SECTION 02668

FIRE WATER SYSTEMS

PART I -- GENERAL

1.01 DESCRIPTION

Work in This Section: Work includes, but is not limited to:

1. Fire water system with all appurtenances, complete, tested, and ready for service. Contractor shall make "Hot Tap" in accordance with the requirements of "Local Governing Agency" for domestic water systems.
2. Contractor shall furnish and install all piping, valves, fittings, etc. as shown on the plans, as specified herein, and as required to make the on-site fire water system completely operational.
3. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.

1.02 QUALITY ASSURANCE

A. Perform all work in accordance with applicable provisions of "Uniform Plumbing Code", current Edition, International Association of Plumbing and Mechanical Officials, Los Angeles, California (UPC), and "standard for the Installation of Private Fire Service Mains and their appurtenances", NFPA 24.

B. Underground Conduit Construction shall be in accordance with Section 306 of "Standard Specifications for Public Works Construction", current Edition, published by Building News, Inc., Los Angeles, California (PWC Specifications).

C. Disinfection of on-site water system shall be in accordance with American Water Works Associates (AWWA) Standard C601.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

A. Submittal: List of proposed materials, accompanied by manufacturers latest printed literature with technical data.

B. Certificates: Manufacturers certification that materials meet specified requirements.

1.05 SEQUENCING OF CONSTRUCTION

A. Protect existing water service facilities and other existing utilities in place.

B. Install fire water system as soon as conditions permit other facilities and improvements to follow.

C. Comply with City Fire Marshall's requirements prior to bringing combustible materials onto construction site.

D. Install tops of manholes, junction chambers, vaults, boxes, valve boxes, etc., unless otherwise specifically indicated on the drawings, to an elevation 3" below rough grade and raise to final elevation after paving.

1.06 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility location. Verify that water system piping may be installed in accordance with original designs and proposed standards.

1. Locate water system piping and verify new work to be performed in conjunction therewith. If any pre-existing damage to any portion of the existing water system is discovered, report it in writing to the Owner's Representative prior to start of any work connected with or in the area of the damaged portion. Repair or replace any damaged existing water system or portion thereof, which is not reported as described herein, at no additional cost to Owner.

2. Where new water mains connect to existing system, excavate, carefully expose and verify horizontal and vertical locations of all points of connection. Notify Architect of any discrepancies. Perform all such required exploratory work far enough in advance of water system construction to allow for Architect to redesign piping required to meet existing conditions. No time delays will be allowed due to failure of Contractor to perform this work early enough in his construction period. Any water system, which must be reconstructed due to failure of Contractor to verify grades, must be completed at no additional cost to Owner.

3. Verify conditions required for connection to exist Rancho California Water District main. If night shutdown of existing main or other special arrangements is required, perform the work at no additional cost to owner.

B. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soils Engineer, modify trench/backfill conditions, materials, or methods, all at no additional cost.

PART 2 -- PRODUCTS

2.01 WATER SYSTEMS

A. Pipe:

1. Polyvinyl Chloride (PVC 1120) pressure pipe shall conform to AWWA C-900; Class 150 (DR 18) with elastomeric-type sealing rings in bell-and-spigot joints. Pipe shall be UL and NSF-61 listed.

2. Ductile Iron pipe, AWVVA C-151, with cement mortar lining complying with AV\ANA C-104, Class 51, unless otherwise indicated.

3. Concrete cylinder pipe, AWWA C-301.

4. Steel pipe, AVVWA C-200, with cement mortar lining and coating, AV\IWA C-205, Type V.

B. Fittings:

1. PVC and Ductile Iron Pipe Fittings: AV\IWA C-1 10 or C-153, cement lined with rubber gaskets per AWWA C-111.

2. Reinforced Concrete Pipe Fittings: As manufactured for concrete cylinder pipe.

3. Steel Water Pipe Fittings: AVMA C-208; welded joints per AVMA C-206.

C. Valves:

1. Line-size gate valves, UL-listed, 175 psi working pressure, resilient wedge gate valve with non-rising stem, unless otherwise specified, with inside screw and

shall open to the left or counter clockwise. Valves shall be equipped with double O-ring stem seals with both rings located above the collars or with Johns-Manville "Duro" packing, Style No. S-171, or approved equal, cut to fit in separate rings with staggered joints. Valves shall have the manufacturers name, catalog number and marking pressure molded or stamped thereon in places where the name and number may be easily seen when the valves are installed. Valves shall be painted as specified in Section 27, AWWA Specifications C-500. Valves shall be furnished complete with accessories. Valve joints shall be in accordance with all applicable requirements specified for joints and shall be for buried service.

2. Valve boxes: Unless otherwise specified, the following options may be provided. All valve box covers shall have 'WATER" cast in the top using sharp faced letters of 1" minimum height:

   a. Cast iron, slip adjustment type of appropriate size for valve. Alhambra or approved equal.

   b. Pre-cast concrete with cast iron cover. Brooks 3-RT series or approved equal.

D. Fire Hydrants: James Jones Model J-3765 with (1) 4" and (2) 2-1/2" outlets per Water District requirements.

E. Air release valves: Per Water District requirements.

F. Double Check Detector Check Assembly: Per Water District requirements.

G. Accessories: Provide anchorages for tees, crosses, plugs, and caps, bend valves and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages. Clamps, straps and washers, steel, ASTM A-506; steel rods per ASTM A-575. Rod couplings shall be malleable iron: ASTM A-1 97. Steel bolts per ASTM A-30-1.

H. Thrust blocks: Per Water District requirements.

I. Marker Tape: Manufacturers standard permanent bright blue continuous-printed plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read, "CAUTION - WATER LINE BURIED BELOW'.

PART 3-- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FIELD CONDITIONS

A. Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Correct improper conditions.

B. Coordinate all work of this section with related trades.

C. All water used on this project must be delivered through a Water District construction meter obtained and paid for by the Contractor, who will be responsible for the cost of all construction water, including that used for loading of new lines, testing, flushing and disinfecting.

3.03 TRENCH EXCAVATION, BEDDING, AND BACKFILL

A. Perform all trench excavation and all additional excavation required for vaults or other structures forming a part of the pipeline. Trench excavation and backfill shall conform to the requirements of Section 02220 of these specifications and Section 306-1.2 of the PWC Specifications and shall require the approval of the Soils Engineer.

B. Bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of not less than 30 or have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10

C. Bedding shall be compacted to 90 percent of the Maximum Relative Density.

D. In backfilling the trench, take all necessary precautions to protect the pipe from damage due to shifting.

E. Bury marker tape directly above pipe, 6" to 12" below finished surface of trench backfill.

3.04 CONNECTIONS TO EXISTING MAINS

Connection to existing public main will be per Water District Standard. Contractor shall coordinate this work with the Water District and shall install the service lateral and double check detector check per the water district standards and as shown on contract drawings. All work in public right-of-way shall be in accordance with City Standards. Obtain and pay for encroachment permits from City for all work in City right-of-way.

3.05 PIPE LAYING, JOINTING AND TESTING

A. Survey line and grade: Provide grade controls and survey lines in accordance with Section 01055.

B. Pipe installation: the Inspector will inspect Pipe in the field before and after laying. Any corrective work shall be approved by the Inspector at no cost to the Owner. Installation of pipe shall conform to the requirements of Section 306.1.2 of the PWC Specifications.

C. Install concrete thrust blocks against undisturbed soil, or other restraining devices is detailed, at bends, tees, crosses, valves, pipe ends and where changes in pipe diameters occur at reducers or in fittings.

D. Flush system in accordance with NFPA 24.

E. Testing of pipelines: Perform all test required by governing agencies. Testing shall be performed in accordance with Section 306-1.4 of PWC Specifications. Furnish all water, materials, and labor for making the required tests. All tests shall be made in the presence of the Inspector. Notify the Inspector at least 48 hours before performance of the required tests.

F. Disinfection: Before acceptance of the onsite fire water system, each unit of completed voter line shall be disinfected by an approved testing fin-n hired by the Contractor as prescribed in AWWA Standard C601. The disinfection and testing procedures shall continue at the contractors expense until tests indicate that satisfactory bacteriological results have been obtained. The testing firm shall provide a certificate of compliance to the Architect that the unit tested met the AWWA requirements.

3.06 DEFECTIVE WORK

Repair or replace defective work no additional cost to the Owner.

3.07 ACCEPTANCE BY LOCAL GOVERNING AGENCY

Prior to final acceptance of the work obtain approval of the double check detector check installation from the governing Water District and submit copies of the Certificates of Completion to the Inspector for forwarding to the Owner.

3.08 CLEAN-UP

Upon completion of work, leave the site clean and dear of debris and construction materials.

***** END OF SECTION *****

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SECTION 02720

SITE DRAINAGE

PART I -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work In This Section: Contractor shall furnish and install site drainage systems as indicated on the drawings and as required to make the system completely operational. Work in this section includes, but is not limited to:

1. Furnishing and laying storm drain piping and fittings.
2. Bedding
3. Drainage, structures
4. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications

1.03 QUALITY ASSURANCE

Comply with all requirements of the Governing Agency.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Product Data: Submit manufacturers technical data and installation instructions for the following:
   1. Pipe materials.
   2. Frames, grates, and covers.
   3. Pre-cast concrete drainage structures.
   4. Cleanouts and other miscellaneous drainage structures.

