest version of the specified test methods. All other testing types shall be conducted on all substrate types. A diagram of the area showing the location and results of each test should be submitted to the Architect, General Contractor or End User. If at the time of testing the test results exceed the limitations set forth by the flooring manufacturer, the installation must not proceed until the problem has been corrected. The Contractor responsible for the substrate shall be responsible for the costs associated with analysis of the substrate and subsequent remediation requirements.

1. Surface Moisture Testing: ASTM F 2659 – Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and other Floor Slabs and Screeds Using a Non-Destructive Electronic Moisture Meter.

    a. Conduct testing at each calcium chloride test location as the calcium chloride test is being placed.

b. The concrete surface must be dry and have a value of 5 or less when using Forbo Sustain 1299 adhesive.

2. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

    a. Conduct three (3) tests for the first 1,000 square feet (100 square meters) and at least one additional test for each additional 1,000 square feet (100 square meters).

    b. The concrete internal relative humidity must not exceed 75% when using Forbo T 940 adhesive.

    c. The concrete internal relative humidity must not exceed 85% when using Forbo Sustain 885m adhesive.

    d. The concrete internal relative humidity must not exceed 95% when using Forbo Sustain 1195 adhesive.

    e. The concrete internal relative humidity must not exceed 95% when using Forbo Sustain 1299 adhesive.

    f. The concrete internal relative humidity must not exceed 80% when using Forbo 660 adhesive.

3. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

    a. Conduct three (3) tests for the first 1,000 square feet (100 square meters) and at least one additional test for each additional 1,000 square feet (100 square meters).

    b. The concrete moisture vapor emissions must not exceed 5.0 lbs. per 1,000 square feet in 24 hours when using Forbo T 940 adhesive.

    c. The concrete moisture vapor emissions must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo Sustain 885m adhesive.

    d. The concrete moisture vapor emissions must not exceed 10.0 lbs. per 1,000 square feet in 24 hours when using Forbo Sustain 1195 adhesive.

    e. The concrete moisture vapor emissions must not exceed 6.0 lbs. per 1,000 square feet in 24 hours when using Forbo 660 adhesive.

4. Substrate Porosity Testing: ASTM F 3131 – Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring.

    a. Conduct testing in accordance with the manufacturer's recommendations in various locations throughout the area where flooring is to be installed. Although the number of tests required may vary, enough tests should be performed to allow an evaluation of the entire area where material will be installed.

    b. Water should penetrate into the substrate within 5 – 20 minutes to be considered acceptable. If water penetrates too rapidly or too slowly, adjustments to the substrate must be made to provide the proper surface profile. Substrates determined to be overly porous, dusty or generally insufficient may need to be primed using a primer according to the manufacturer's recommendations to regulate the porosity level of the substrate.

5. pH testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

    a. Conduct testing at each calcium chloride test location as the calcium chloride tests are removed.

    b. The surface pH of the concrete must not exceed a pH of 10.0 when using Forbo [T 940] [Sustain 885m] adhesive. Concrete surfaces with pH readings less than 7.0 or above 10.0 will require remediation prior to installation.

    c. The surface pH of the concrete must not exceed a pH of 11.0 when using Forbo Sustain 1195 adhesive. Concrete surfaces with pH readings less than 7.0 or above 11.0 will require remediation prior to installation.

    d. The surface pH of the concrete must not exceed a pH of 12.0 when using Forbo Sustain 1299 adhesive. Concrete surfaces with pH readings less than 8.0 or above 12.0 will require remediation prior to installation.

    e. The surface pH of the concrete must not exceed a pH of 9.0 when using Forbo 660 adhesive. Concrete surfaces with pH readings less than 7.0 or above 9.0 will require remediation prior to installation.

F. Bond Testing

1. Conduct testing in accordance with the manufacturer's recommendations in various locations throughout the area where flooring is to be installed. Although the number of tests required may vary, enough tests should be performed to allow an evaluation of the entire area where material will be installed.

3.4 INSTALLATION

A. Material Installation: Measure the area to be installed and determine the direction in which the material will be installed. Marmoleum® Modular and MCT flooring products are fit using conventional tile fitting techniques. It is customary to start from the center of the room. In corridors and small spaces, it may be simpler to work lengthwise from one end, using the center line as a guide. After establishing the starting lines, spread the adhesive using a 1/16" x 1/16" x 1/16" square notch trowel. Be sure to spread adhesive all the way to the starting line without leaving any voids. Begin laying tiles at the starting point, ensuring that the tile is placed exactly along the layout lines. If the first few tiles are not installed accurately, the entire installation will be affected. The tiles must be installed into wet adhesive. Do not spread adhesive in an area larger than can be installed while ensuring 100% wet transfer to the backing of the material. Immediately roll the flooring in all directions using a 100 lb. roller to ensure proper adhesive transfer. Additional rolling is required during adhesive setup to ensure that the material is flat and fully adhered. The use of a three-section wall roller or steel seam roller is required at walls, under toe kicks or anywhere the full weight of a 100 lb. roller cannot access or be applied.

B. Adhesive Application: Use trowel recommended by flooring manufacturer for adhesive.

1. Square notch trowel as recommended by flooring manufacturer.

2. Spread rate as recommended by flooring manufacturer.

C. Flash Cove Installation: Extend the flooring up the wall in a flash-coved method to a height of 4 inches, as indicated.

D. Installation Techniques:

1. Where demountable partitions and other items are indicated for installation on top of finished flooring, install flooring before these items are installed.

2. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures and built-in furniture, including pipes, outlets, edgings, thresholds, nosings, and cabinets.

3. Extend flooring into toe spaces, door reveals, closets, and similar openings.

4. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.

5. Do not install resilient flooring over expansion joints. Use expansion joint covers manufactured for use with resilient flooring. Refer to other specification sections for expansion joint covers.

6. Adhere resilient flooring to substrate without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed installation.

7. Use adhesive applied to the substrate in compliance with the flooring manufacturer's recommendations, including those for proper spreading of the adhesive, adhesive missing and adhesive open and working times.

8. Immediately roll the flooring in all directions using a 100 lb. roller to ensure proper adhesive transfer. Additional rolling is required during adhesive setup to ensure that the material is flat and fully adhered. The use of a three-section wall roller or steel seam roller is required at walls, under toe kicks or anywhere the full weight of a 100 lb. roller cannot access or be applied.

E. Finish Flooring Patterns: As detailed on drawings and/or directed by Architect.

3.5 FIELD QUALITY REQUIREMENTS

A. Manufacturer's Field Services: Upon request of the Owner, General Contractor or Architect, and with at least 72 hours' notice, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's recommendations.

1. Site Visits: 2

3.6 PROTECTION

A. Protection: Do not allow heavy traffic or rolling loads for at least 72 hours following the installation. Additional time may be necessary if the installation is over a non-porous substrate. Protect installed product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of Substantial Completion.

3.7 CLEANING

A. Initial Maintenance: In order to allow the adhesive to dry and cure properly, wait a minimum of five days following the installation before conducting wet cleaning procedures or initial maintenance. Additional time may be necessary if the installation is over a non-porous substrate.

B. Procedure:

1. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's recommendations prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

2. Remove visible adhesive and other surface blemishes using cleaning methods recommended by floor manufacturer.

3. Marmoleum® with Topshield 2™ is pre-sealed and pre-finished. It is occupancy ready and no additional finish is required at the time of installation. See manufacturers' recommendations for further information.

4. Remove all surface soil, debris, sand and grit by dust mopping, sweeping or vacuuming the floor.

5. Mix a neutral pH cleaning solution according to the label directions and apply the solution to the floor. Do NOT flood the floor. Allow the solution to dwell on the floor for 5 – 10 minutes.

6. Scrub the floor using a 3M™ Red Buffer Pad #5100 or equivalent.

7. Pick up the scrubbing solution with a wet vacuum or an automatic scrubber.

8. Rinse the entire floor surface with a clean mop using clean, cool water.

9. Allow the floor to dry thoroughly before allowing traffic.

3.8 INITIAL MAINTENANCE PROCEDURES

A. General: Include in Contract Sum Amount cost for initial maintenance procedures, and execute procedures after flooring installation as recommended by flooring manufacturer.

B. Initial maintenance to be conducted by awarded Flooring Contractor.

END OF SECTION 09 6516

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This section includes the following:

1. Resinous flooring system as shown on the drawings and in schedules.

B. Related sections include the following:

1. Cast-in-Place Concrete, section 03 30 00

1.3 SYSTEM DESCRIPTION

A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane and a squeegee-applied resinous flooring system with decorative chip broadcasts and topcoat. The system shall have the color and texture as specified by the Owner with a nominal thickness of 3/16 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

B. Cove base to be applied where noted on plans and per manufacturers standard details unless otherwise noted.

1.4 SUBMITTALS

A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.

B. Manufacturer’s Safety Data Sheet (SDS) for each product being used.

C. Samples: A 3 x 3 inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

1.5 QUALITY ASSURANCE

A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.

B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.

C. No requests for substitutions shall be considered that would change the generic type of the specified System.

D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.

E. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

F. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping

1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.

B. Storage and Protection

1. The Applicator shall be provided with a storage area for all components. The area shall be between 60 F and 90 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.

2. Copies of Safety Data Sheets (SDS) for all components shall be kept on site for review by the Engineer or other personnel.

C. Waste Disposal

1. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.7 PROJECT CONDITIONS

A. Site Requirements

1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.

2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.

3. The application of Accelera where jobsite relative humidity is less than 30% is not recommended.

4. Use Accelera LH resin where jobsite relative humidity is between 10% and 30%.

5. 5. The Applicator shall ensure that adequate ventilation is available for the work area.

6. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.

1. Concrete shall be moisture cured for a minimum of 3 days and have fully cured a minimum of 5 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.

2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).

3. Sealers and curing agents should not to be used.

4. Concrete shall have a minimum design strength of 3,500 psi. and a maximum water/cement ratio of 0.45

5. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements

1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.

2. "No Smoking" signs shall be posted at the entrances to the work area.

3. The Owner shall be responsible for the removal of foodstuffs from the work area.

4. Non-related personnel in the work area shall be kept to a minimum.

1.8 WARRANTY

A. Dur-A-Flex, Inc. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to Dur-A-Flex, Inc. published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.

B. Dur-A-Flex, Inc. liability with respect to this warranty is strictly limited to the value of the material purchase.

PART- 2 PRODUCTS

2.1 FLOORING

A. Dur-A-Flex, Inc, ACCELERA HC self-leveling, decorative chip broadcast, cementitious urethane/blended polymer seamless flooring system

1. System Materials:

a. Topping: Dur-A-Flex, Inc, Poly-Crete SL resin, hardener and SL aggregate.

b. The broadcast aggregate shall be Dur-A-Flex, Inc. Micro or Macro chips.

c. 2nd Broadcast Coat: Dur-A-Flex, Inc, ACCELERA resin and hardener.

d. Topcoat: Dur-A-Flex, Inc. ACCELERA resin and hardener.

e. Integral Cove Base: Dur-A-Flex, Inc. Dur-A-Glaze #4 Cove Rez resin and Dur-A-Glaze #4 hardener.

2. Patch Materials

a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Poly-Crete SL (up to 1/2 inch).

b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Poly-Crete WR.

B. Substitution requests shall be considered in accordance with contract provisions and the performance requirements outlined in this document.