B. Record Drawings: Submit record drawings of installed storm drain system.

C. If either spiral ribbed or corrugated metal pipe is to be used, submit test results certifying a minimum 50-year service life for the pipe in accordance with the requirements of this section.

1.06 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility location. Verify that storm drain piping may be installed in accordance with original designs and proposed standards.

B. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soil Engineer, modify trench/backfill conditions, materials or methods, all at no additional cost.

PART 2 -- PRODUCTS

2.01 PIPE MATERIALS: Unless a specific pipe option is indicated on the Plans, the following pipe options may be used:

A. Reinforced Concrete Pipe (RCP): Conform to ASTM C76 Class III and the applicable provisions of the PWC Specifications.

1. Polyvinyl Chloride (PVC) Plastic Piping:

2. Pipe and Fittings shall conform to ASTM D3034, shall have a Standard Dimension Ratio (SDR) of 35, and shall have ends suitable for elastomeric gasket joints.

3. Joints and Jointing Material: Joints shall conform to ASTM D3212. Gaskets shall conform to ASTM F477.

B. Corrugated Metal Pipe (CMP): CMP shall conform to section 207-11 PWC Specifications. It shall have 2-2/3" x 1/2" helical corrugations, with coupling bands of same material as pipe. All pipes shall be fully lined with an asphalt or concrete lining. Coupling bands, bolts and nuts shall be galvanized, t = 0.064".

C. Spiral Ribbed Galvanized Steel Pipe: t = 0.064" PWC Specifications, Section 207-11 except for corrugation and fabrication requirements. Ribbed steel pipe shall have a continuous helical rib and a continuous helical lock seam with the rib spaced midway between seams. The rib shall be 3/4" wide by 1" high projecting outward from the surface of the pipe. Rib pitch along the spiral shall not be greater than 11-1/2". The continuous helical lock seam shall be fabricated in accordance with the requirements in Section 207-11.3.3, PWC Specifications. All pipes shall be fully lined with an asphalt or concrete lining. Couplings bands for ribbed steel pipe shall conform to the requirements in Section 207-11.2.2.

D. If either spiral ribbed or corrugated metal pipe is to be used, the contractor shall obtain and pay for services of a licensed testing laboratory which shall obtain soil samples from the site and perform chemical and resistivity tests to determine the projected service life of the pipe. The contractor shall submit test results, for Architect's approval, certifying a minimum 50-year service life for the pipe.

E. Cast Iron Pipe: Hub and spigot cast iron soil pipe and fittings, ASTM A74 for compression gasket joints. Service Class, extra heavy with gaskets, ASTM C564.

2.02 DRAINAGE STRUCTURES

A. Concrete for catch basins, culverts and other drainage structures shall be 560-C-3250 or 56G-3-3250, unless otherwise specified.

B. Forms for concrete drainage structures shall be rigid and substantial. Plywood or tongue and grooved lumber shall be used for forming the exposed faces of all concrete drainage structures.

C. Pre-cast concrete catch basins: As manufactured by Brooks Products, Inc., or an approved equal.

D. Planter drains and small-diameter cleanouts (up to 8") shall be cast iron with black paint all exposed surfaces, as detailed. Acceptable manufacturers include Alhambra, Smith, Josam, Wade, and Zurn.

2.03 MISCELLANEOUS

A. Frames and Gates: Conform to the drawings and to the requirements of ASTM A48, Class 3.

B. Marker Tape: Manufacturers standard bright green continuous-printed detectable plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read, "CAUTION-STORM DRAIN BURIED BELOW'.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 BEDDING

A. Excavate trenches as indicated on the drawings and/or specified elsewhere. Keep trenches clean until installed work has been approved.

B. Bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of not less than 30 or have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10

C. Bedding shall be compacted to 90 percent of the Maximum Relative Density, unless otherwise specified.

3.03 PIPE INSTALLATION

A. Install pipe in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated.

B. Inspect pipe before installation to detect apparent defects. Mark defective materials and promptly remove from site.

C. Lay bell, hub or groove ends upgrade, accurately centering adjoining spigots in them so as to provide an unbroken continuity of invert.

D. Install gaskets in accordance with manufacturers recommendations for use of lubricants, cements, and other special installation requirements.

E. Unless otherwise indicated, lateral connections to main lines and angles in lines shall be made with the use of 45-degree wyes.

F. Reinforced Concrete Pipe: Lay and bed in accordance with the applicable provisions of the American Concrete Pipe Association's "Concrete Pipe Field Manual", unless otherwise indicated.

G. Polyvinyl Chloride Pipe: Install in accordance with manufacturers instructions.

H. Corrugated Metal Pipe or Spiral Ribbed Galvanized Steel Pipe: Install in accordance with manufacturers instructions, unless otherwise indicated.

I. Unless otherwise shown, match soffits at all storm drain connections, laterals, cleanouts, etc.

J. Bury marker tape 6" to 12" below finished grade, directly above pipe. Only required on 8" and larger lines.

3.04 DRAINAGE STRUCTURES

A. Construct catch basins, cleanouts, and other drainage structures at locations, and to the design and dimensions indicated. Exposed concrete work shall have a smooth troweled finish with rounded comers and edges finished plumb and true. Provide grates, frames and covers as required on the plans and specified in this section.

B. Forms shall be kept in place not less than five days after placing, unless otherwise directed or approved. Concrete mark shall be cured in accordance with Division 3.

C. Pre-cast concrete catch basins shall be installed to the dimensions and elevations indicated or, the drawings.

3.05 PROTECTION

Drain lines, including trenches, shall be protected from damage during the entire construction period. It shall be the responsibility of the Contractor to replace or remark any damaged portion of the work at his own expense until such time as the project is accepted.

3.06 CLEAN-UP

A. Upon completion of the work, all storm drain systems shall be left free from silt, debris and obstructions.

B. Clear dirt and other superfluous material from interior of pipe as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. In large, accessible conduit, brushes and brooms may be used ford cleaning.

C. Place plugs in ends if uncompleted conduit at end of day, or whenever work stops.

D. Flush lines clean with water after installation is complete.

E. Remove and dispose of existing storm drain facilities as required.

3.07 OPERATIONAL TESTING

A. Perform all testing required by public agencies having jurisdiction for all or part of the work.

B. Perform all testing required by these specifications and drawings, to the satisfaction of the Architect.

C. In addition to other tests, perform the following tests to the satisfaction of the Inspector, and, if requested, the Architect and Owner:

1. Flow-Test roof drain connecting lines with a 3/4" water hose connected to a hose bibb or garden valve; run water at full force for a minimum of 5 minutes. The roof drain receptor and building drain line will be tested in the same manner as the plumbing system.

2. Flow-Test all other drains using the following criteria:

a. Flow-test gutters and area drains with a 3/4" water hose connected to a hose bibb or garden valve. Run water for a minimum of 5 minutes.

b. Flow-test all catch basins connected to a line 6 inches or larger with a minimum 500gallon deluge of water over a five-minute period.

***** END OF SECTION *****

SECTION 02730

SANITARY SEWERS

PART 1 -- GENERAL

1.01 DESCRIPTION

A. Work In This Section: Contractor shall furnish and install all piping, manholes, cleanouts, etc. as shown on the plans, as specified herein, and as required to make the on-site sanitary sewer system completely operational. Work includes, but is not limited to:

1. Sanitary Sewer System to points of connection 5 feet outside of buildings, unless otherwise shown on the plans.
2. Connection to existing systems.
3. Manholes and Cleanouts
4. Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications

B. Related Work Not In This Section:

1. Section 01055: Field Engineering
2. Section 02220: Excavating, Backfilling and Compacting
3. Section 02752: Asphalt Concrete Paving
4. All other site utilities, such as Drainage, Water, Gas, Electric, Irrigation, etc.

1.02 QUALITY ASSURANCE

A. Perform all work in accordance with applicable provisions of "Uniform Plumbing Code", current Edition, International Association of Plumbing and Mechanical Officials, Los Angeles, California. (UPC), and current standards of the local Water District.

B. Underground Conduit Construction shall be in accordance with Section 306 of "Standard Specifications for Public Works Construction", current Edition, published by Building News, Inc., Los Angeles, California (PWC Specifications).

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

A. Material List: Submit a list of material proposed for use for approval.

B. Provide written certification that the entire system is clean and free of obstructions.

C. Record Drawings: Submit record drawings of installed sanitary sewer system in accordance with Section 01720.

PART 2 -- PRODUCTS

2.01 PIPE MATERIALS: Unless a specific pipe option is indicated on the plans, the following options may be used:

A. Extra strength vitrified day pipe: Conform to ASTM C700. Compression joints shall conform to ASTM C425.

B. ABS plastic solid wall pipe: Per ASTM D2751 and PWC Specifications, Section 207-15 as modified therein. Joint solvent cement shall be an ABS cement conforming to ASTM D2235. Gaskets shall conform to PWC Specifications, Section 208-4.

C. Polyvinyl Chloride (PVC) Plastic Sever Pipe: Conform to ASTM D3034, SDR 35. PVC sewer pipe shall have gasketed joints conforming to the requirements of PWC Specifications, Section 208-4.

2.02 CONCRETE MANHOLES

A. Concrete manholes, unless otherwise specified, shall conform to the specifications referenced on the plans.

B. Manhole covers shall be marked "SEWER".

2.03 CLEANOUTS

Cleanouts to grade shall be constructed of the same material and same size as associated line; terminate at surface in a concrete or cast iron body with tight-fitting cast iron or brass top. In paved area, top to be traffic-rated; in walks, lawns or planters surface to be smooth, non-tripping. "SEWER" shall be cast into cover in sharp 1" high letters.

2.04 MARKER TAPE

Manufacturers standard permanent bright green, continuous-printed plastic tape intended for direct burial; not less than 6" wide x 4-mil thickness. Black print shall read "CAUTION-SEVVER LINE BURIED BELOW'.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FIELD CONDITIONS

A. Verify drawing dimensions and elevations with actual field conditions. Inspect related work and adjacent surfaces. Correct all improper conditions.

B. Coordinate all work of this section with related trades. Immediately notify Architect should conflicts with other utilities be encountered.

C. Perform all work within the Road right-of-way in accordance with traffic and detour plan approved by the City. Provide all required traffic control devices and personnel. Perform night work if required at no additional cost to Owner.

D. Verify elevation(s) of point of connection to existing main prior to construction. Where new sanitary sewers connect to existing sewers, excavate carefully, expose and verify horizontal and vertical location of all points of connections. Notify Architect of any discrepancies. Perform all such required exploratory work far enough in advance of sewer construction to allow Architect to redesign sewers as required to meet out-fall conditions. No time delays will be allowed due to failure of Contractor to perform this work early enough in the construction period. Any sanitary sewer, which must be reconstructed due to failure of Contractor to verify grades, must be completed at no additional cost to Owner.

E. Verify and coordinate installation locations to assure clearance from all other utilities and from footings and foundations. Pay particular attention to structural details pertaining to piping installations with respect to foundations. Where utilities fall within the zone of influence of footings or foundations as shown on these details, deepen footings, relocate piping, or, if approved by the Soils Engineer, modify trench/backfill conditions, materials or methods, all at no additional cost to the Owner.

3.03 TRENCH EXCAVATION, BEDDING, AND BACKFILL

A. Perform all excavation for the construction of trenches and all additional excavation required for manholes or other structures forming a part of the pipeline. Trench excavation and backfill shall conform to the requirements of Section 02220 of these specifications and Section 306-1.2 of the PWC Specifications and shall require the approval of the Soils Engineer.

B. Bedding material shall normally extend from 3" below the pipe invert to a point 1 foot above the top of the pipe. Bedding material shall be a mixture of sand, gravel, crushed aggregate or approved native material. Bedding material shall have a sand equivalent of not less than 30 or have a coefficient of permeability greater than 0.001 centimeters per second. Bedding material shall be sized within the following range:

Sieve Size:	Percent Passing:
3/4"	100
No. 4	35 - 65
No. 200	0-10

C. Bedding shall be compacted to 90 percent of the Maximum Relative Density.

D. In backfilling the trench, take all necessary precautions to protect the pipe from damage due to shifting.

3.04 PIPE LAYING, JOINTING AND TESTING

A. Survey, line and grade: Provide grade controls and survey lines in accordance with Section 01055.

B. Pipe installation: the Inspector will inspect Pipe in the field before and after laying. Any corrective work shall be done by the Contractor and approved by the Inspector at no cost to the District. Installation of pipe shall conform to the requirements of Sections 306-1.2 of the PWC Specifications.

C. Unless otherwise specified, match soffits at all sewer connections, laterals, manholes, etc.

D. Bury marker tape 6" to 12" below finished grade, directly above pipe.

E. Testing of pipelines: Perform all tests required by governing agencies. Testing shall be performed in accordance with Section 306-1.4 of PWC Specifications. Furnish all water, materials and labor for making the required tests. All tests shall be made in the presence of the Inspector. Notify the Inspector at least 48 hours before performing the required tests.

3.05 CONNECTIONS TO EXISTING MAINS

Connect on site sewer system to existing system. Comply with all requirements of governing Water District and the City for work within the public right-of-way.

3.06 CLEAN-UP

A. Upon completion of work, all sanitary sewer systems shall be left free from silt, debris, and obstructions.

B. Clear dirt and other superfluous material from interior of pipe as work progresses. Maintain swab or drag in line and pull past each joint as it is completed.

C. Place plugs in ends of uncompleted conduit at end of day or whenever work stops.

D. Flushing of lines: Prior to acceptance of work, flush each line to ensure that the entire system is clean and free of all obstructions.

***** END OF SECTION *****

SECTION 02835

CHAIN LINK FENCES & GATES

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work Included: Provide chain link fence system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures for the Work.

PART 2 -- PRODUCTS

2.01 DIMENSIONAL DATA

General:

1. Pipe sizes indicated are commercial pipe sizes.
2. Tube sizes indicated are nominal outside dimensions.
3. H-section sizes indicated are normal flange dimensions.
4. Roll-formed section sizes indicated are the nominal outside dimensions.

2.02 GALVANIZING

On steel framework and appurtenances, provide galvanized finish with not less than the following weight of zinc per square feet.

1. Pipe: 1.8 oz., complying with ASTM A120.
2. H-sections and square tubing: 2 oz., complying with ASTM A123.

3. Hardware and accessories: Comply with Table 1 of ASTM A153.

4. Fabric: 2.0 oz., complying with Class II of ASTM A121.

2.03 FABRIC

A. Provide number 9 gage or 0.148" wires in 2" mesh, with top and bottom salvages twisted and barbed.

B. Provide fabric in one-piece widths.

2.04 POSTS, RAILS, AND ASSOCIATED ITEMS

A End, corner, slope, and pull posts: Provide at least the following minimum sizes and weights:

Material and dimensions	Lbs. per Lin. Ft.
Pipe, 2.875" outside dimension	5.79

B Line posts: Provide minimum sizes and weights as follows:

Material and dimensions	Lbs. per Lin. Ft.
Pipe, 2.875" outside dimension	3.65

C Gate posts: Provide gate posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:

Material and dimensions	Lbs. per Lin. Ft.
Pipe, 4" outside dimension	9.10

1. Over 13 feet wide, and up to 18 feet wide, use 6.625" outside diameter pipe weighing 14.0 lbs. per linear foot.

2. Over 18 feet wide, use 8.625" outside diameter pipe weighing 24.70 lbs. per linear ft.

D Top rails:

1. Use 1.660" outside diameter pipe weighing 1.80 lbs. per linear foot, or

2. Use 1.625" x 1.25" roll-formed sections weighing 1.35 lbs. per linear foot.

3. Provide in manufacturer's longest lengths, with expansion type couplings approximately 6" long for each joint.

4. Provide means for attaching top rail securely to each gate, corner, pull, slope and end post.

E Post brace assemblies:

1. Provide at end and gate posts, and at both sides of corner, slope, and pull posts, with the horizontal brace located at mid-height of the fabric.

2. Use 1.660" outside diameter pipe weighing 1.80 lbs. per linear foot for horizontal brace.

3. Use 3/8" diameter rod with turnbuckle for diagonal truss.

F Tension wire: Provide number 7 gage galvanized coiled spring wire at bottom of fabric.

G Post tops:

1. Provide single piece steel, wrought iron, or malleable iron, designed as weather-tight closure cap.

2. Provide one cap for each post.

3. Provide caps with openings to permit through passage of top rail.

H Stretcher bars:

1. Provide one-piece lengths equal to full height of fabric, with a minimum cross-section of 3/16" x 3/4".

2. Provide one stretcher bar for each gate and end post, and two for each corner, slope, and pull post, except where fabric is woven integrally into the post.

I Stretcher bar bonds:

1. Provide steel, wrought iron, or malleable iron, spaced not over 15" on centers, to secure stretcher bars to end, corner, pull, slope, and gate posts.

2. Bands may be used also with special fittings for securing rails to end, corner, pull, slope, and gate posts.

2.05 GATES -- ROLLING

A General:

1. Fabricate gate perimeter frames of tubular members.

2. Provide additional horizontal and vertical members to assure proper operation of the gate and for attachment of fabric, hardware, and accessories.

3. Space so frame members are not more than 8 feet apart.

4. Fabricate gate frames from:

Material and dimensions	Lbs. per linear foot.
Pipe, 1.90" outside dimension	2.72

B Fabrication:

1. Assemble gate frames by welding with special malleable or pressed steel fittings and rivets for rigid connections.

2. Use same fabric as used in the fence.

3. Install fabric with stretcher bars at vertical edges as a minimum.

4. Attach stretchers to gate frame not more than 15" on centers.

5. Attach hardware with rivets or by other means which will provide security against removal and breakage.

6. Provide diagonal cross-bracing consisting of 3/8" diameter adjustable length truss rods on gates where required to provide frame rigidity without sag or twist.

C Rolling Gate Hardware: Provide following for each gate:

1. Latches:

a. Provide forked type or plunger-bar type to permit operation from either side of the gate.

b. Provide padlock eye as integral part of latch.

2. Universal Track Bracket:

a. Provide 10 gage galvanized steel brackets with 3/8" diameter galvanized J-Bolts and nuts.

3. Rear Wheels:

a. Provide 5" outside diameter, 4" diameter V-Groove, galvanized steel roller bearing wheel.

b. Anchor rear wheels to gate frame with 5/8" diameter.