2.2 MANUFACTURER

A. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802

B. Manufacturer of Approved System shall be single source**.**

2.3 PRODUCT REQUIREMENTS

A. Topping

1. Membrane

a. ELAST-O-COAT Waterproofing Membrane

b. Film Thickness: 30 mils

c. VOC: 4.34 g/L

d. Tensile Strength, ASTM D-412: 2,400 psi

e. Hardness, Shore A ASTM D2240: 90

f. Tensile Strength: ASTM D-412

2. Cove Base

a. DUR-A-GLAZE #4 COVE-REZ

b. VOC: 3.83 g/L

c. Bond Strength to Concrete ACI-403: Concrete fails before loss of bond

d. Compressive Strength, ASTM D-695: 17.5-19,000 psi

e. Tensile Strength, ASTM D 638: 12-13,000 psi

f. Flexural Strength, ASTM D 790: 18-19,000 psi

g. Hardness, Shore D ASTM D2240: 75-80

h. Flame Spread / NFPA-101, ASTM E-84: Class A

3. Poly-Crete SL

a. Percent Reactive: 100 %

b. VOC: 0 g/L

c. Bond Strength to Concrete ASTM D 4541: 400 psi, substrates fails

d. Compressive Strength, ASTM C579: 9,000 psi

e. Tensile Strength, ASTM D 638: 2,175 psi

f. Flexural Strength, ASTM D 790: 5,076 psi

g. Impact Resistance @ 125 mils, MIL D-3134: 160 inch lbs

B. Broadcast and Topcoat

1. ACCELERA

a. Percent Solids: 100 %

b. VOC: 0 g/L

c. Bond Strength to Concrete ASTM D 4541: 400 psi, substrates fails

d. Hardness, Shore D ASTM D2240: 70

e. Compressive Strength, ASTM C579: 18,000 psi

f. Tensile Strength, ASTM D638: 2,600 psi

g. Abrasion Resistance, ASTM D4060: 27 mg loss, C-17 Wheel, 1,000 gm load, 1,000 cycles

h. Pot life @ 70 F: 7 – 10 minutes

i. Gloss (ASTM D523) 60°: 90

j. Coefficient of Friction (ASTM D2047): 0.6

C. Primer and Topcoat

1. ACCELERA EXT

a. Percent Solids: 96 %

b. VOC: 33 g/L

c. Bond Strength to Concrete ASTM D 4541: 400 psi, substrates fails

d. Hardness, Shore D ASTM D2240: 70

e. Compressive Strength, ASTM C579: 18,000 psi

f. Tensile Strength, ASTM D638: 2,600 psi

g. Abrasion Resistance, ASTM D4060: 27 mg loss, C-17 Wheel, 1,000 gm load, 1,000 cycles

h. Potlife @ 70 F: 10 – 15 minutes

i. Gloss (ASTM D523) 60: 90

j. Coefficient of Friction (ASTM D2047) : >0.6

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.2 PREPARATION

A. General

1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.

2. Moisture Testing: Perform tests recommended by manufacturer and as follows.

a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 20 lbs/1,000 sf/24 hrs.

b. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.

c. If the vapor drive exceeds 99% relative humidity or 20 lbs/1,000 sf/24 hrs then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.

3. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a light passing of a propane torch may be used to dry the substrate.

4. Mechanical surface preparation

a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum CSP of 3 as described by the International Concrete Repair Institute.

b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.

c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch

d. key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.

e. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations. Refer to Dur-A-Flex joint guidelines.

f. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

A. General

1. The system shall be applied in four distinct steps as listed below:

    a. Substrate preparation

    b. Topping/overlay application with decorative chip broadcast.

    c. Resin application with decorative chip broadcast

    d. Topcoat application

2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.

3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.

4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.

5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Membrane

1. The membrane shall be applied on suitable substrates and molded up onto vertical areas, over curbs, etc. as a seamless elastomeric membrane.

2. For use underneath epoxy flooring systems to provide a vibration resilient cushion and to deaden sound and as a crack & joint filler.

3. Fiberglass mat to be embedded into ELAST-O-COAT over control joints or where the floor meets the wall.

4. DUR-A-GLAZE #4 COVE-REZ

    a. Prime the wall with a light coat of the mixed resin and hardener.

    b. Trowel up a mixture of 1 qt. DUR-A-GLAZE COVE RESIN to 1 pt. DUR-A-GLAZE #4 Hardener to 25lbs FLINTSHOT, DUR-A-QUARTZ Q-11 or Q-28.

    c. After curing, use a brush to topcoat.

    d. Remove any excess material with a squeegee. This should be done by pulling the material down to the bottom of the cove radius, then back up to the top edge of the cove.

C. Topping

1. The topping shall be applied as a self-leveling system as specified by the Architect. The topping shall be applied in one lift with a nominal thickness of 1/8 inch.

2. The topping shall be comprised of three components, a resin, hardener and aggregate as supplied by the Manufacturer at a rate of 55 sq ft per kit

3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. SL Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.

4. The topping shall be applied over horizontal surfaces using a ½" V-notched squeegee, trowels or other systems approved by the Manufacturer.

5. Immediately upon placing, the topping shall be degassed with a loop roller.

6. Chip aggregate shall be broadcast to excess into the wet resin, Macro chip at the rate of 0.1 lbs/sf and Micro chip at the rate of 0.15 lbs/sf.

7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

D. Second Broadcast Coat

1. The second broadcast coat shall be comprised of two components: a resin and a hardener as supplied by the Manufacturer and mixed per manufacturer instructions.

2. The hardener shall be added to the resin and thoroughly mixed by suitably approved mechanical means.

3. The second broadcast coat shall be applied over horizontal surfaces using a flat squeegee and cross rolled with a 3/8 inch nap roller at the rate of 65 SF/kit.

4. Chip aggregate shall be broadcast to excess into the wet resin, Macro chip at the rate of 0.1 lbs/sf and Micro chip at the rate of 0.15 lbs/sf.

5. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

E. Topcoat

1. The topcoat shall be comprised of ACCELERA resin and hardener mixed per the manufacturer's instructions.

2. The topcoat shall be applied using a flat squeegee and cross rolled with a 3/8 inch nap roller at the rate of 65 SF/kit.

3. The finished floor will have a nominal thickness of 3/16 inch.

3.4 FIELD QUALITY CONTROL

A. Tests, Inspection

1. The following tests shall be conducted by the Applicator:

a. Temperature

i. Air, substrate temperatures and, if applicable, dew point.

b. Coverage Rates

i. Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.5 CLEANING AND PROTECTION

A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.

B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION 09 6723

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Section Includes: Stainless Steel Wall Panels.

1.3 REFERENCES

A. National codes (IBC, UBC, SBCCI, BOCA and Life Safety)

B. American Society for Testing and Materials (ASTM)

1.4 SUBMITTALS

A. Submit the following in accordance with conditions of contract and Division 1 specification Section 01 3300 “Submittal Procedures”.

B. Product Data: Manufacturer’s printed product data and detailed specifications for each system component and installationaccessory required, including installation methods for each type of substrate.

C. Shop drawings showing locations, extent, installation and mounting details with the appropriate adhesives for specific project substrates.

D. Manufacturer’s Installation Instruction: Printed installation instructions for stainless steel wall panels.

E. Maintenance data for wall protection system components for inclusion in the operatingand maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

A. Installer qualifications: Engage an installer who has no less than 3 years’ experience in installation of systems similar in complexity to those required for this project.

B. Manufacturer's qualifications: Not less than 5 years’ experience in the production of specified products and a record of successful in-service performance.

C. Code compliance: Assemblies should conform to all applicable codes including IBC, UBC, SBCCI, BOCA and Life Safety.

D. Fire performance characteristics: Provide stainless steel components tested in accordance with ASTM E84 for Class A/1 fire characteristics.

E. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in unopened factory packaging clearly labeled to show manufacturer to the jobsite.

B. Inspect materials at delivery to assure that specified products have been received.

C. Store in original packaging in a climate-controlled location away from direct sunlight.

D. Materials must be stored flat.

1.7 PROJECT CONDITIONS

A. Environmental Requirements: Products must be installed in an interior climate-controlled environment.

1.8 WARRANTY

A. Standard Limited Lifetime Warranty against material and manufacturing defects.

PART- 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturer: CS Acrovyn Stainless Steel Sheet.

B. Substitution requests shall be considered in accordance with contract provisions

C. Provide all stainless-steel wall panels and wall protection from a single source.

2.2 MANUFACTURED UNITS

A. Wall Panels

B. Stainless Steel Wall Panels

C. Provide stainless steel wall panel systems furnished as a complete packaged system that include panels, outside corners and inside corners. Panel system shall include stainless steel panels that have recessed overlap joints that maintain panel flatness and minimizes panel protrusion.

D. Panel Size – Custom, Maximum 4’ x 10’

E. Panel Thickness - 16 gauge with standard Smooth texture.

F. Stainless Steel - Type 304 (type 304 conforms to NSF Standard 51)

G. Stainless Steel Outside Corners

H. 1. 2” x 2”, 16 gauge. Maximum Height 96”, edges shall have an 11° taper

I. Stainless Steel - Type 430 or type 304 (type 304 conforms to NSF Standard 51)

J. Attachment: Adhesive mount or screw mount

K. Stainless Steel Inside Corners

L. 1. 2” x 2” 16 gauge. Maximum Height 96”, edges shall have an 11° taper

M. Stainless Steel - Type 430 or type 304 (type 304 conforms to NSF Standard 51)

N. Attachment: Adhesive mount or screw mount

2.3 MATERIALS

A. Stainless Steel

B. Wall panels shall be manufactured from Type 304, 16 gauge. Stainless Steel.

C. Outside and Inside Corners

D. Thickness - 16 gauge

E. Type 4304 (conforms to NSF Standard 51)

2.4 COMPONENTS

A. Attachment

B. Panels

C. Panels shall be adhered with field applied heavy duty adhesive.

D. Corner Guards

E. Adhesive mount - Corner guards shall be adhered with field applied heavy duty adhesive and foam tape.

F. Screw mount – Corner guards shall be attached with stainless steel Phillips head screws into counter sunk beveled mounting holes.

G. Edge finish – Edges shall be finished with color-matched caulk.

2.5 FINISH

A. Stainless Steel: Panels and corner guards shall have a No. 4 satin finish.

B. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applications and designations of finishes.

2.6 FABRICATION

A. Fabricate wall protection products to comply with requirements indicated for design, dimensions, detail, finish and sizes.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions in which the wall panel systems will be installed.

B. Complete all finishing operations, including painting, before beginning installation of wall panel system materials.

C. Identify conditions detrimental to proper or timely completion. Do not proceed until unsatisfactory conditions have been corrected.

D. Wall surface shall be dry and free from dirt, grease and loose paint.

3.2 PREPARATION

A. General: Prior to installation, clean substrate to remove dust, debris and loose particles.

B. Perform additional preparation procedures as required by manufacturer's instructions.

C. Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.3 INSTALLATION

A. Install the work of this section in strict accordance with the manufacturer's recommendations using only approved hardware and locating all components firmly into position, level and plumb.

3.4 CLEANING

A. Immediately upon completion of installation, clean wall protection products and accessories in accordance with manufacturer's recommended cleaning method.

B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.5 PROTECTION

A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains

END OF SECTION 09 7813

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 DESCRIPTION OF WORK

A. The work includes the painting of all interior exposed items and surfaces throughout the project, except as herein specified. Surface preparation, priming and coats of paint specified are in addition to shop priming and surface treatment specified under other sections, except as otherwise specified.

B. The work includes the field painting or finishing of all miscellaneous exposed surfaces, and primed metal surfaces of equipment in the following locations.

1. Interior Painting: Panel board covers, etc. mounted in exposed areas.

2. Gypsum board walls & ceilings, Woodwork, Metal Doors & Metal Frames.

3. All other items in finished areas that previously have been painted.

4. Plastic trim and paneling.

5. Interior painting of exposed steel

6. Exterior painting of exposed steel.

7. Painting exterior face of overhead door.

8. Painting exterior metal doors and frames, steel handrails, all exterior lintels and other miscellaneous ferrous metals.

9. Painting of all new work.

C. The term "paint" as used herein means all coating systems materials, which includes primers, emulsions, enamels, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

D. Paint all exposed surfaces except where the natural finish of the material is obviously intended. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas.

E. Operating Parts and Labels:

1. Do not paint any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts, unless otherwise indicated.

2. Do not paint over any code-required labels, such as Underwriters Laboratories and Factory Mutual, or any equipment identification performance rating, name, or nomenclature plates.