4. Double Wheel Carriage:

a. Provide 1" x 2" x 14 ga. galvanizing steel tube axle with 3/8" diameter galvanized J-Bolts and 6" diameter rubber tire with galvanized steel roller bearing hub.

5. Provide locking device and padlock eyes as an integral part of the latch.

2.06 MISCELLANEOUS MATERIALS AND ACCESSORIES

A Wire ties:

1. For tying fabric to line posts, use number 9 gage wire ties spaced 12" on centers.

2. For tying fabric to rails and braces, use number 9 gage wire spaced 24" on centers.

3. For tying fabric to tension wire, use number 11 gage hog rings spaced 24" on centers.

4. Manufacturer's standard wire ties will be acceptable if of equal strength and durability.

B Concrete: Comply with provisions of Section 03300 for 2500 psi concrete.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A General:

1. Install posts at a maximum spacing of 10 feet on centers.

2. Install corner of slope posts where changes in line or grade exceed a 30° deflection.

B Excavating:

1. Drill holes for post footings in firm, undisturbed or compacted soil, strictly adhering to the dimensions and spacing shown.

2. Post hole dimensions:

3. Provide 36" deep by 9" diameter foundations for line posts.

4. Provide 36" deep by 12" diameter foundations for all other posts.

5. Spread soil from excavations uniformly adjacent to the fence line, or on adjacent areas of the site if so directed.

6. When solid rock is encountered near the surface, drill into rock at least 12" for line posts and at least 18" for end, pull, gate, and corner posts. Drill hole at least 1" greater diameter than the largest dimension of the post to be placed.

7. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed minimum depths as specified above.

C Setting posts:

1. Remove loose and foreign materials from sides and bottoms of holes, and moisten soil prior to placing concrete.
2. Center and align posts in hole.
3. Place concrete around posts in a continuous pour, and vibrate or tamp for consolidation.
4. Check each post for vertical and top alignment, and hold in position during placement and finishing operations.
5. Trowel tops of footings, and slope or dome to direct water away from posts.
6. Extend footings for gate posts to the underside of bottom hinge.
7. Set keeps, stops, sleeves, and other accessories into concrete as required.
8. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing material or other curing method accepted by the Architect.
9. Grout-in those posts which are set into sleeved holes, concrete constructions, or rock excavations, using non-shrink portland cement grout or other grouting material accepted by the Architect.

D Concrete strength:

1. Allow concrete to attain at least 75% of its minimum 28-day strength before rails, tension wires, and/or fabric is installed.
2. Do not, in any case, install such items in less than seven days after placement of concrete.
3. Do not stretch and tension fabric and wire, and do not hang gates, until concrete has attained its full design strength.

E Rails and bracing:

1. Install fence with a top rail and bottom tension wire.
2. Install top rails continuously through post caps or extension arms, bending to radius for curved runs.
3. Provide expansion couplings as recommended by the fencing manufacturer.
4. Provide bracing to the midpoint of the nearest line post or posts at all end, corner, slope, pull, and gate posts.
5. Install tension wires parallel to the line of fabric by weaving through the fabric, and tying each post with not less than number 6 gage galvanized wire, or by securing the wire to the fabric.

F Installing fabric:

1. Leave approximately 2" between finish grade and bottom salvage.
2. Excavate high points in the ground to clear the bottom of the fence.
3. Place and compact fill to within 1" of the bottom of the fabric in depressions.
4. Pull fabric taut and tie to posts, rails, and tension wires.

5. Install fabric on outward side facing side of fence, and anchor to framework so that the fabric remains in tension after pulling force is removed.

6. Install stretcher bars by threading through or clamping to fabric on 4" centers, and secure to posts with bands spaced 15" on centers.

G Installing gates:

1. Install gates plumb, level, and secure for full opening without interference.

2. Install ground-set items in concrete for anchorage in accordance with the fence manufacturer's recommendations as accepted by the Architect.

3. Lubricate and adjust the hardware for smooth operation.

H Miscellaneous:

1. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two full turns.

2. Bend ends of wire to minimize hazards to persons and clothing.

3. Fasteners:

4. Install nuts for tension band and hardware bolts on side of fence opposite fabric side.

5. Peen the ends of bolts to prevent removal of nuts.

6. Repair coatings damaged in the shop or field erection, using a hot-applied repair compound applied in accordance with its manufacturer's recommendations as accepted by the Architect.

*****END OF SECTION*****

SECTION 02870

SITE FURNISHINGS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Work included: Provide bollards, benches, picnic tables, bar-b-que units, trash receptacles and drinking fountains as shown and specified on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 RELATED WORK

Site Concrete.

1.04 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.06 SUBMITTALS

Product Data: Within 45 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Cut sheets and product data of items proposed to be provided under this Section;
2. Erection procedures, sequence of erection, and required handling equipment.

PART 2 -- PRODUCTS

2.01 BOLLARDS

A. Furnish: size(s), color(s), pattern(s) and shape(s) as indicated on the drawings.

B. Manufacturer: as indicated on the drawings or Architect approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Coordinate rough-in for electrical and embed requirements with other trades.

B. Confirm locations with Owner and Architect in field.

3.03 INSTALLATION

A. Install items per manufacturer's recommendations.

B. All items to be secured in place to limit vandalism.

3.04 CLEAN-UP

Wipe clean all surfaces and protect from work of other trades.

*****END OF SECTION*****

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SECTION 02980

90-DAY MAINTENANCE

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. These specifications establish the standard for the maintenance of the landscaping for the (90) ninety days following completion of landscape installation.

B. The Contractor shall furnish all labor, equipment, materials, tools, services and special skills required to perform the landscape maintenance as set forth in these specifications and in keeping with the highest standard of quality and performance.

C. Maintenance of these areas shall include maintenance of plant materials and irrigation system. Maintenance of plant materials shall include, but is not limited to, mowing, trimming and edging, pruning, fertilization, aeration, weed control, cultivation, pest control, tree surgery, thatching, plant replacement and clean-up of drainage system. It is the intent of these specifications to provide plant material maintenance methods to keep the site in a state of growth and repair. Irrigation maintenance shall include operation of system adjustment and all necessary repairs.

D. Emergency Numbers: The Contractor shall provide, at all times throughout the duration of this contract, emergency telephone numbers which can be called for emergency conditions at any time that the Contractor's representatives are not immediately available at the job site. An alternative number shall be provided in case no answer is received at the first number. The emergency number shall be used to contact a responsible representative of the Contractor who can take the necessary action required to alleviate an emergency condition that threatens to cause damage to any property.

E. Method of Payment: The Contractor shall present monthly invoices of one-third of the total amount of the 90-day contract. Payments will be made monthly and shall equal one-third of the total amount for a 90-day period, due within (30) thirty days from which service was performed.

1.03 INSURANCE, LICENSES, PERMITS

A. The Landscape Maintenance Contractor shall possess all insurance, licenses and permits required to perform the landscape maintenance.

B. Licensing Requirements: In accordance with Division II, Chapter 9 of the Business and Professions Code of the State of California, providing for the licensing of contractors, the Contractor shall possess a valid C-27 landscape maintenance license or Class A Contractor's license. In addition, the Contractor shall possess a valid chemical applicator's license to include pest control or must subcontract to a licensed contractor.

C. Contract Termination: The Owner reserves the right to terminate the contract, without penalty, for cause immediately or without cause after (30) thirty days written notice thereof is delivered to Contractor, either personally or by mail addressed as shown on the contract documents. In the event of such termination, the bond shall remain in effect for six (6) months after the date of termination to provide surety that any remedial work required at the time of termination will be completed.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

PART 2 -- MATERIALS

As required.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and condition under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 TURF GRASS AREAS

A. Mowing:

1. Mowing of lawn areas shall be done once a week, except when weather precludes mowing. Bermuda grass shall be mowed at a cutting height of 3/4" - 1". Rye grass shall be mowed at a cutting height of 1-1/2" - 2".

2. A power driven rotary mower with a grass catcher attached to remove clippings shall be used to mow turf. Blades shall be kept sharp at all times.

B. Edging and Trimming:

1. Edging shall be accomplished with a power edger each time the turf is mowed. Clippings shall either be vacuumed or blown off walks. The turf around tree wells, sprinkler heads and other objects shall be trimmed by hand clippers or a power weed-eater. (Contractor to provide weed-eater guard on all trees when weed-eaters are used.) Chemicals may be used for this purpose only with the approval of the Landscape Architect.

C. Aerification:

1. Turf grass shall be aerified once a year during the first week of August, one week prior to fertilization. Aerate all turf areas, removing 1/2"x2" cores of sod with an aerator machine at a maximum of 6" spacing. Any areas that show excessive compaction shall receive additional treatment as required to alleviate this condition and allow for proper water penetration and minimal runoff. At the discretion of the Contractor, the cores may either be dragged to break them up or removed.

D. Fertilization:

1. Apply fertilizers as indicated in Fertilization, Section 02960.

E. Watering:

1. A regular deep watering program shall be accomplished to give the best results. The established turf should not be kept wet but should dry out somewhat between waterings. Allow lawns to dry before mowing. Also see Section 02950 of Additional Work in All Areas.

F. Thatching (only if not over seeding): Thatch all Bermuda lawns once a year in early September in accordance with the following methods:

1. Verticut entire area using a thatching machine set to soil line conduct. Verticut twice in parallel directions. Pick up debris at the completion of this operation.

2. Mow with rotary mower at regular cutting height.

G. Overseeding of Perennial Rye: In mid-October (or when the evenings are consistently cool), the following overseeding services should be performed:

1. Perennial rye to be applied at a rate of 20 pounds per 1,000 square feet.

2. 15-15-15 commercial fertilizer to be applied at a rate of 6 pounds per 1,000 square feet.

H. Refurbishment of Turf Areas:

1. Lawn areas that thin out due to dryness or any other reason will be reseeded with an approved grass seed or sod, as determined by the landscape architect.

I. Weed Control:

1. Contractor shall maintain a weed-free lawn at all times by either chemical, mechanical means or by the water management program. The Contractor shall be especially careful if applying chemicals to control weeds because of possible damage to the lawn. Before such applications are made, the turf should be well established and in a vigorous condition.

J. Disease, Harmful Insects and Rodent Control:

1. Maintain areas free of pest and diseases including rodents, snails, insects, etc.

3.03 ANNUAL COLOR/GROUNDCOVER AREAS

A Fertilization

1. Apply fertilizers as indicated in Section 02950.

Shrub and groundcover areas shall be tilled only prior to pre-emergent application but raked and edged weekly or bi-monthly, and all debris removed from the areas that day. Groundcover shall be kept neat in appearance and within the intended area of planting by edging and trimming.

Keep shrubs and groundcover neatly trimmed away from sprinkler heads to allow for their proper operation and normal spray pattern. Groundcovers and vines shall be trimmed back from shrubs, trees and private property fences, as necessary. Trim and edge to maintain sidewalks and curbs free of plant growth.

B Weed Control:

1. Weeds shall be controlled so as not to reach an objectionable height. Remove weeds by chemical or mechanical means on a monthly schedule. Weed infestations of the shrub and groundcover areas, if severe, may be controlled by a commercial herbicide by obtaining written permission from the Landscape Architect. Such permission shall depend on the Contractor submitting to the Landscape Architect the following information:

2. The exact location(s) where the herbicide is to be used.

3. Verification that the herbicide has no harmful effect on desirable plant materials.

4. The herbicide will be applied at the manufacturer's instructions for application.

5. Bermuda grass infestations of the shrubs, groundcover and slope areas, if severe, should be sprayed out and "weedeaten".

C Watering:

1. A regular deep watering program shall be implemented to give the best results. The established groundcover shall not be kept wet but should dry out somewhat between waterings.

D Surface Drains:

1. The Contractor shall be responsible for periodic inspection and maintenance of surface drains located within the landscaped areas. These drains shall be checked to assure proper functioning. On a regular schedule, remove all debris and vegetation that may accumulate in these drains, including the portion under the sidewalk, to maintain the proper flow of water.

E Annual Color:

1. The Contractor shall be responsible for replacing annual color two (2) times during the year. Annual color will be replaced at the following times: 1st week in November and the 1st week in June (as weather permits).

3.04 ADDITIONAL WORK IN ALL AREAS

A. Tree Maintenance:

1. Trees shall be pruned to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which they are attached, which have vertical spacing from 18" to 48" and radial orientation so as not to overlay one another, to eliminate diseased or damaged growth, to eliminate narrow V-shaped branch forks that lack strength, to reduce toppling and wind damage by thinning out crowns, to maintain a natural appearance, to balance with roots.

2. Tree maintenance should be done on a yearly or twice yearly basis, as needed, to maintain the trees in a healthy and vigorous growing condition. A qualified tree care professional should be contracted by the Owner to perform this service on all trees 15' or greater in height. Trees under 15' in height may be maintained by the general maintenance contractor following the methods outlined below. Trees are not to be pruned to maintain an artificial height of 15' or under when the natural growth characteristics would exceed a 15' height.

3. Under no circumstances will stripping of lower branches (raising up) of young trees be permitted. Lower branches shall be retained in a "tipped back" or pinched condition with as much foliage as possible to promote caliper trunk growth (tapered trunk). Lower branches can be cut flush with the trunk only after the tree is able to stand erect without staking or other support.

4. Evergreen trees shall be thinned out and shaped when necessary to prevent wind and storm damage. The primary pruning of deciduous trees shall be done during the dormant season. Damaged trees or those that constitute a safety hazard shall be pruned at any time of the year, as required.

5. All major pruning operations will not begin until reviewed with the Landscape Architect.

6. Pruning shall be done by those experienced and skilled in pruning techniques. All cuts shall be done using proper horticultural practices. Cuts made over 1-1/2" in diameter shall be treated with a sealer.

7. Prune trees to allow for necessary clearances for pedestrian and vehicle circulation.

8. Ailing or stunted trees that fail to meet expected growth will receive additional treatments to correct any deficiencies.

9. Surface roots that become maintenance or appearance problems will be removed as required to prevent damage to adjacent areas, sidewalks and curbs.

10. Apply all required insecticides and fungicides to prevent or control plant diseases and pests.

11. Perform minor tree surgery, as required.

12. Tree stakes, ties and guys shall be checked at least monthly and corrected, as needed. Ties will be adjusted to prevent girdling. Remove stakes, ties and guys as soon as they are no longer needed. Replace broken stakes, as required.

13. To prevent the setting and eventual dropping of fruit, olive trees shall be sterilized every spring, just before flowers are at full bloom, then again 7 to 14 days later to get any late blooms. The product for this shall be "Olive Stop" or approved equal.

14. The Contractor shall be responsible for the spraying of all pine trees for spider mites four times a year. The product for this shall be Malathion followed up with a petroleum oil for overwintering adults and eggs.

B. Shrub Maintenance:

1. The objective of shrub pruning is the same as for trees.

2. Shrubs shall be pruned, as required, for safety, removal of broken or diseased branches and general containment or appearance.

3. Prune shrubs to retain as much of the natural informal appearance as possible, consistent with intended use. Shrubs shall not be clipped into balled or boxed forms unless such is required by the design.

4. All pruning cuts shall be made to lateral branches, buds or flush with the trunk. "Stubbing" will not be permitted.

5. Apply all insecticides or fungicides to control pests.

C. Loss or Damage to Plant Material by Contractor:

1. Shrubs, trees and plants damaged or killed due to the Contractor's operations, negligence or chemicals shall be replaced at no cost to the Owner.

D. Disease and Harmful Insect Control:

1. Monthly inspections shall be made for evidence of disease and/or harmful insects. If evidence of such is found, a report shall immediately be submitted to the Landscape Architect. The report shall include:

2. Exact location(s) where disease and/or harmful insects are prevalent.

3. Contractor's opinion of the type of disease and/or insect.

4. Contractor's recommendations for control and elimination of disease and/or harmful insects.

E. Pest Prevention and Control:

1. The Contractor shall be responsible for detection, prevention, elimination and control of diseases, harmful insects and weeds in the turf, shrubs, trees and groundcover areas. The Contractor shall select and supply proper materials and licensed personnel and obtain necessary permits to comply with all city, county, state and federal regulations or laws.

2. Contractor will assume responsibility and liability for the use of all chemical controls. Pests and diseases to include, but not limited to, all insects, mites and other harmful organisms.

3. Chemical controls to include necessary use of herbicides and plant growth regulators. Pests may be controlled by mechanical means, as well as chemicals.

F. Rodent Control:

1. The Contractor shall be required to hire, as subcontractor, a professional who is in business strictly for the purpose of controlling rodents. The Contractor shall be

responsible for overseeing the subcontractor to assure the control of all rodents, as required in all landscaped areas.

G. Clean Up:

1. The Contractor shall be responsible for keeping the entire area, including hardscape areas, free of debris such as papers, bottles, cans, glass, dirt, etc. Debris shall be removed Monday, Wednesday and Friday each week. Contractor shall be responsible for trash removal from the sites.

2. Contractor shall remove all debris resulting from the maintenance operations and dispose of it off-site. All grass clippings deposited on roadways or walks shall be picked up after each mowing or trimming operation.

3. All debris resulting from any of the Contractor's operations shall be removed and disposed of legally at the Contractor's expense. No debris will be allowed to remain at the end of the workday.

4. All walkways will be kept clean and care shall be taken not to create unnecessary hazards to the walking surface.

5. Unless otherwise indicated or directed, the Contractor shall provide a general clean-up operation at least once a week for the purpose of picking up debris which may accumulate from use of the area, windblown debris, dropped twigs or branches, leaves or paper in the landscape area.

H. Irrigation System:

1. Operation:

a. The water schedule will be established and programmed by the Contractor's landscape maintenance supervisor. Application rates will be based on the amount the planting areas are capable of receiving without excessive runoff. The irrigation system's schedule shall be monitored and adjusted accordingly to maintain efficient use of water being applied.

b. In determining rates of application, soil type, topography and weather conditions will be taken into consideration. The project is equipped with an automatic system that provides for repeat cycles. Applying water over short periods of time will allow for proper infiltration and thereby minimize runoff.

c. Contractor shall turn off all controllers when it is unnecessary to irrigate due to adequate rainfall.

d. Sprinkler heads shall be kept clear of overgrowth that may obstruct maximum operation.

e. Contractor will avoid manual activation of automatic valves.

f. Contractor will keep system in operation by valve or head adjustment to keep all systems operating at manufacturer's recommended operating pressures. This shall be accomplished by valve throttling and pressure gauge.

g. Contractor will be responsible for hand watering any areas not provided with an irrigation system, or any area resulting from the physical breakdown of the irrigation system.