1.3 QUALITY ASSURANCE

A. Provide the best quality grade of the various types of coatings as regularly manufactured by approved paint materials manufacturers listed below. Materials not displaying the manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Submit manufacturer's specifications, including paint label analysis and application instructions for each material specified.

C. List each material and cross-reference to the specific paint and finish system and application. Identify by manufacturer's catalog number and general classification.

D. Submit samples for Architect's review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

E. Provide finish coats, which are compatible with the prime paints used. Review other sections of these specifications in which paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon requests from other subcontractors, furnish information on the characteristics of the specified finish materials to ensure that compatible prime coats are used.

F. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Architect in writing of any anticipated problems using the coating systems as specified with substrates primed by others.

G. Fire Hazard Classification:

1. Provide coatings which have been tested in accordance with ASTM E 84, maximum of 25 all surfaces, and are listed in Underwriters Laboratories "Building Materials Directory".

1.4 DELIVERY AND STORAGE

A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and application instructions thereon.

B. Provide labels on each container with the following information:

1. Name or title of material.

2. Fed. Spec. Number, if applicable.

3. Manufacturer's stock number.

4. Manufacturer's name.

5. Contents by volume, for major pigment and vehicle constituents.

6. Thinning instructions.

7. Application instructions.

C. Coating Maintenance Manual: Upon conclusion of the project, the contractor or manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin Williams “Custodian Project Color and Product Information” or equal. Manual shall include an Area Summary with finish schedule. Area Detail designating where each product/color/finish was use product data pages, Material Safety Data Sheets, care and cleaning instructions, touch up procedures and color samples of each color and finished used.

1.5 JOB CONDITIONS

A. Work under this Section shall be scheduled and coordinated with other trades and shall not proceed until other work and/or job conditions are as required to achieve satisfactory results.

B. Do not apply paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 55° F unless otherwise permitted by the paint manufacturer's printed instructions.

C. Do not apply paint when the relative humidity exceeds 85% or to damp or wet surfaces; unless permitted by the manufacturer's printed instructions. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

D. Environmental conditions shall be maintained in compliance with the recommendation of the manufacturers for respective finishes required and the following criteria:

1. Before painting is started in any area, it shall be broom cleaned and excessive dust shall be removed.

2. After painting operations begin in a given area, broom cleaning will not be allowed; cleaning shall then be done only with commercial vacuum cleaning equipment.

3. Adequate illumination shall be provided in all areas where painting operations are in progress.

E. All materials shall be stored in a single place, as directed. Such storage place shall be kept neat and clean, and all damage thereto or its surroundings shall be made good. Any soiled or used rags; waste and trash must be removed from the building every night. Every precaution must be taken to avoid the danger of fire.

PART- 2 PRODUCTS

2.1 MATERIALS

A. General:

1. Paint products, shall be of type specified under Finish Schedule. Basic painting materials such as linseed oil shellac, turpentine, thinners, driers, etc., shall be of highest quality and have identifying labels on containers.

2. Approved manufacturers of painting and textured finish products materials are listed in following paragraph. Match the colors as required and submit samples for approval before proceeding with the work.

2.2 MANUFACTURERS

A. Paint:

1. Sherwin Williams

2. Benjamin Moore Paint Co.

3. ICI

B. Structural steel exposed (exterior & interior).

2.3 INTERIOR PAINT AND COATING COMMERCIAL SYSTEMS

A. **(PT-1)** Metal doors and frames and miscellaneous metal surfaces:

1. 1 coat Industrial Metal Primer (unprimed surfaces) Dining Room – Sherwin Williams Pro-Cryl Primer B66W01310.

2. 2 coats (pre-primed surfaces) - Pro Industrial DTM Acrylic.

3. Finish- Eggshell

4. Patch all surfaces as required to achieve smooth finish and sand smooth. Hand sand all surfaces to be painted with extra fine sandpaper on painted or sealed surfaces.

B. **(PT-2)** Gypsum board ceilings and soffits:

1. 1 coat - Pro Mar 200 Primer Zero VOC B28W02600.

2. 2 coats - Pro Mar 200 Zero VOC B30W12651

3. Finish: Flat

C. **(PT-3)** Gypsum wallboard wall surfaces:

1. 1 coat - Pro Mar 200 Zero VOC B28W02600

2. 2 coats - Pro Mar 200 Zero VOC B20W01951

3. Finish: Low gloss Egg-Shel

D. **(PT-4)** Interior Metal: (Piping, hangers, and other miscellaneous metals)

1. 1st coat- Polyamidoamine Epoxy, Tnemec Series N69. Sherwin Williams Duraplate 235 B67W00235.

2. 2nd and 3rd coat- Aliphatic Polyurethane, Tnemec Series 1075V Endurashield II. Sherwin Williams Hi Solids Polyurethane 100 B65-630.

PART- 3 EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions under which painting work is to be performed. Do not proceed with the work until unsatisfactory conditions have been corrected.

B. Starting of painting work will be construed as the applicator's acceptance of the surfaces within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, runs in shop prime coats, or conditions otherwise detrimental to the formation of a durable paint film.

3.2 SURFACE PREPARATION

A. General: Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.

B. Patch all surfaces as required to achieve smooth finish and sand smooth.

C. Hand sand all surfaces to be painted with extra fine sandpaper on painted or sealed surfaces.

D. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted, or provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and

adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.

E. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.

F. Wood, Composite Panels and Mineral Profile Panels:

1. Hand sand wood surfaces to be painted of all existing finishes, as required. Clean surface prior to painting.

2. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dried.

3. Spray coating to a smooth and uniform finish, with no orange peal effect.

G. Gypsum Drywall:

1. Repair all holes exposed tape joints or other irregularity in surface.

2. Touch sand all joint compound to remove surface irregularities and "tooth" wipe free of dust. Do not permit sanding to raise paper surface of gypsum board. Wipe surface clean.

H. Ferrous Metals:

1. Surface preparation of Steel.

    a. Prepare steel surfaces in accordance with manufacturer's instructions.

    b. Fabrication Defects:

        i. Correct steel and fabrication defects revealed by surface preparation.
        ii. Remove weld spatter and slag.
        iii. Round sharp edges and corners of welds to a smooth contour.
        iv. Smooth weld undercuts and recesses.
        v. Grind down porous welds to pinhole-free metal.
        vi. Remove weld flux from surface.

    c. Ensure surfaces are dry.

    d. Removed visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 6/NACE 3, unless otherwise specified.

    e. Abrasive Blast-Cleaned Surfaces: Coat abrasive blast-cleaned surfaces with primes before visible rust forms on surface. Do not leave blast-cleaned surfaces uncoated for more than 8 hours.

f. Shop Primer: Prepare shop primer to receive filed coat in accordance with manufacturer's instructions.

I. Plastic Surfaces:

1. Hand sand surface with fine sandpaper. Wipe surface clean.

3.3 MATERIALS PREPARATION

A. General: Mix and prepare painting materials in strict accordance with the manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.

C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film, which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.

D. Tinting:

1. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are to be applied. Tint undercoats to match the color of the finish coat but provide sufficient difference in shade of undercoats to distinguish each separate coat. Provide a code number to identify material tinted by the manufacturer.

3.4 APPLICATION

A. General:

1. Apply paint to brush, roller or spray in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile lamb's wool as recommended by the paint manufacturer for material and texture required. Spray paint uniformly with suitable equipment.

2. On gypsum board surfaces, primer may be sprayed, but remaining coats are to be rolled. Metal doors, frames, HVAC wall diffusers and radiator covers shall be sprayed all coats.

3. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried.

4. Sand between coat applications with fine sandpaper or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.

5. Apply additional coats when undercoats, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance.

B. Minimum Coating Thickness:

1. Apply each material at not less than the manufacturer's recommended spreading rate, to provide a total dry film thickness of not less than 5.0 mils for the entire coating system of prime and finish coats for 3-coat work.

C. Prime Coats:

1. Before application of finish coats, apply a prime coat to material which is required to be painted or finished, and which has not been prime coated by others.

D. Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

E. Pigmented (Opaque) Finishes:

1. Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage.

2. Provide semi-gloss finish for final coats, unless otherwise indicated.

F. Brush Application:

1. Brush-out and work all brush coats onto the surfaces in an even film. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable. Neatly draw all glass lines.

G. Completed Work:

1. Match approved samples for color, texture and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.5 PROTECTION

A. Protect work of other trades, whether to be painted or not, against damage by the painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing or replacing, and repainting, as directed by the Architect.

B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.6 CLEAN-UP

A. During the progress of the work, remove from the project all discarded paint materials, rubbish, cans and rags.

B. Upon completion of painting work, clean all window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.7 ACCEPTANCE

A. It shall be distinctly understood that by using materials specified and going over surface number of times specified, acceptance will not be assured.

B. Acceptance at final inspection will be governed by body finish and effect produced. Additional coats shall be applied as required to produce proper finish and coverage, if required, at no additional cost to Owner.

C. Any wall, which is touched up, and the area remains noticeable, the entire wall shall be repainted, at no additional cost to the Owner.

END OF SECTION 09 9000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provision of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. Refer to other sections of the specification, drawings, and details to determine type and extent of work there if affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SECTION INCLUDES

A. Exterior high-performance paint and coatings systems including surface preparation.

1.3 RELATED SECTIONS

A. Section 05 5000 - Metal Fabrications.

B. Section 05 1200 Structural Steel

C. Section 05 3100 Steel Decking

1.4 REFERENCES

A. Steel Structures Painting Council (SSPC):

1. SSPC-SP 1 - Solvent Cleaning.
2. SSPC-SP 2 - Hand Tool Cleaning.
3. SSPC-SP 3 - Power Tool Cleaning.
4. SSPC-SP5/NACE No. 1, White Metal Blast Cleaning.
5. SSPC-SP6/NACE No. 3, Commercial Blast Cleaning.
6. SSPC-SP7/NACE No. 4, Brush-Off Blast Cleaning.
7. SSPC-SP10/NACE No. 2, Near-White Blast Cleaning.
8. SSPC-SP11, Power Tool Cleaning to Bare Metal.
9. SSPC-SP12/NACE No. 5, Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating.
10. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete.

B. Material Safety Data Sheets / Environmental Data Sheets: Per manufacturer's MSDS/EDS for specific VOCs (calculated per 40 CFR 59.406). VOCs may vary by base and sheen.

C. California Department of Public Health (CDPH):

1. CDPH v1.1-2010 and V1.2-2017

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: For each paint system indicated, including.

1. Product characteristics.

2. Surface preparation instructions and recommendations.

3. Primer requirements and finish specification.

4. Storage and handling requirements and recommendations.

5. Application methods.

6. Cautions for storage, handling and installation.

C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's products, colors and sheens available.

D. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.

E. Coating Maintenance Manual: Upon conclusion of project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams, "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used. "

F. Only submit complying products based on project requirements (i.e. LEED). One must also comply with the regulations regarding VOCs (CARB, OTC, SCAQMD, LADCO). To ensure compliance with district regulations and other rules, businesses that perform coating activities should contact the local district in each area where the coating will be used.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Paint exposed surfaces. If a color of finish, or a surface is not specifically mentioned, Architect will select from standard products, colors and sheens available.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels unless indicated.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish surfaces for verification of products, colors and sheens.

2. Finish area designated by Architect.

3. Provide samples that designate primer and finish coats.

4. Compatibility and Adhesion: Check after one week of drying and curing by testing in accordance with ASTM D3359; Adhesion by tape test. If coating system is incompatible, additional surface preparation up to and including complete removal may be required.

5. Do not proceed with remaining work until the Architect approves the mock-up.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information.