2. Maintenance:

a. The Contractor shall be responsible for the cost of cleaning, repair, adjustment and replacement of sprinkler system components, with the exception of irrigation controllers and backflow protection devices.

b. The Contractor shall be responsible for the cost of cleaning, repair, adjustment and replacement of all items listed in the foregoing paragraphs in addition to the following:

1. Plastic Pipe
2. Plastic Pipe Fittings
3. Galvanized Steel Pipe
4. Galvanized Steel Fittings
5. Remote Control Valve Wiring
6. Remote Control Valves
7. Manual Control Valves
8. Quick Coupler Valves
9. Sprinkler Heads
10. Valve Boxes

c. Replacement of any item shall be with an item of identical design, unless otherwise specified in writing by the Landscape Architect.

1. The following specifications are provided for replacement of plastic pipe, plastic pipe fittings, galvanized steel pipe and galvanized pipe fittings:

   a. Plastic pipe shall be polyvinyl chloride (PVC) Schedule 40, Type 1, Grade 2 (PVC 1220).

   b. Plastic pipefittings and connections shall be PVC Schedule 40.

   c. Galvanized steel pipe and galvanized steel pipefittings shall be Schedule 40.

2. The Contractor shall inspect and examine the sprinkler system while water is on twice per month.

3. Any part of the system not functioning normally shall immediately be cleaned, adjusted, repaired or replaced.

4. Contractor shall be responsible for adjusting height of sprinkler risers necessary to compensate for plant material growth.

5. Automatic controllers will be kept locked at all times.

3.05 MISCELLANEOUS

A. The Contractor shall furnish and pay all costs for the following material:

1. Herbicides, pesticides and fungicides
2. Sprinkler system parts
3. Fertilizers
4. Tree stakes and ties
5. All tools and equipment to complete the work specified
6. Plant materials damaged by the Contractor
7. Annual color
8. Overseeding

B. Daily Inspection:

1. The Contractor shall be responsible for notifying Owner upon discovery of damage to facilities (i.e. drinking fountains, lighting poles and fixtures, etc.), which could be a potential health and safety hazard or could be an inconvenience to the general public.

C. Inspections will be made by Owner and the Contractor on a weekly basis and/or at the request of the Contractor. Once a month Owner, Landscape Architect and Contractor will meet. The purpose of the meeting will be to discuss specific project problems.

3.06 FERTILIZATION

A. General

1. Fertilizers shall be inorganic, dry, pelletized formation, as specified. Application shall be in accordance with indicated rates and times.

B. Method of Application

1. In making application of fertilizer granules, caution shall be taken to contain these materials in the planting areas. Avoid use of cyclone spreaders, which tend to throw material into paved areas, etc. Use gravity flow spreaders when possible to keep material contained in planting areas.

C. Timing of Application

1. When climatic factors may cause problems of general containment of fertilizer materials, adjustment of the fertilizer schedule may be necessary. Avoid application of fertilizers prior to forecasted rainy weather, etc., which might affect stability. After fertilizer application, monitor watering schedule to eliminate runoff of fertilizer materials in solution.

D. Trees and Shrubs

1. Agriform 21 grams plant tablets shall be applied to trees and shrubs that require supplemental feeding. Annual fall feeding shall be done in accordance with the rates indicated. Place tablets 6 to 8 inches deep.

PRODUCT ANALYSIS	TIME	RATE PER 1,000 S.F.
20-10-5	As required	1 gal plant - 1 tablet 5 gal plant - 2-3 tabs Mature trees - 1 tab per 1/2" of caliper

3.07 CLEAN UP

A. Contractors shall remove all debris associated with his work from the project site on a daily basis. Contractor is responsible for providing proper debris receptacles, or disposing of debris off site.

B. All receptacles or off site disposal must conform to state and local codes. Contractor is responsible for identifying any waste associated with his work which may be deemed as being "hazardous" as defined by the EPA, and disposing of it per EPA regulations.

***** END OF SECTION *****

SECTION 03100

CONCRETE FORMWORK

PART 1 -- GENERAL

1.01 DESCRIPTION

A. Work included: Provide formwork in accordance with provisions of this Section for cast-in-place concrete shown on the Drawings or required by other Sections of these Specifications.

B. Related work:

1. Section 02220: Excavating, Backfilling, and Compacting
2. Section 03200: Concrete Reinforcement
3. Section 03300: Cast-in-Place Concrete

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Design of formwork is the Contractor's responsibility.

C. Standards: In addition to complying with pertinent regulations of governmental agencies having jurisdiction, comply with pertinent provisions of ACI 347.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit manufacturers' data and installation instructions for propriety materials including form coatings, ties, and accessories and manufactured systems if used.

PART 2 -- PRODUCTS

2.01 FORM MATERIALS

A. Except for metal forms, use new materials, Materials may be re-used during progress of the Work, provided they are completely cleaned and reconditioned, re-coated for each use, and capable of producing formwork of the required quality.

B. For footings and foundations, use Douglas Fir boards or planks secured to wood or steel stakes, substantially constructed to shapes indicated and to support the required loads.

C. For studs, walls, and supports, use Standard graded or better Douglas Fir, dimensions as required to support the loads but not less than 2" x 4".

D. Wall forms:

1. Exposed concrete surfaces:

a) Use 3/4" minimum thickness Douglas Fir plywood, grade B/B, Class I or II, exterior, sanded both sides, complying with PS-1.

b) Seal edges and coat both faces with colorless coating which will not affect application of applied finishes.

2. Unexposed concrete surfaces:

a) Use 1" x 6" shiplap Douglas Fir boards, surfaced one side and two edges, or 3/4" minimum thickness Douglas Fir plywood, grade B/B plyform, Class I or II, sanded both sides, mill-oiled.

2.02 FORM TIES

Hold inner and outer forms for vertical concrete together with combination steel ties and spreaders accepted by the Architect.

1. Space ties symmetrically in tiers and rows, each tier plumb form top to bottom and each row level.
2. At horizontal pour lines, locate ties not more than 6" below the pour lines. Tighten after concrete has set and before the next pour is made.
3. For exposed concrete surfaces, provide form ties of removable type with she-bolts equipped with permanent plugs and a system accepted by the Architect for fixing the plugs in place.

2.03 DESIGN OF FORMWORK

General:

1. Design, erect, support, brace, and maintain formwork so it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure.
2. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for that purpose.
3. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position.
4. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities, and within the allowable tolerance.
5. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints, and provide backup material at joints as required to prevent leakage and prevent fins.

2.04 EARTH FORMS

A. Foundation concrete may be placed directly into meat excavations provided the foundation trench walls are stable as determined by the Architect and Structural Engineer (subject to the approval of the Office of the State Architect). In such case the minimum formwork shown on the drawings is mandatory to insure clean excavations immediately prior to and during the placing of concrete.

B. Provide additional concrete 1" on each side of the minimum design profiles and dimensions shown on the Drawings.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FORM CONSTRUCTION

A General:

1. Construct forms complying with ACI 347 to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.

2. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features as required.

B Fabrication:

1. Fabricate forms for easy removal without hammering or prying against concrete surfaces.

2. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.

3. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and assure ease of removal.

4. Provide top forms for inclined surfaces where so directed by the Architect.

C Forms for exposed concrete:

1. Drill forms to suit ties being used, and to prevent leakage of cement paste around tie holes. Do not splinter forms by driving ties through improperly prepared holes.

2. Provide sharp, clean corners at intersecting planes, without visible edges or offsets. Back the joints with extra studs or girts to maintain true, square intersections.

3. Use extra studs, walls, and bracing to prevent objectionable bowing of forms between studs, and to avoid bowed appearance in concrete. Do not use narrow strips of form material which will produce bow.

D Corner treatment:

1. Unless shown otherwise, form chamfers with 3/4" x 3/4" strips, accurately formed and surfaced to produce uniformly straight lines and tight edges.

2. Extend terminal edges to required limit, and miter the chamfer strips at changes in direction.

E Locate control joints as indicated on the Drawings and where required but not shown on the Drawings, as accepted by the Architect.

F Provisions for other trades:

1. Provide openings in concrete formwork to accommodate work of other trades.

2. Verify size and location of openings, recesses, and chases with the trade requiring such items.

3. Accurately place and securely support items to be built into the concrete.

3.03 FORM COATINGS

Coat form contact surfaces with form coating compound before reinforcement is placed.

1. Do not allow excess form coating material to accumulate in the forms or the come in contact with surfaces which will bond to fresh concrete.

2. Apply the form coating material in strict accordance with its manufacturer's recommendations.

3.04 REMOVAL OF FORMS

A. General:

1. Do not disturb or remove forms until the concrete has hardened sufficiently to permit form removal with complete safety.

2. Do not remove shoring until the member has acquired sufficient strength to support its own weight, the load upon it, and the added load of construction.

3. Do not strip horizontal concrete in less than three days.

4. Do not strip vertical concrete in less than three days.]

B. Finished surfaces:

1. Exercise care in removing forms from finished concrete surfaces so that surfaces are not marred or gouged, and that corners are true, sharp, and unbroken.