1. Product name, and type (description).

2. Application and use instructions.

3. Surface preparation.

4. VOC content.

5. Environmental handling.

6. Batch date.

7. Color number.

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

C. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

D. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

B. Furnish Owner with an additional one percent of each material and color, but not less than 1 gal (3.8 l) or 1 case, as appropriate.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Sherwin-Williams, which is located at: 101 Prospect Ave.; Cleveland, OH 44115; ASD Toll Free Tel: 800-524-5979; Tel: 216-566-2000; Fax: 440-826-1989; Email: request infospecifications@sherwin.com; Web:www.swspecs.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 APPLICATIONS/SCOPE

A. High Performance Exterior Paint and Coating Systems:

1. Metal: Miscellaneous iron, ornamental iron, ferrous metal.

2. Formed, Poured in Place Concrete.

2.3 PAINT MATERIALS - GENERAL

A. Paints and Coatings:

1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufactures product instructions for optimal color conformance.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Coating Application Accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

D. Color: Refer to Finish Schedule for paint colors, and as selected by Owner.

2.4 HIGH PERFORMANCE EXTERIOR PAINT AND COATING SYSTEMS

A. **(PT-5)** Metal - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous and Ornamental Iron, Structural Iron, Ferrous Metal).

1. Urethane System; Solvent Base:

a. Gloss Finish:

i. 1st Coat: S-W Macropoxy 646-100 Fast Cure Epoxy, B58 Series (7.0-13.5 mils wet, 5.0-10.0 mils dry per coat).

ii. 2nd Coat: S-W Hi-Solids Polyurethane 250 Gloss or Semi-Gloss, B65-Series.

iii. 3rd Coat: S-W Hi-Solids Polyurethane 250 Gloss or Semi-Gloss, B65-Series. (4.5-8.0 mils wet, 3.0-5.0 mils dry per coat).

PART- 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared; notify Architect of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

B. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

C. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

A. General: Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.

1. Prior to attempting to remove mildew, it is recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions are advised.

2. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply solution and scrub the mildewed area. Allow solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow surface to dry before painting. Wear protective

glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

3. Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

4. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50 degrees F (10 degrees C), unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50 degrees F (10 degrees F) or higher to use low temperature products.

B. Aluminum: Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.

C. Block (Cinder and Concrete): Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75 degrees F (24 degrees C). The pH of the surface should be between 6 and 9 unless the products are designed to be used in high pH environments. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.

D. Concrete, SSPC-SP13 or NACE 6: This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.

E. Copper and Stainless Steel: Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP 2, Hand Tool Cleaning.

F. Galvanized Metal: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP16 is necessary to remove these treatments.

G. Steel: Structural, Plate, And Similar Items: Should be cleaned by one or more of the surface preparations described below. These methods are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Society of Protective Coatings. A brief description of these standards together with numbers by which they can be specified follow.

1. Solvent Cleaning, SSPC-SP1: Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.

2. Hand Tool Cleaning, SSPC-SP2: Hand Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this

process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

3. Power Tool Cleaning, SSPC-SP3: Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

4. White Metal Blast Cleaning, SSPC-SP5 or NACE 1: A White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

5. Commercial Blast Cleaning, SSPC-SP6 or NACE 3: A Commercial Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 33 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

6. Brush-Off Blast Cleaning, SSPC-SP7 or NACE 4: A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.

7. Power Tool Cleaning to Bare Metal, SSPC-SP11: Metallic surfaces that are prepared according to this specification, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted. Prior to power tool surface preparation, remove visible deposits of oil or grease by any of the methods specified in SSPC-SP1, Solvent Cleaning, or other agreed upon methods.

8. Near-White Blast Cleaning, SSPC-SP10 or NACE 2: A Near White Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 5 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

9. High- and Ultra-High Pressure Water Jetting for Steel and Other Hard Materials: SSPC-SP12 or NACE 5: This standard provides requirements for the use of high- and ultra-high pressure water jetting to achieve various degrees of surface cleanliness. This standard is limited in scope to the use of water only without the addition of solid particles in the stream.

10. Water Blasting, SSPC-SP12/NACE No. 5: Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4 to 14 gallons per minute.

3.3 INSTALLATION

A. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendations.

B. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content. Wait until wood is fully dry after rain or morning fog or dew.

C. Apply coatings using methods recommended by manufacturer.

D. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

E. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.

F. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.

G. Inspection: The coated surface must be inspected and approved by the Architect just prior to the application of each coat.

3.4 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION 09 9100

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Work Included;

1. Stencil Warning Sign.

2. Fire Extinguisher Cabinet Signs

1.3 QUALITY ASSURANCE

A. Uniformity: For each sign form and graphic image process indicated, furnish products of a single manufacturer.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required.

B. Samples: Submit samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacturer and design of each sign component including graphics.

C. Shop Drawings: Provide drawings indicating layout and construction with full size selections of typical members.

PART- 2 PRODUCTS

2.1 MATERIALS

1. Stencil Warning Sign:

a. Provide custom cut out stencil on walls above ceiling of all one hour rated walls, font to be 2" high, sign to read:

"ONE HOUR FIRE RATED SMOKE BARRIER – SEAL ALL OPENINGS".

2. Fire Extinguisher Cabinet Sign

a. 9"x7" 2D projection panel, 2 viewable sides; reflective.

b. As manufactured by Compliance signs, model # NHE-27897PROJ (or equal.)

PART- 3 EXECUTION

3.1 INSTALLATION

A. Securely install plumb and level in conformance with approved submittals and manufacturer's recommendations.

B. Interior Panel Signs: Wall mount adjacent to door at 5'-0" above finished floor to centerline of sign.

C. Provide custom cut out stencil on walls above ceiling of all smoke walls, sign to read:

1. **"ONE HOUR FIRE RATED SMOKE BARRIER – SEAL ALL OPENINGS".**

2. Use red spray paint to create sign.

3. Space Stencil Waring Sign at 10' – 0" o.c. visible above ceiling.

3.2 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces in according to manufacturer's instructions. Protect from damage until acceptance.

END OF SECTION 10 1400

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to, complete this section whether or not it is clearly or explicitly shown.

1.2 DESCRIPTION OF WORK

A. The extent of miscellaneous specialties work is as shown on the drawings and specified herein, including:

1. Fire Extinguishers & Cabinets.

1.3 SUBMITTALS

A. Submit manufacturer's cuts, installation details and/or shop drawings of all items specified in accordance with the Supplementary Conditions.

PART- 2 PRODUCTS

2.1 FIRE EXTINGUISHER AND CABINETS

A. Manufacturer: Subject to compliance with requirements, provide Fire Extinguisher and Cabinets from one of the following:

1. Potter-Roemer
2. Lausen Manufacturing Co.
3. J.L. Industries

B. Fire Extinguisher Cabinets: Potter-Roemer, or equal, 7025 - DV-6-SS -VB, recessed, Stainless Steel 304 #6 dull satin finish. Cartridge operated by wet chemical

C. Fire extinguishers for cabinets shall be Model 3202 Class K extinguisher as manufactured by Potter Roemer or approved equivalent, red enamel.

D. All fire extinguishers shall be fully loaded just prior to acceptance of building.

PART- 3 EXECUTION

3.1 INSTALLATION

A. Install specialty items as recommended by the manufacturer. Provide all required accessories, sealant, hardware, fasteners, etc. for complete installation.

B. Assemble items and associated fittings and trim in accordance with manufacturer's instructions.

C. Install supports attached to building structure for equipment requiring supports.

D. Install equipment level, plumb, and firmly in place in accordance with manufacturer's rough-in drawings.

3.2 CLEANING AND PROTECTION

A. Repair or replace defective work, including damaged equipment and components.

B. Clean unit surfaces, and leave in ready-to-use condition.

3.3 TESTING AND ADJUSTING

A. Test each piece of equipment provided with moving parts to assure proper operation, freedom of movement, and alignment.

B. Repair or replace malfunctioning equipment, or equipment with parts that bind or are misaligned.

END OF SECTION 10 1800

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. This section includes the following types of wall protection systems:

1. Corner Guards.
2. End Mount Wall Protectors.
3. Crash Rails.
4. High Impact Wall Panels.
5. Door Frame Guards.

1.3 SUBMITTALS

A. General:

1. Submit the following in accordance with conditions of contract and Division1 specification section 01 3300 “Submittal Procedures”.
2. Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.
3. Shop drawings showing locations, extent and installation details of corner guards. Show methods of attachment to adjoining construction.
4. Samples for verification purposes: Submit the following samples, as proposed for this work, for verification of color, texture, pattern, finish and end cap attachment and alignment.
    a. 12" long sample of each model specified including end cap and mounting hardware.

B. Product test reports from a qualified independent testing laboratory showing compliance of each component with requirements indicated.

C. Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Coordinate carpentry work to assure proper installation of solid fire-retardant wood blocking for all accessories. Use of toggle or expansion type anchors in gypsum board shall not be permitted.

B. Coordinate accessory locations with other work to avoid interface and to assure proper and serving of accessory units.

C. Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable to Architect.

1. Material shall be UL classified: Identified upon shipment with appropriate marking and shall be supported by Underwriter's Laboratories, Inc. follow up procedures.

2. Impact Strength: Provide assembled wall protection units that have been tested in accordance with the applicable provisions of ASTM F476.

3. Chemical and stain resistance: Provide wall protection system components with chemical and stain resistance in accordance with ASTM D543.

4. Color match: Provide wall protection components that are color matched in accordance with the following:

    a. Delta Ecmc of no greater than 1.0 using CIELab color space.

    b. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.

B. Store materials in original, undamaged packaging in a cool, dry place out of direct sunlight and exposure to the elements. A minimum room temperature of 40°F and a maximum of 100°F should be maintained.

C. Material must be stored flat.

1.6 PROJECT CONDITIONS

A. Materials must be acclimated in an environment of 65°-75°F for at least 24 hours prior to beginning the installation.

B. Installation areas must be enclosed and weatherproofed before installation commences.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

A. Interior surface protection products specified herein and installed on the submittal drawings shall be manufactured by:

1. C/S Group, Inc.

2. InPro Corp.

3. MM Systems Corp.

2.2 MATERIALS

A. Engineered PETG: Extruded material should be high impact polyvinyl chloride with shadow grain texture, nominal .078" thickness. Chemical and stain resistance should be per ASTM D543 standards as established by the manufacturer. Colors to be selected by Architect from one of manufacturer's standard color range.

2.3 CORNER GUARDS (CG.1)

A. Engineered SM-20N surface mount, as manufactured by C/S Group. or equal. Surface mounted guards consisting of continuous retainer with snap-on vinyl cover. Color matched end caps to be provided for both partial and full height applications. Attachment hardware shall be appropriate for wall construction.

1. 4'-0" high in locations with no handrail.

2. Height: Bottom of handrail or chair rail to top of base.

3. Provide end mount wall protectors as required.

2.4 END MOUNT WALL PROTECTORS

A. Engineered SSM-20N/SS-10N and sheet backer, surface mount, as manufactured by C/S Group. or equal. Surface mounted guards consisting of continuous retainer with snap-on vinyl cover. Color matched end caps to be provided for both partial and full height applications. Attachment hardware shall be appropriate for wall construction.

1. 4'-0" high in locations with no handrail.

2. Bottom of handrail or chair rail to top of base.

3. Provide end mount wall protectors as required.

2.5 RIGID WALL PANELS

A. Engineered rigid panel, as manufactured by C/S Group or equal. Panel shall be .040 thick roll product factory cut to 24" in height. Provide all required adhesives and accessories, in solid color to match. Vertical joint shall be allowed, color match caulked. Provide inside and outside corner trims as required.

1. RWP- 1- Acrovyn Solid Color Collections

2. RWP- 2- Acrovyn by Design Collection

2.6 DOOR FRAME GUARDS

A. Engineered model G2 Custom formed door frame guard as manufactured by InPro Corp. Vacuum form to frame size. Height to be equal to top of chair rail. Provide adhesives as recommended by manufacturer.

2.7 FABRICATION

A. General: Fabricate wall protection systems to comply with requirements indicated for design, dimensions, detail, finish and member sizes.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.

B. Provide wall backing as required per manufacturers recommendation in new and existing walls.

C. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.3 INSTALLATION

A. Install the work of this section in strict accordance with the manufacturer's recommendations, using only approved mounting hardware for each wall type, adhesives etc. and locating all components firmly into position, level and plumb.

B. Temperature at the time of installation must be between 65°-75°F and be maintained for at least 48 hours after the installation.

C. Adjust installed end caps as necessary to ensure tight seams.

3.4 CLEANING

A. General: Immediately upon completion of installation, clean guards and accessories in accordance with manufacturer’s recommended cleaning method.

B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.5 PROTECTION

A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION 10 2600

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings, and detail to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 WORK INCLUDED IN THIS SECTION

A. Supply, deliver and set in place al new l food service equipment at identified locations, and level before and after final connections by related trades.

B. Furnish and install all food service equipment as specified herein, including that which is reasonably inferred, with all related items necessary to complete work shown on contract drawings and/or required by these specifications

C. Electrical Work

1. Interwiring of food service equipment between components with equipment such as heating elements, switches, thermostats, motors, etc., complete with junction box as is applicable, ready for final connections

2. Voltages shall be indicated on the contract drawings, any differences in electrical characteristics at job site from those shown on contract documents must be submitted th Architect for consideration prior to ordering equipment

D. Plumbing Work:

1. Furnish all equipment with faucets, sink waste assemblies, and trim as specified in this section

E. Mechanical Work:

1. Provide exhaust hoods with connection collars ready for final connection by HVAC section

2. Provide stainless steel exposed ducts to ceiling for dish machine

F. Existing Equipment:

1. Contractor shall remove and store existing equipment at their expense in a controlled environment storage facility until such time as job site is ready for reinstallation.

2. Relocated those items of existing equipment noted as being reset to new position as shown on plan drawings. Coordinate resetting so as to minimize disruptions of operation of kitchen operations,

3. Remove remaining existing equipment from premises and dispose of as required.

4. All piping taps etc. for set equipment shall be new

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.

2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," 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 additional manufacturers named in the specification.

C. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by Contract Documents. Substitutions require approval by Architect for use or implementation.

1. Substitutions provisions are handled under Division 01 Section.

1.4 REFERENCES

A. All Food Service Equipment provided and installed must comply with below agencies, state department of health and county or local laws and ordinance.

B. American Society for Testing Materials (ASTM):

1. ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

2. ASTM A446, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

3. ASTM C1036, Specification for Flat Glass.

4. ASTM C1048, Specification for Heat Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.

C. American Welding Society (AWS).

D. National Electrical Manufacturers Association (NEMA).

E. National Fire Protection Association (NFPA 96).

F. National Sanitation Foundation (NSF).

G. Underwriters Laboratories Listing (UL).

1.5 SUBMITTALS

A. Electronically submit (PDFs) assembly drawings, electrical and mechanical rough-in connection plans, details for plumbing, electrical, air conditioning and ventilation services for all kitchen equipment and brochures, catalog cut-sheets, specifications and operating characteristics for buy-out equipment. Clearly indicate any deviations from contract Documents, such as arrangement of piping, connections, wiring method of fabrication, manner of structural conditions, standard shop practices, or other reasons, and note in Cover Sheet accompanying submittals.

B. Drawing of fabricated equipment shall not be less than ¾" equal one foot scale.

C. Rough-in drawings shall not be less than ¼" equal one foot scale.

D. Product Data: Provide data on appliances; indicate configuration, sizes, materials, finishes, locations, utility connections and locations.

E. Samples: Submit samples of stainless steel and other finish materials for color selection.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Manufacturer's Certificate: Certify that exhaust system and tests meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. Operation Data: Provide manuals with a sequence of operation and utility connection diagram explaining system operation and corresponding to actual devices. After approval, submit 2 sets of three ring binders.

2. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Conform to applicable State and local codes for utility requirements.

2. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc. as suitable for the purpose specified and indicated.

B. Energy Ratings: Provide appliances with energy guide labels with energy cost analysis (annual operating costs) and efficiency information as required by Federal Trade Commission.

1. Provide all appliances that are Energy Star Rated.

1.8 QUALIFICATIONS

A. Installer: Must have a minimum of 5 years documented installation experience with projects similar to this project.

B. Fabricator: Must specialize in manufacture of commercial food services equipment with minimum 5 years documented experience.

C. Manufacturer: Must specialize in manufacturing products specified in this section with a minimum of 5 years documented equipment manufacturing experience.

D. One site superintendent all be satisfactory to the Owner and Architect in all respects, and owner shall have the right to require Contractor to dismiss from the project any superintendent whose performance is not satisfactory to Owner and Architect except with another superintendent satisfactory to the Owner and Architect in all respects. At the request of the Architect, the Contractor's superintendent shall attend project meetings, whether the project meetings are prior to the start of the Contractor's work.

1. Contractor shall provide a superintendent with experience in managing project of this size and complexity with minimum three (3) projects including projects completed on time per contract. Experience shall be documents in writing from end user and design consultant.

1.9 DELIVERY, STORAGE AND HANDLING

A. Store products clear of floor in a manner to prevent damage.

B. Coordinate size of access and route to place of equipment installation.

C. Coordinate equipment delivery and installation with all other trades.

D. Contractor takes all responsibility for equipment damage incurred before, during and after installation, until Substantial Completion has been determined by Architect.

1.10 COORDINATION

A. Coordinate existing equipment with Owner per Part 3 Existing Equipment.

B. Coordinate with other trades to ensure existing equipment is disconnected prior to removal by this contractor. Supply and install all necessary drain traps, steam traps, vents, shut-offs, valves, pipe fittings, and/or other materials to complete final plumbing and electrical or steam connections between the rough-in and the connection or connections on each piece of equipment.

C. Ductwork and ductwork connections from hoods unless otherwise indicated.

D. Install all drain fittings, tailpieces, faucets, operating switches, and/or starters.

E. Coordinate sequencing of equipment installation with other trades prior to installing any piece of equipment.

F. Coordinate special conditions with other trades, i.e. floor depression, soda line conduit requirements, roof curbs, control wiring, etc.

1.11 WARRANTY

A. Provide a one (1) year parts and labor guarantee on all new equipment and a 5-year parts guarantee on refrigeration components.

B. Components of equipment subject to replacement prior to one year's use and those items which may fail due to

improper or inadequate periodic maintenance by the Owner/Operator are not intended to be included within the scope of warranty.

C. For all commercially manufactured equipment that has refrigeration systems and semi- hermetic compressors, furnish an additional four (4) year warranty on all compressors.

D. Guarantee/Warranty period shall commence with the date of Substantial Completion.

E. Warranty includes all costs incurred for removal and re-installation of the replacement component or equipment.

PART- 2 PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. All products shall be new. Use salvaged materials only where specifically directed to do so.

3. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

4. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

5. Where products require color selection the Architect will make the selection.

6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

7. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product

B. Product Selection Procedures:

1. Products:

a. Non-restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in

"Comparable Products" Article for consideration of an unnamed product.

2. Manufacturers:

3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on

Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.

5. Samples, if requested.

6. All comparable products consideration must be submitted at the time of bidding. All other considerations after time of bid will not be considered.

2.3 MATERIALS / PRODUCTS OF MANUFACTURED EQUIPMENT

A. All like types of equipment such as all refrigerated and heated cabinets, all ovens and all mixers shall be by the same manufacture.

B. Except as may be specified otherwise under individual item specifications in the “Equipment Schedule,” all items of standard manufactured equipment shall be complete in accord with manufacturer’s standard specifications for specific unit or model called for including finishes, components, attachments appurtenances etc. except as follows

1. All items of standard equipment shall be that manufacture’s latest model at time of delivery.

2. Substitutions for manufactured equipment specified will be accorded consideration under terms set forth in “Comparable Products”.

C. Fabricated equipment Details are to be followed unless otherwise noted or specified.

1. Stainless steel shall be US standard gauges as called for 18-8 or 304 type, #4 finish.

2. Galvanized iron shall be Armco or equal. Framework of galvanized iron shall be welded construction having weld smooth and where galvanizing has been burned off, touched up with high grad aluminum

bronze

3. Legs and cross rails shall be continuously welded, unless otherwise noted, and ground smooth

4. Bottom of legs at floor shall be fitted with sanitary stainless steel bullet type foot, with not less than 2' adjustment, unless otherwise specified.

5. Legs shall be fastened to equipment as follows:

    a. To sinks by means of closed gussets, Gussets shall be stainless steel, reinforced with bushing, having set screws for securing legs.

    b. To tables and drainboards with closed gussets which shall be welded to stainless steel hat sections or channels, 14 gauge or heavier, exposed hat sections having closed ends.

6. Bracing shall be welded to underside of tops

7. Closed gussets shall be 3" minimum diameter at top, continuously welded to frame members or to sink bottom

8. Sinks, unless otherwise specified shall be furnished with rotary type waste outlets without overflows where exposed furnish wastes chromium plated

9. Rolls shall be 1 – ½" diameter, except as detailed contrary, with corners bullnose ground and polished

10. Seams and joints shall be shop welded. Welds to be ground smooth and polished to match original finish.

11. Metal tops shall be one-piece welded construction, unless specified otherwise, reinforced on underside with stainless steel hat sections or channels welded in place. Cross bracing to be not more than 30" on centers. Sound deaden required.

12. Drawers to be 18 gauge stainless steel channel type housing and drawer cradle, both housing and cradle being reinforced and welded at corners, housing being secured to underside of table top and both housing and cradle being sized for and fitted with 19 gauge 20" x 20" x 5" deep stainless steel drawer insert having coved corners. Drawer insert shall be easily removable from cradle without tools or having to remove entire drawer. Drawers to have stainless steel fronts, provide with recessed flush type stainless steel pulls with locks keyed the same unless otherwise specified.

    a. Support drawer on fabricated 14-gauge stainless steel interlocking channel solid Delrin ball bearing wheels. Support slides shall be load rated at 20 lb. per pair. Slides to be component Hardware S52 Series.

13. Enclosed cabinet type bases shall be made of formed steel sheets reinforced with formed steel sections to create a ridged structure. Steel shall be 18 gauge or heavier. Base shall be welded construction throughout with front rails. Mullions, etc. welded to appear as one-piece construction. All exposed sections of interior and exterior shall be stainless steel.

14. Doors shall be double cased, unless otherwise noted. Outer pans shall be 18 gauge with corners welded ground sooth and polished. Inner pans shall be 20 gauge, fitted toughly not outer pan with sound deadening material such as Celotex used as ore. Two pans shall be tack welded together with seam solid filled.

a. Door shall finish approximately ¾" thick and shall be fitted with flush recessed type stainless steel door pulls. Single pan type doors shall be reinforced and stiffened with closed hat sections.

b. Hinged doors shall be flush type mounted on heavy duty stainless steel piano or concealed hinges.

c. Hardware shall be solid materials and except where unexposed or specified contrary, of cast brass chrome plated. Stampings are not acceptable. Identify all hardware with manufacturer's name and number so that broken or worn parts may be ordered and replaced.

15. Fabricate sink compartments, with fully coved vertical and horizontal corners. Multiple compartment partition to be double thickness continuously welded sheet join at top. Front of multiple compartment sinks to be continuous on exterior. Bottoms shall be creased to drain.

16. Ends of all fixtures splash backs shelves, etc. shall be finished flush to walls or adjoining fixtures with enclosed splash.

17. Dish table drain tables, splash backs and turned up edges shall have radius bends in the all horizontal and vertical corners, coved at intersections

a. Rounded and coved corners or radius bends shall be ½" radius or longer

18. Shelves in fixtures with enclosed bases shall be turned up on back and sides and feathered slightly to insure tight fit to enclosure panels. Bottom shelves shall be made for easy removal unless otherwise noted.

a. Undershelves of tops to be coated with heavy bodied ruinous material compound for permanent, not flacking adhesion to metal. 1/8" thick, applied after reinforcing members have been installed drying without catching crevices.