2. Release sleeve nuts or clamps, and pull the form ties neatly.

3. Do not permit steel spreaders, form ties, or other metal to project from, or be visible on, any concrete surface except where so shown on the Drawings.

4. Solidly pack form tie holes, rod holes, and similar holes in the concrete. For packing, use the cement grout specified in Section 03300 of these Specifications, flushing the holes with water before packing, screeding off flush, and grinding to match adjacent surfaces.

*****END OF SECTION*****

SECTION 03200

CONCRETE REINFORCEMENT

PART I -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 WORK INCLUDED

A. Reinforcing steel bars, welded steel wire fabric for cast-in-place concrete, fabricated, placed and supported, as specified herein and shown on the Drawings.

B. Support chairs, bolsters, bar supports, spacers, for supporting reinforcement, as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice, and Documents 63 and 65.

B. Conform to ACI 301 and 315.

1.04 SHOP DRAWINGS

A. Indicate sizes, spacings, locations and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting and spacing devices.

B. Prepare shop drawings under seal of professional structural engineer registered in the State of California.

1.05 CERTIFICATES

A. Submit mill test certificates of supplied concrete reinforcing, indicating physical and chemical analysis.

B. In lieu of mill test certificate provide samples:

1. Samples for physical tests of reinforcement will consist of at least two pieces, each 18" long, of each size of reinforcement steel, selected by the testing agency from material at the building site or at the fabricator's or supplier's yard.

2. Material to be sampled at the building site shall have been delivered thereto at least 72 hours before it is needed.

3. Where samples are taken from bundles as delivered from the mill, with the bundles identified as to heat number, and provided mill analyses accompany the report, then one tensile test and one bend test will be made from a specimen of each ten tons or fraction thereof of each size of reinforcement steel.

4. Where positive identification of the heat number cannot be made, or where random samples are taken, then one series of tests will be made from each 2-1/2 tons or fraction thereof of each size of reinforcement steel.

1.06 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Reinforcing Steel: ASTM A615, 40 ksi for #4 and smaller and 60 ksi for #5 and larger yield grade billet-steel deformed bars, uncoated finish. Deformations shall conform with ASTM A305.

B. Welded Steel Wire Fabric: ANSI/ASTM A185 plain type; in coiled rolls; uncoated finish.

C. Stirrup Steel: ANSI/ASTM A82.

D. Bending to conform to ASTM 318. Fabricate reinforcement in accordance with recommendations contained in CRSI " Manual of Standard Practices".

E. Brackets for centering vertical steel shall be similar and equal to Wall-Brac as manufactured by W.C.R. Fabricators, San Clemente. (714) 492-2370.

2.02 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place:

1. Use wire bar type supports complying with CRSI recommendations, unless otherwise shown on the Drawings.

2. Do not use wood, brick or other non-complying material.

3. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs and to prevent vapor barrier puncture.

4. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic-protected legs.

2.03 FABRICATION

A Fabricate reinforcing bars to conform to the required shapes and dimensions with fabrication tolerances complying with ACI 315, providing concrete cover specified in Section 03300. In case of fabricating errors, do not straighten or rebend reinforcement in a manner that will weaken or injure the material.

B Reinforcement with any of the following defects will not be acceptable.

1. Bar lengths, depths and/or bends exceeding the specified fabrication tolerances;

2. Bends or kinks not shown on the Drawings;

3. Bars with reduced cross-section due to excessive rusting or other cause.

C Locate reinforcing splices not indicated on Drawings at points of minimum stress. Indicate location of splices on shop drawings.

D Weld reinforcing bars in accordance with ANSI/AWS D1.4.

E Reinforcement shall be clean and shall be free from oil, excessive mill scale or rust, and shall be stored on the site in such a manner as to permit easy access for proper inspection and identification.

Reinforcement shall be shop-bent to shapes and dimensions as shown and shall be placed where indicated on the Drawings or reasonably required to carry out the intent of the Drawings and Specifications. Reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the Drawings shall not be used.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Comply with the specified standards for detail and method of placing reinforcement and supports, except as may be modified herein.

B. Clean reinforcement to remove loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.

C. Position, support and secure reinforcement against displacement by formwork, construction and concrete placing operations.

D. Locate and support reinforcement by metal chairs, runners, bolsters, spacers and hangers, as required. (Such chairs or stools shall be bound, shall have squared vertical sides, and shall conform to the requirements for Grade A concrete as specified herein.)

E. Place reinforcement to obtain minimum coverages for concrete protection.

F. Arrange, space and securely tie bars and bar supports together with the specified tie wire.

G. Set wire ties so twisted ends are directed away from exposed concrete surfaces.

H. Do not displace or damage vapor barrier required by Section 03300. If vapor barrier is damaged, Contractor shall repair or replace that section to be water resistant.

I. Install welded wire fabric in as long lengths as practicable, lapping adjoining pieces at least one full mesh.

J. Provide sufficient numbers of supports and of strength to carry the reinforcement.

K. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.

L. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

M. Wall steel shall be wired together at all points where bars cross. Splices in horizontal bars shall be staggered so that adjacent splices will not be less than 4 feet apart, unless shown otherwise on the Drawings.

N. Bars shall be continuous insofar as practical.

O. Dowels required to receive and engage subsequent work shall be of sufficient length to develop the strength of the bar and be securely set in the forms prior to placing the concrete.

P. All stirrups shall be accurately and securely wired to the bars at both top and bottom.

3.03 SPLICES

A. Lap splices: Tie securely with the specified wire to prevent displacement of splices during placement of concrete.

B. Splice devices:

1. Obtain the Architect's approval prior to using splice devices.

2. Install in accordance with manufacturer's written instructions.

3. Splice in a manner developing at least 125% of the yielding strength of the bar.

C. Do not splice bars except at locations shown on the Drawings, unless otherwise specifically approved by the Architect.

D. In general, the reinforcing steel shall be lapped at least 30 diameters.

E. A clear space equal to 2-1/2 diameters (and in no case less than 1-1/2") shall be maintained between the spliced bars, unless otherwise directed by the Architect.

F. Splices shall not be made at the points of maximum stress and where made, the splices shall be lapped as indicated on the Drawings or as otherwise required to develop the strength of the bars.

3.04 MASONRY REINFORCEMENT

A. Splices for masonry wall shall lap not less than 40 bar diameters, except where otherwise shown.

B. Vertical foundation dowels for masonry wall shall be accurately set to match reinforced masonry cells.

C. Dowels shall not be bent after foundation concrete has been placed.

3.05 WELDED WIRE FABRIC

A. Shall be rolled out, straightened, cut to size and laid in place reasonably flat.

B. Splices in wire mesh shall lap not less than 8 inches and shall be tied with No. 16 or 18 gauge wire at not more than 12 inches.

C. As concrete is placed, mesh used as reinforcement for slabs on grade shall be lifted at intervals as required to insure proper embedment in the concrete.

*****END OF SECTION*****

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

All of the requirements of the Contract Documents apply to this Section. The work under this section includes furnishing all labor, materials and equipment and performing all operations in connection with all concrete work indicated on the Drawings, specified herein or reasonably required to complete the work.

1.03 QUALITY CONTROL

A. INSPECTION: All concrete work shall be under continuous inspection by a representative of the Owner. Concrete shall not be placed until and unless all forms, reinforcement and all embedded materials have been inspected and approved by the job inspector, nor shall concrete be placed outside of regular working hours unless satisfactory arrangements have been made with the inspector and he is available to observe.

B. TESTING: It shall be the Contractor's responsibility to determine, prior to their delivery to the job site or to the batching plant, that all materials to be incorporated into the work comply with these Specifications. All costs incurred by the Contractor in complying with the above requirements, including the cost of concrete design mixes, shall be paid by the Contractor. The Owner will do such sampling and testing of materials and concrete after their arrival at the job site or batching plant as he may deem necessary, and all costs in connection therewith will be paid by the Owner. No concrete shall be placed until test results on materials to be used have been approved by the Architect.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Comply with pertinent provisions of Article 5 of the General Conditions.

B. Contractor shall submit all necessary Product Data and a complete list of material sources for all products to be incorporated into the project for review and approval of the Architect. The Performance of all Mix Designs shall be established either by stamped by an individual licensed to specify concrete mix designs engaged by Concrete Supplier or by break test data from at least 30 different projects for each mix design.

PART 2 -- PRODUCTS

2.01 CONCRETE MIX

A. All concrete mixes shall produce concrete that will work readily into corners and angles of forms and around reinforcement with the methods of placing employed on the work, but without permitting the materials to segregate or excess free water to collect on the surface.

B. If the concrete fails to conform to these Specifications, the Architect may order a change in the mix or require that a new design mix be provided.

C. All mixes shall be submitted to and approved by the Architect prior to placement of concrete. All concrete mixes except Class C shall be designed by an approved testing laboratory. However, multiple use of mix designs will be permitted to the extent indicated below. Mixes shall produce concrete conforming to the following requirements:

1. Class A Concrete: For all concrete work except where otherwise indicated on the Drawings or specified herein.

   a. Compressive strength at 28 days = 3000 pounds per square inch minimum

   b. Aggregate size = 3/4 inch maximum.

   c. Slump = 4 to 5 inches.

   d. Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Company (615) 892-7243, or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable.