19. Metal components, unless specified or noted otherwise to be the following gauges

a. Counter and table tops 14-gauge stainless steel Wall shelves, pipe leg undershelves, drawer fronts and legs, 16-gauge stainless steel, Enclosed cabinet bases, exhaust hoods, and out pan doors 18-gauge stainless steel. Sinks and drainboards, 14 guage stainless steel. Doors, inner pan 20-gauge stainless steel.

20. Heating equipment wherever electrical heating equipment or thermostat control for such equipment is specified. It shall be complete and of the materials size and rating specified with in equipment item or details. All such equipment shall be designed and installed to be easily cleaned or to be easily removed for cleaning.

a. Electrical appliances or heating element circuits for 120 volts shall not exceed 1560 watts, unless specifically shown contrary.

21. Switches and controls, shall be supplied by food service equipment contractor on each motor driven appliance or electrical heating unit suitable control switch of proper type in accord with underwriter's code.

a. All internal wiring for fabricated equipment items included, all electrical devices wiring controls switches, etc. built into or forming an integral part of these items shall be furnish and install by food service equipment contractor in his factory or building site which all items complete to

junction box for final connections to building lines by electrical contractor

b. Provide standard 3 prong plugs to fit “U” slot grounding type receptacles, similar to NO 5262 for all equipment items powered by plugin into o110-120 volts, single phase AC. Proved suitable length 3 wire cord for equipment

c. All equipment shall be complete with connection terminal as standardized by equipment manufacturers, expect where specified otherwise

22. Fit all doors when possible for refrigerated compartment with locking type latches, Provide master keys.

23. Laminated plastic whenever specified shall be Formica, Wilson – Art, Micarta or approved by architect. Veneer all material using urea base cement, waterproof and heatproof, Rubber base adhesives are not acceptable. Apply material directly over closed grained plywood such as mahogany or birch. Standard fir plywood is not acceptable. Face exposed surfaces and edges with 1/16” material and corresponding back faces with 1/32” reject material. Place top sheet on and over finished edge.

24. Gas equipment to be suitable for use with gas available at site and to be furnished FSEC with pressure regulators designed to work with incoming pressure.

    a. Where specified gas quick disconnects shall be furnished complete with gas valve, gas connector hose, quick disconnect fitting elbows, and restraining cable all AGA approved. Gas hose shall be flexible, braded or corrugated stainless steel with smooth plastic exterior coating or sleeve of heat shrink tubing.

25. Solid surface mater to be by Corian or Surell and approved by architect. Countertops at hot food areas shall be able to withstand 175 degree without deformation, cracking otherwise deteriorating. Color and pattern to be selected after bidding

    a. Installation shall be by a qualified install as approved by manufacturer and owner

    b. Contractor to submit bid based on ½” thick material, price group “E” (mid range), Colors to be selected after award of contract.

D. Sheet Steel: ASTM A446; 1.25 ounce per square foot galvanized coating.

E. Stainless Steel: ASTM A167; Type 304 commercial grade, No. 4 finish.

F. Glass: 3/16-inch float conforming to ASTM C1036 and ASTM C1048; exposed edges ground; cut or drilled to receive hardware.

G. Plastic Laminate: NEMA LD3; 0.050-inch-thick; color as selected by Architect.

H. Laminate Backing Sheets: LD3-BK20, 0.020-inch-thick, unfinished plastic laminate.

I. Finish Hardware: Manufacturer’s standard.

J. Work Surfaces: As specified.

K. Fittings: Sink drains with crumb cup and waste fittings, faucets, and electrical outlets.

L. Service Outlet Covers and Escutcheons: Stainless steel.

M. Service Accessories and Connections:

1. Provide control switch or starter on each motor-driven appliance or heating element, under provisions of UL requirements.

2. Provide internal wiring for equipment, including electrical devices, wiring controls, and switches to a common junction box.

3. Provide suitable length of 4 wire cord with plugs to match building receptacles.

4. Provide lamps for fixtures in equipment.

5. Provide equipment with connection terminals, so that connections of plumbing, gas, steam, electrical, ventilation, and refrigeration services can be made. Where receptacles are specified for custom equipment, supply cut-outs and outlet boxes set in place accessible for connections of electrical work.

2.4 EQUIPMENT

A. Provide rough-in hardware, supports and connections, attachment devices, closure panels, trim strips, and all accessories required for proper operation of equipment.

B. Standard of Comparison: The specified equipment has been established to set a standard of quality and features.

C. If substitutions require different utility/building conditions, electrical, plumbing, ventilation, etc., from those specified, a complete list of those changes for each item shall be included with the request for substitution. Any costs associated with these changes will become the responsibility of this Contractor.

D. Verify direction of door swings.

2.5 FABRICATION

A. General Requirements:

1. Stainless Steel Fastenings and Fittings: Bolts and screws with countersunk flat heads at interior and exterior visible or accessible surfaces. Use concealed fastenings where possible

2. Form edges smooth. Fabricate sheet material for work surfaces, facings, shelves, and drainboards of straight length in one continuous sheet when not over 12 feet in length.

3. Fix leg-mounted units by dowelling to floor with 1/4-inch stainless steel pins, where vibration or oscillation is anticipated.

4. Provide legs with stainless steel adjustable feet. Fasten legs to equipment securely and rigidly.

5. Install rubber or nylon button feet or other protective device on bearing surface of any item positioned on a finished surface.

6. Isolate rotating or reciprocating machinery to prevent noise and vibration.

7. Provide accommodation for installation of final connections by other trades and accessibility to components such as compressors, junction boxes, etc…

8. Grind welds of stainless steel smooth and flush; polish to match adjacent surfaces.

9. Cut and drill components for service outlets and fixtures.

10. Provide access panels where required to access utilities.

11. Shop assemble work where possible.

B. Load Carrying Counter Surfaces: Reinforce frame support system and surfaces so that surfaces may safely support a load of 200 pounds concentrated on one square foot in any area or surface with no indentation showing on surface, and with permanent set not exceeding 0.005 inches.

2.6 FINISHES

A. Metal (Except Stainless Steel): Degrease and phosphate etch followed by primer and minimum 2 coats factory baked epoxy enamel, color as selected by Architect from manufacturer's full range of standard and custom colors.

B. Plastic Laminate: Color as selected by Architect from manufacturer's full range of standard and custom colors.

C. Stainless Steel: Number 4 finish (unless indicated otherwise).

D. Bituminous Paint: Sound deaden internal surfaces of metal work and underside of metal counters and sinks.

PART- 3 EXECUTION

3.1 EXAMINATION

A. Verify all existing conditions and existing equipment requirements.

B. Verify ventilation outlets, service connections, and supports are correct and in required location.

C. Verify operational condition of existing equipment.

D. Report equipment discrepancies or non-operational equipment to the Architect.

3.2 INSTALLATION

A. Use anchoring devices appropriate for equipment and expected usage.

B. Verify equipment is installed in accordance with the manufacturer's recommendations and requirement.

C. Insulate to prevent electrolysis between dissimilar metals. Provide sealant to achieve clean joint without

crevices.

D. Weld and grind joints in stainless steel work tight, without open seams, where necessary due to limitations of sheet sizes or installation requirements.

E. Sequence installation and erection to ensure mechanical, plumbing and electrical connections are achieved in an orderly and expeditious manner.

F. Cut, fit, and patch where necessary. Coordinate work with other trades.

G. Cut and drill tops, backs or other elements for service outlets, fixtures, and fittings.

H. Provide access panel or cutting and patching of items of this Section required for the installation or services of equipment.

I. Remove and reinstall existing equipment required under this Section. Foodservice Equipment contractor shall verify condition of existing equipment prior to removal, if being reinstalled by this contactor or reused by Owner.

J. Protect new and existing equipment during construction phase as required to prevent damage to equipment.

3.3 EXISTING EQUIPMENT

A. The Owner reserves the right to keep any existing equipment, coordinate with Owner on removal and transportation of equipment to a location of their choice. It shall be the responsibility of this contractor to salvage equipment the Owner chooses not to retain.

B. MEP disconnections by related trades, move, store and re-install equipment, ready for utility connection.

C. Coordinate scope of work and timeline with Owner and other trades prior to removal of existing equipment.

D. Clean and re-furbish existing equipment to be re-used to “like new” condition, as noted.

E. It is the responsibility of this contractor to provide storage as required until the piece of equipment is installed or re-installed.

3.4 ADJUSTING

A. Upon completion of installation, adjust new and existing equipment and apparatus to ensure proper working order and conditions.

B. If a new piece of equipment is not functioning properly and determined to be non-repairable in the field it shall be removed and replaced with a new piece of equipment.

C. Inspect all equipment and run each piece of equipment through a complete operating cycle to verify that equipment is fully operational.

3.5 CLEANING

A. Remove masking or protective covering from stainless steel and other finished surfaces.

B. Remove all packing materials and debris from jobsite.

C. Wash and clean new and existing equipment.

D. Polish glass, plastic, hardware and accessories, fixtures and fittings.

3.6 DEMONSTRATION AND TESTING

A. Test existing and new equipment prior to demonstration.

B. At completion of work, provide qualified and trained personnel to demonstrate operation of each item of equipment and instruct Owner in operating procedures and maintenance.

C. Individuals performing demonstration shall be fully knowledgeable of all operating and service aspects of equipment.

D. Start-up, test, and adjust new equipment. Authorized factory technicians shall start-up equipment requiring testing and balancing, i.e. hoods, pulping systems, equipment with remote components, etc.

PART- 4 LISTING OF FOOD SERVICE EQUIPMENT

4.1 ITEM 001 – Hot/Cold Food Well Unit

A. Vollrath Company, Model FC-6HC-0208-AD (or equal) Hot/Cold Food Multi-Well Unit, Drop-in, Electric, individual pan design, with drain, (3) pan size for 12" x 20" pans, (1) control box, thermostatic hot controls for each well, stainless steel, 6400 watts hot, 2800 watts cold, NSF & UL listed. Provide each with the following

1. 1 ea. 1-year warranty parts and labor
2. 1 ea. Electric to be verified (208v/60/1-ph, 10.2 amps)
3. 1 ea. Model 4358000-2 Control Panel Mounting Frame
4. 4 ea. Adapter Bars

4.2 ITEM 002 – Electric Fryer

A. Vulcan, Model 1ER50C (or equal), electric, (1) 50 lb. oil capacity full tank, 16 gauge stainless steel tank, front & sides, Computer Control Digital Read Temperature, 1-1/4” full port ball type drain valve, twin fry baskets, under-fryer drawer filtration, NSF, CE, CSA Star, EnergyStar. Provide with the following:

1. 1 ea. 1 year parts and labor warranty
2. 1 ea. Electric to be verified (480v, 50/60Hz, 3 phase, 17kw, hardwired connection)
3. 2 ea. Stainless steel tank covers

4. 1 set Adjustable Casters, 6" adjustable swivel non-lock rear & lock front casters

5. 1 ea. Extra Set of Twin Fry Baskets (6-1/2”w x 13-1/4”d x 6”h)

6. 1 ea. Large Single Fry Basket (13”w x 13-1/4”d x 5-1/2”h)

7. 1 ea. 10” High stainless steel removable splash guard

4.3 ITEM 003 - Hand Sink

A. Advance Tabco Model 7-PS-62 (or equal) Dimensions: 13(h) x 17.25(w) x 15.25(d) Hand Sink, wall model, 14" wide x 10" front-to-back x 5" deep bowl, 20-gauge 304 series stainless steel, splash mounted gooseneck faucet, knee valve, basket drain, wall bracket, NSF, cCSAus Paper towel & Soap dispensers by Owner. Provide each with the following:

1. 1 ea. Model 7-PS-10 P-trap, heavy duty, 1-1/2", 17 gauge

4.4 ITEM 004 - Toaster

A. Waring Commercial Model CTS1000 (or equal) Dimensions: 13(h) x 15-1/2(w) x 19.5(d) Heavy duty Conveyor Toaster, Super high output (450 slices per hour), brushed stainless steel construction, cool touch side panels, conveyor speed control NSF & UL listed. Provide each with the following

1. 1 ea. 1-year parts and labor warranty

2. 1 ea. Electric to be verified (120v/60/1-ph, 15.0 amps)

3. 1 ea. Model 7-PS-10 P-trap, heavy duty, 1-1/2", 17 gauge

4.5 ITEM 005 – Single Door Reach-In Freezer

A. True Manufacturing Co., Model T-23F-HC (or equal) Dimensions: 88.5(h) x 27(w) x 29.5(d), reach-in, self-contained capillary tube refrigeration, stainless steel exterior, clear coated aluminum interior, full-height solid doors, interior safety shielded lighting, electronic controller w/digital display, 1/2 hp, cUL, UL, NSF. Provide with the following:

1. 1 ea. Standard warranty (for the United States & Canada Only): 3-year parts and labor; 5-year compressor

2. 1 ea. Electric to be verified, 115v/60/1-ph, 3.7 amps, cord, NEMA 5-15P

3. 1 ea. Verify door hinge, factory installed to correct side, standard

4. 1 set Frame rail fitted casters, swivel, with locks on front set (4" diameter rubber tires) set of 4 (4" height)

5. 2 ea. Additional Shelves

4.6 ITEM 006 – Refrigerated Chef Base

A. Avantco Refrigeration, Model CBE-36-HC 36” (2) drawer (or equal) Dimensions: 25.825(h) x 36.325(w) x 32.125(d), automatic electric defrost, digital temperature control, removable magnetic drawer gaskets, 132lb. drawer capacity, stainless steel exterior, cUL, UL, NSF. Provide with the following:

1. 1 ea. Standard warranty (for the United States & Canada Only): 3-year parts and labor; 5-year compressor

2. 1 ea. Electric to be verified, 115v/60/1-ph, 4 amps, cord, NEMA 5-15P.

4.7 ITEM 007 - 36” Griddle

A. Vulcan, Model HEG36E (or equal) Dimensions: 15.3(h) x 36(w) x 24(d) HEG Series Heavy Duty Electric Griddle, 1/2" thick polished steel plate, manual controls, 4” stainless steel back and tapered side splashes, 3-1/2” wide front grease trough empties into large capacity grease drawer, 4" adjustable legs, heavy duty chromed thermostat knob guards, CSA Star, NSF. Provide with the following:

1. 1 ea. 1-year limited parts & labor warranty, standard

2. 1 ea. Electric to be verified, (480v, 50/60Hz, 3 phase).

3. 1 ea. Cutting board

4. 1 ea. Condiment rail

5. 1 ea. Banking strip

4.8 ITEM 008 – Sandwich Unit

A. True Manufacturing Co., Model TSSU-48-12D-2-HC (or equal) Dimensions: 36.75(h) x 48.3(w) x 30.1(d), self-contained capillary tube refrigeration, stainless steel exterior, clear coated aluminum interior, (2) adjustable shelves, 11.75” full depth composite cutting board, Heavy-duty stainless steel drawer slides and rollers, 5” diameter casters with locks on front, CSA Star, NSF. Provide with the following:

1. 1 ea. Standard warranty (for the United States & Canada Only): 3-year parts and labor; 5-year compressor

2. 1 ea. Electric to be verified, (115v/60/1-ph, 4 amps, cord, NEMA 5-15R).

3. 1 ea. Sneeze guard

4. 1 ea. Single overshelf

5. 1 ea. Exterior rectangular digital temperature display (factory installed)

6. 10ea. Pan dividers

4.9 ITEM 009 – Electric Fryer Holder

A. Vulcan, Model FrymateVX15 (or equal), electric, Free standing, 18 gauge stainless steel cabinet, Stainless steel sloped drain top with removeable grease collector (dishwash safe), grease strip brackets NSF, CE, CSA Star, EnergyStar. Provide with the following:

1. 1 ea. 1-year parts and labor warranty

2. 1 ea. Electric to be verified (120v/60/1-ph, 9 amps, cord, NEMA 5-15P)

3. 1 lt. Factory to supply cord & plug

4. 1 set Adjustable Casters, 6" adjustable swivel non-lock rear & lock front casters

5. 1 ea. ThermoGlo Food Warmer

6. 1 ea. Stainless steel tank cover

4.10 ITEM 010 – Refrigerated Display Case

A. Federal Industries, Model CGR3642 Dimensions: 42(h) x 36.13 (w) x 35.31(d), curved glass styling, tempered Thermopane tilt-out front glass, steel base construction, thermometer, removable scratch-resistant & rustproof white display deck, adjustable temperature control, light switch, adjustable leg levelers, 300k LED top light and shelf lights, UL Safety, UL Sanitation, NSF, cUL, DOE 2017. Provide with the following:

1. 1 ea. Standard warranty (for the United States & Canada Only): 3-year parts and labor; 5-year compressor

2. 1 ea. Electric to be verified (120v/60/1-ph, 4 amps, cord, NEMA 5-15P)

3. 2 ea. Glass Shelves

4. 1 ea. Rear wrapping board

5. 1 ea. Reflective ends

6. 1 ea. White Interior

7. 1 ea. Castor Unit

4.11 ITEM 011 – Pastry Display Case

A. Cal-Mil Plastic Products Inc., Sierra Square Pastry Case, Model 3610, Dimensions: 21(w) x 17(d) x 23.25(h), (3) 13 x 18 clear trays, vintage frame and wood base.

4.12 ITEM 012 – Turbo Chef

A. Turbo Chef, Model i5 Touch (or equal), stainless steel front & top & sides, 304 stainless steel interior, 7-inch capacitive touch screen with tempered glass cover, Integral recirculating catalytic convertor for UL listed ventless operation, top-launched microwave system, Smart voltage sensor technology, self-diagnostics, cUL, UL, EPA 202, NSF. Provide with the following:

1. 1 ea. 1-year limited parts & labor warranty, standard
2. 1 ea. Electric to be verified, (208/240v, 60Hz, 3-ph, 26amps)
3. 1 ea. MDD-1005: Additional Year (PhD SAAS)
4. 1 ea. MDD-1001 Initial Equipment connectivity parts
5. 1 ea. Aluminum paddle (NGC-1478)
6. 1 ea. Bottle Oven Cleaner (105704)
7. 1 ea. Bottle Oven Guard (105703)
8. 2 ea. Trigger Sprayers (103182)
9. 2 ea. PTFE Baskets (NGC-1331)

4.13 ITEM 013 – Salad Bar Unit

A. Beverage-Air, Model SPE60HC-S (or equal) Dimensions: 36.8(h) x 60.6(w) x 30.1(d), stainless steel front & top & sides with finished back, clear coated aluminum interior, (12) 4" deep 1/3 size polycarbonate pans, Locking divider bars, Self-closing doors with 120˚ stay-open feature, on cartridge style hinges, 6" Casters (2) with brakes, (4) epoxy-coated steel wire shelves, cUL, UL, NSF. Provide with the following:

1. 1 ea. Standard warranty (for the United States & Canada Only): 5-year parts and labor; 7-year compressor
2. 1 ea. Electric to be verified, (115v/60/1-ph, 5.4 amps, cord, NEMA 5-15P).
3. 1 ea. Sneeze guard panel for single side service
4. 1 ea. Foldable tray slides
5. 1 ea. Low profile casters
6. 1 set Shelf dividers

7. 2 sets Pan supports

8. 1 set Door locks

9. 1 ea. Tray slide

4.14 ITEM 014 – Sneeze Guard

A. BSI, Model DECO-101-N (or equal), Vertical Operator-Serve Food Shield, Size as indicated on plan and schedule, NSF. Provide with the following:

1. 1 ea. Chrome Finish

2. 1 ea. 1" Square tube

3. 1 ea. ¼" tempered glass panels

4. 1 ea. Undercounter installation (square tube)

5. 2 ea. ¼" tempered glass end panels.

4.15 ITEM 015 – Coffee Brewing System

A. Wilber Curtis Company, Model TP15T10A1100 (or equal) Twin server, 3-gallon total (1.5gal. per side), G3 digital control module, 3/8" water source inlet, cUL, UL, NSF. Provide with the following:

1. 1 ea. 1-year limited parts & labor warranty, standard

2. 1 ea. Electric to be verified, (220v/60/1-ph, 24 amps, hardwired connection).

4.16 ITEM 016 – Coffee Dispensing System (2 each)

A. Wilber Curtis Company, Model TXSG15 ThermoProServer (or equal) Twin server, 1.5gal. per side, Provide with the following:

1. 1 ea. 1-year limited parts & labor warranty, standard

4.17 ITEM 017 – Undercounter Double Door Refrigerator

A. True Manufacturing Co., Model TUC-36-HC (or equal) Dimensions: 29.75(h) x 36.3(w) x 30.1(d), self-contained capillary tube refrigeration, stainless steel exterior, clear coated aluminum interior, Each door fitted with 12" long recessed handle, Positive seal self-closing doors with 90° stay open feature, UL, NSF. Provide with the following:

1. 1 ea. Standard warranty (for the United States & Canada Only): 3-year parts and labor; 5-year

compressor

2. 1 ea. Electric to be verified (115v/60/1-ph, 2.0 amps, cord, NEMA 5-15P)
3. 2 ea. Barrel locks (factory installed). Requires one per door.
4. 1 set 2-1/2" diameter casters (to allow fit under countertop)
5. 1 ea. (4) Adjustable PVC coated wire shelves
6. 1 ea. Exterior rectangular digital temperature display (factory installed)
7. 1 ea. SPEC1 package

4.18 ITEM 018 –Iced Coffee Dispensing System

A. Bunn-O-Matic Corporation, Model TDO-N-4 (or equal) Narrow Iced Beverage Dispenser, 4.0 gallon, Integrated lid retainer, integrated drip tray NSF . Provide with the following:

1. 1 ea. 1-year limited parts & labor warranty, standard
2. 1 ea. Drip Tray (Model No. 39626.0000)
3. 1 ea. Faucet Assembly (Model No. 03260.0003)
4. 1 ea. Drip Tray Cover (Model No. 39627.0000)
5. 1 ea. Replacement Lid (Model No. 39624.0000)
6. 1 ea. TDO-N Locater Guide (Model No. 39696.0000)

4.19 ITEM 019– Ice Drink Dispenser

A. This item is to be furnished by Owner

B. Contractor to coordinate installation and provide all connections as required, inclusive but not limited to piping, wiring, drains, etc.

4.20 ITEM 020 – Exhaust Hood

A. Manufacturer: Halton Company

1. Model #: KVE- PSP Wall Mounted
2. Description: Exhaust Hood
3. Dimensions: As shown on plans with a typical hanging height of 6'-8" above finished floor. Remote

Switch panel with Fan and light switches shall be remote mounted, verify location with Architect.

4. Furnish and install a complete kitchen exhaust canopy. The hood shall be an Exhaust canopy. Halton Model KVE-PSP Wall Mounted style as manufactured by the HALTON Company of Scottsville, Kentucky. The canopy shall bear either the ETL or Underwriters Laboratories U.L. label, for listed range hood without exhaust fire damper per standard 710 and be fabricated in compliance with NFPA-96-2001 and shall bear the National Sanitation Foundation seal of approval.

5. All exposed surfaces shall be 18-gauge stainless steel with a #4 brushed finish, double shell end walls and face construction. **Single wall construction will not be permitted. Hood shall be UL Listed and labeled for "zero clearance" at the end(s) of the hood as shown on drawings when mounted against a wall.** Unexposed surfaces are 18-gauge stainless steel. The installation shall be in accordance with the manufacturer's recommendations and conform to NFPA-96 guidelines and all applicable local codes. The hood height shall not exceed 24"H. The overall lengths of the hoods shall be as indicated on drawings and/or equipment schedule. Use of Capture Walls to create a seal between cooking equipment and wall shall not be used as they require cooking equipment to be located further from wall reducing isle space. Bottom edge of hood front panels to be square, chamfered front shall not be allowed as they reduce front overhang and jeopardize capture and containment over tall cooking equipment. **The use of S/S end panels shall not be permitted.** Hood to include s/s trim panels from top of hood to finished ceiling on all open sides. Hood shall be tapered as shown on contract drawings.

6. Seams and joints shall be welded liquid tight in accordance with National Fire Protection Association (NFPA) bulletin #96. Exposed external welds shall be ground and polished to match original material finish. The hood shall be Underwriters Laboratories (UL) Listed 710. Construction shall conform to the requirements of National Sanitation Foundation (NSF) standard 2 and the NSF seal shall be displayed on the front face of the hood. Hanger brackets shall be threaded ½-13 and located on approximately five foot centers.

7. Hood will include an active internal "Capture-Jet" System on all open sides of the hood that will allow for Capture and Containment of thermal plume at specified air volumes. The Capture Jet air shall be pulled into a 1" air plenum with the Capture-Jet fan and discharged through Capture-Jet ports that are located along the inside front, side and bottom edge of the hood at discharge velocity of 1800 FPM. Slot type, passive devices or "Short-Cycle" discharge is not acceptable.

8. Hood shall include recessed MUA ceiling plenums and diffusers extending 24" wide and entire length of the hood front as shown on drawings with a white powder coat finish to match the drop ceiling tiles in the kitchen. MUA plenums shall not exceed 150CFM/per lineal foot of plenum using 28% open perforation diffuser material to reduce possibility of air disturbance along the front edge of the hood.

9. Each canopy shall have a filter housing of the same material as the canopy liner. The filter housing shall be equipped with a concealed drip tray the full length of the canopy and with a grease cup for easy removal and daily cleaning. The hood shall be equipped with Halton KSA (High Efficiency) multi-cyclone Stainless Steel grease extractors. The KSA filters shall be NSF and UL classified. The particulate extraction efficiency is 93% on particulates of 5 microns and 98% on particles with a diameter of 10 microns or larger per ASTM F2519 method of test. The pressure loss over the extractor shall not exceed 0.50 inches W.C. at flow rates approved by UL for heavy load cooking. Sound levels shall not exceed an NC rating of 55. Baffle, adjustable or slot type extractors shall not be acceptable.

10. The airflows through the KSA extractors and the Capture Jet air chamber are to be determined through the integral T.A.B. (Testing and Balancing) ports located on the outside end of the exhaust plenum inside each hood section. It is the responsibility of the air balancer to adjust the exhaust volumes after installation with a Magnahelic Gauge or Shortridge Digital Anemometer and the hood TAB ports to match the Pressure vs Air Flow Curves card provided in each hood section.

11. The exhaust airflow will be calculated based on the convective heat generated by the appliances underneath each canopy. Submittal shall include convective heat calculations base on the input power of the appliance served and efficiency of hood system consistent with results of independent test based on ASTM Standards F-1704-05 Capture & Containment and F-2474-05 Heat Gain to Space. Final air volume calculations shall comply with the hood listing. The use of end panels or rear seals to achieve required airflows are not acceptable.

12. An illuminated hood light button and exhaust fan on/off button to be provided by hood manufacturer and installed flush mounted under the front lip of the hood as shown on contract drawings for ease of access.

13. Hood shall be provided with hood mounted temperature sensor and timer panel designed and installed to automatically activate the exhaust fan whenever cooking operation occurs. The activation of the exhaust fan shall occur through and interlock with the cooking appliances, by means of heat sensor, per IMC 2006 507.2.1.1 requirements.

14. Each hood shall be equipped with Halton Culinary LED Lights (HCL). Constructed from stainless steel frame and Aluminum hosing, the light fitting comprises flush mounted broad beam spots with a diffusion angle of at least 80°. Each light is comprised of a patented mixing chamber and a specific reflector. Both shall provide a good balance between direct and diffuse light components without dazzling the staff to mitigate eye fatigue. The shielding angle shall exceed DIN 12464-1 requirement and be at least 30°. The illuminance on the working surfaces shall be 50-foot candles with a CRI Color Rendering Index greater than 80. The wattage per fixture will be 14W, and provide code required 50-foot candles at the cooking surface. The LED's lifetime shall be 50,000 hours. The internal power supplies shall have at least the same lifetime. They shall enable switching on/off or dimming the light (0-100%) with one or several switches. The lights shall be supplied with vapor proof, grease proof, and heat proof UL-listed designed specifically for commercial kitchen hood application.

15. All light fixtures shall be wired in a concealed manner to a junction box on top of the hood for connection to the light switch. All wiring is in accordance with the National Electric Code (NFPA 70).

4.21 ITEM 52– Fire Protection System

A. Ansul R-102 (or equal) Ansul Fire Protection System

1. The hoods shall include factory installed complete Ansul R-102 fire suppression system. System shall include Ansul test and permit fees. The Ansul system cabinet shall be located as shown on contract drawings. Wiring from Ansul tanks located in cabinet to manual pull stations to be done by Contractor in field.

2. Ansul R-102 fire extinguishing system shall protect kitchen hood against grease fires by a completely automatic fire control system of the wet chemical type.

3. Fire detection system shall be capable of detecting fire in the hood, duct, or surface equipment and shall automatically discharge liquid extinguishing agent into the plenum chamber, exhaust duct collar, and cooking appliances areas to ensure against re-ignition or re-flash.

4. System components shall include a spring-loaded release mechanism, agent tank brass nozzles with blow off caps and stainless steel (chrome-plated) appliance drops, fusible link detector, wall mounted emergency pull stations, wall mounted Automan and cabinet, and a mechanical gas valve installed in the gas line serving the cooking equipment (valve provided by fire protections system manufacturer and installed in gas line by plumber.)

5. System installation shall be done by an authorized representative of the system manufacturer and conform to UL 300 requirements and local codes.

6. Automatic actuation shall be by means of fusible with no visible conduit. System shall include an electrically actuated release mechanism.

7. Microswitches shall be furnished as part of the fire protection system for tie in of building alarm and for makeup air/fire/fuel shut down.

8. All access openings, holes, sleeves, chases, etc., in building structure necessary to permit piping and control tubing to be run between system unit, ventilator and duct work are to be provided by the Contractor.

9. The Contractor is to furnish a control relay to detect operation of the system by connection to the microswitches supplied. The Contractor is to furnish and install all wiring required for the system specified.

10. All exposed piping and nozzles of fire protection system shall be chrome or Stainless steel sleeved.

11. All horizontal piping is to be done on the top of the ventilator unless otherwise specified.

12. Verify location of remote manual pull station.

13. Contractor to provide shunt trip breaker.

4.22 ITEM 022 – Cup Dispenser / Lid Organizer

A. Serve-Sense, KleanTake, Countertop cup and lid dispenser, 8-slot, Dimensions: 12.25(w) x 23.8(d) x 25.5(h), color: black, Cup-capacity 8 - 44oz., Gasket dispenser mechanism, adjustable.

4.23 ITEM 023– Point-of-Sale Unit

A. This item is to be furnished by Owner

B. Contractor to coordinate installation and provide all connections as required, inclusive but not limited to power, data, etc.

4.24 ITEM 024 – Equipment / Work Table

A. Custom Model by MARLO: (or equal) Size and shape as shown on drawings (approximately 50”(l) x 30”(d) x 36” high). Table shall be constructed of 14-gauge 304 stainless steel top with fully enclosed 6” high backsplash. Provide channel underbracing, cross bracing and sound deaden top. Provide with a tier of three (3) S/S drawers. 24” wide 16-gauge two tier over shelf remaining length of table, mounted on S/S tubular uprights with concealed fasteners. NSF & UL Listed.

4.25 ITEM 025– Shelving Units – (2Lot) Required

A. Four tier Metro Model A----NK3 (or equal) Super Adjustable Super Erecta® Shelf, wire, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF.

B. Each shelving unit shall have four (4) Model 74PK3 (or equal) Super Erecta® SiteSelect™ Post, 74-5/8"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3™ epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection. Shelving shall be provided as shown on drawing (No “S” clips allowed), it shall be the responsibility of this contractor toverify and adjust shelving sizes to insure proper fit.

PART- 5 CONDITIONS

5.1 EXISTING CONDITIONS:

A. It is the responsibility of this contractor to fully review the existing conditions of the building and the new kitchen location. This contractor shall be familiar with access to the kitchen location, including equipment access by elevators, stairwells, corridors, openings, including access around the exterior of the building for a crane or hoisting equipment (if required). It will be the responsibility of this contractor to coordinate equipment installation with the owner, CM, GC, etc.

PART- 6 DETAILS OF CONSTRUCTION

6.1 DETAIL DRAWINGS

A. The following details are a part of these specifications and shall be referred to for additional design requirements:

END OF SECTION 11 4000

PART- 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to other sections of the specification, drawings and details to determine type and extent of work there is affecting the work of this section, whether or not such work is specifically mentioned in this section. It is the intent of this specification to include all labor and material required to complete this section whether or not it is clearly or explicitly shown.

1.2 SUMMARY

A. Work Included

1. Plastic laminate wood cabinets.

1.3 QUALITY ASSURANCE

A. Kitchen Cabinet Standard: ANSI A161.1.

B. Field Measurements: Verify cabinet dimensions to field measurements, finish wall to finish wall.

1.4 SUBMITTALS

A. Product Data:

1. Submit manufacturer's technical product data and installation instructions indicating materials, hardware and finishes used in fabrication of kitchen cabinets as required to show compliance with specifications.

B. Shop Drawings:

1. Submit shop drawings indicating location and size of each type of cabinet, accessories, materials, finishes, hardware types and locations, fillers, etc. Including fully dimensioned plans and elevations and indicate details of anchorage to countertop and to walls.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect cabinets during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver cabinets until painting, wet work, grinding and similar operations, which could be performed before installation of cabinets, have been completed in installations areas.

1.6 JOB CONDITIONS

A. Conditioning:

1. Comply with cabinet manufacturer's recommendations for temperature and humidity requirements in cabinet installation areas. Do not install cabinets until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

2. Maintain temperature and humidity in installation areas as required to maintain moisture content of installed cabinet work within a tolerance range of the optimum moisture content acceptable to cabinet manufacturer, from date of installation through remainder of construction period.

PART- 2 PRODUCTS

2.1 MANUFACTURERS

A. Custom Millwork:

1. Style: Similar to existing cabinetry which is to be removed, plastic laminate as per details on drawings.

2. Plastic Laminate

a. Manufacturer: Wilson Art

b. Color: Silver Oak Ply #8203

c. Grain Orientation: Vertical

2.2 MATERIALS

A. Accessories:

1. Heat Shield Strips use where doors are near heat producing appliances.

2. Door Pulls

a. Liberty 3in Stainless Steel, model #P13456L-SS-U1

3. Frame Hinge – Soft close.

4. Shelf Pin – PINSHLF

B. All other accessories as may be required.

PART- 3 EXECUTION

3.1 INSPECTION

A. Inspect substrate and conditions under which cabinets are to be installed. Do not proceed until all unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install cabinets plumb, level, true and straight with no distortions. Shim as required using concealed shims. Where kitchen cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips and molding as indicated or required and in finish to match cabinet face.

B. Anchor cabinet securely in place with concealed (when door and drawer are closed) fasteners, anchored into structural support members of wall construction. Comply with manufacturer's instructions for support of units.

C. Complete hardware installation and adjust doors and drawers for proper operation.

3.3 CLEANING AND PROTECTION

A. Repair or remove and replace defective work as directed upon completion of installation.

B. Clean exposed and semi-exposed surfaces, touch-up finish as required. Remove and refinish damaged or soiled areas.

END OF SECTION 12 3530