2. Class B Concrete: For all slabs on grade.

   a) Compressive strength at 28 days = 3000 pounds per square inch minimum

   b) Portland Cement Content = 5-1/2 sacks per cubic yard.

   c) Aggregate size = 1 inch maximum.

   d) Water Content = Maximum water / cement ratio of 0.48.

   e) Slump = 4-1/2 to 5-1/2 inches.

   f) Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Company (615) 892-7243, or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable.

3. Class C Concrete: For piping thrust blocks, for envelopes around conduit or piping, or such other uses as may be indicated on the drawings or specified herein.

   a. Cement content = 4-1/2 sacks per cubic yard.

   b. Slump - 4 to 6 inches.

   c. Compressive strength at 28 days = 2500 pounds per square inch minimum

2.02 CONCRETE MATERIALS

A. All materials shall be delivered, stored, and handled so as to prevent the inclusion of foreign material and/or damage. Packaged materials shall be delivered and stored in original packages until ready for use. Packages or materials showing evidence of damage shall be rejected.

B. Aggregate (standard): Aggregate shall conform to the requirements of "Specification for Concrete Aggregates" (ASTM). Aggregates shall be stored and weighted separately and in a manner to avoid inclusion of foreign materials. No aggregate shall be incorporated into the work until approved by the Architect, and the source shall not be changed after such approval without written authorization from the Architect.

C. Aggregate (for exposed aggregate slabs and walks on grade): Aggregate shall be an approved washed, hard, smooth, well rounded local beach-line rock, passing a 3/4 inch screen and retained on a 3/8 inch screen.

D. Cement: All cement shall conform to "Standard Specifications for Portland Cement", ASTM Designation C-150 (latest), except where otherwise specified, and shall be of Type I or Type II. The brand of cement shall not be changed during the process of the work without written approval of the Architect. Sacked cement shall be so piled as to permit tally, inspection, and identification of each shipment.

E. Water: Water for washing aggregates and for mixing and watering concrete shall be free from oil, acids, alkali, organic or other deleterious matter. During extremely warm summer months, mixing water shall be the coolest available at the site.

F. Expansion Joint Filler shall be performed, asphalt saturated fiberboard containing not less than 25% nor more than 50% asphalt by weight (ASTM D1751).

G. Curing Compound shall be an approved, clear, resin base compound. Compound for use on architectural concrete surface shall be field demonstrated to be non-staining and oil and wax free before it will be approved. Compound for use on roof deck surface shall be of a type that will not affect the bond of the roofing or membrane to be used. Curing compounds shall not be used on interior slab-on-grade floors to receive low permeable flooring.

H. Admixtures shall be Pozzolith, of the types specified herein or, at the option of the Contractor, as may be indicated by job conditions. Admixtures shall be used only after approval by the Architect.

I. Bond Breaking Compounds must be approved by the Architect, and shall be suitable for the casting and erection techniques used.

J. Color Pigment shall be Davis Colors as manufactured by Frank D. Davis Co., and shall be selected from the manufacturer's standards colors. (213) 269-7311.

K. Form Lining for pre-cast concrete shall be Burke Form Coating.

L. Form Coating for cast-in-place architectural concrete shall be Nox-Crete Form Coating.

M. Waterstop: Waterstop - RY; flexible material with sodium bentomite; continuous maximum lengths; recessed from joint; a minimum of 2" concrete cover; as manufactured by Volclay, American Colloid Company or approved equal.

N. Metal Formed Construction Joints: Burke Kold Keyed Joint or approved equal for use in light traffic areas, office areas.

O. Reinforcing fibers: Shall be polypropylene, collated, fibrillated fibers from Fibermesh Co., or approved equal. Follow NER 284 and manufacturers requirements for installation. Only fibers designed and manufactured specifically for use in concrete and so certified shall be acceptable. (615) 892-7243.

2.03 FORM MATERIALS

A All forms, unless otherwise indicated on the Drawings, or specified herein, shall be of wood. Before erection, the inside surface of all wood forms shall be coated with non-staining material to seal against moisture loss. Forms for architectural concrete and forms at construction joists shall also be coated with "Nox-Crete".

1. Board Form for concrete shall be 1" x 6" T & G or shipped Douglas Fir, free from loose knots, holes and irregularities. Surface irregularities of T & G or shiplap must not exceed 1/8 inch.

2. Plywood Forms shall be of five ply Douglas Fir Plywood form grade, not less than 5/8 inch thick.

3. Curb and Slab Edge Forms may be of steel or wood.

B Form Ties. Form ties shall be of a type that can be removed, having no part of the tie permanently embedded less than 1-1/2 inches from any concrete surface. Ties passing through exposed surfaces shall be of the removable type that are removable without spalling concrete surfaces.

2.04 VAPOR BARRIER

All interior slabs shall be placed over 2" of sand over a Vapor Barrier.

1. Vapor Barrier shall be at least 3-mil "Vaporshield", a high density cross laminated poly or equal.

2. Vapor Barrier membrane shall be in as large sheets as possible with joints lapped 4-inches minimum and taped to form a watertight seal. All holes and penetrations by plumbing, conduit, etc., shall be sealed with tape and made watertight.

2.05 SOIL POISONING

A. Soil shall be treated against subterranean termites by a reliable and established, licensed termite control firm thoroughly familiar with local soils and chemicals.

B. Contractor shall notify Architect 24 hours before application of chemicals.

C. Apply an aqueous solution of 2% chlordane or 0.3% Dieldrin or 0.5% Aldrin as follows:

1. Under all floor slabs within the foundation walls -- 1 gallon per 10 square feet.

2. Along inside of foundation walls -- 2 gallons per 5 lineal feet.

3. Along outside of foundation walls -- 1 gallon per 5 lineal feet.

D. Chemicals under slabs shall be applied after fill is tamped and rough plumbing installed. Chemicals shall be applied not more than 24 hours before pouring concrete.

E. Guarantee: Treatment shall remain effective for not less than 5 years. The Contractor shall furnish a written 5 year guarantee in 3 copies stating if at any time during the 5 year period ground nesting termites occur, treatment will be applied to exterminate all infestation without cost to the Owner.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 BATCHING AND MIXING

A. Concrete, except as hereinafter, specified shall be mixed by a mechanical batch-type mixing plant. Plants shall be provided with adequate facilities for accurate measurement and control of each of the materials entering the mixer. All aggregate shall be measured by weight and stationary mixers shall be equipped with automatic apparatus for timing and for metering or measuring water. The apparatus shall have locks that will prevent unauthorized persons from changing the adjustment thereof. Fibermesh for slabs on grade shall be mixed into the concrete at the batch plant.

B. Any concrete that has not been placed within 90 minutes after water is first added to the batch shall be rejected.

C. Care shall be taken to avoid contamination of architectural concrete. All equipment must be thoroughly cleaned before use and each mixer shall be thoroughly washed out prior to charging with the first batch of each type of concrete to be used in exposed finished surfaces.

D. Approximately two thirds of the mixing water shall be added to the mixer when charging with lightweight aggregate. The aggregate and water shall then be mixed for not less than three minutes before cement and the balance of the water is added.

3.03 TRANSMIT MIX CONCRETE

Transmit mixed concrete shall be mixed for a period of not less than 10 minutes at a peripheral drum speed of approximately 200 feet per minute, and mixing shall be continued until discharge is completed. At least three minutes of the mixing period shall be at the job. Transit mixers shall be equipped with water measuring devices consisting of either accurately calibrated water tanks or water meters.

3.04 FORMS

A. General Construction. Forms, complete with all necessary cores and molds, shall be constructed to conform to shape, line, and dimensions as indicated on the Drawings, and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly supported, braced and tied so as to maintain their position and shape when filled with wet concrete, and shall be removable without damage to the concrete.

B. The limiting tolerance for thickness, misalignment, curvature, plumb and level shall be 1/4 inch plus or minus, for the surfaces shown on the Drawings; except that for concrete having a thickness of 4 inches or less, the thickness tolerance shall be plus 1/4 inch to minus 1/8 inch; for concrete in foundation walls below grade, the tolerance shall be plus 1/2 inch to minus 1/4 inch; and for footing pads the tolerance shall be plus 1 inch to minus 1/2 inch. Forms shall not be constructed more than 1 foot above any construction joint on the side of the wall from which concrete will be poured.

C. Vertical surfaces of foundations may be formed against earth where, in the opinion of the Architect, such surfaces are suitable. Excavations for unformed concrete shall be provided with a surround consisting of 2 x 8 inch boards laid flat along the edges of the excavation and secured in place prior to placing concrete.

D. Temporary openings shall be provided at a sufficient number of points in the form work to permit proper cleaning and inspection. No wood of any kind, either temporary or permanent, shall be used or installed inside of the forms unless otherwise indicated on the plans or as directed.

E. Embedded Materials. Ample opportunity and full cooperation shall be given to the various trades to install their required embedded items. All embedded materials shall be securely fastened in place before placing of concrete is started. Bolts and anchors shall be attached to forms or adequate temporary supports to effectively prevent movement during placement concrete.

F. Specific Requirements:

1. Forms for Vertical Wall Closures. Forms for outside (exposed) surfaces shall be of new 5/8" plywood, free from surface irregularities. Vertical edges shall be carefully scribed to pre-cast panel edges, and joints shall be carefully caulked and finished to prevent leakage and provide a smooth form surface. Plywood shall be secured to back-up members at horizontal splices and joints shall be filled and sanded smooth. A full length vertical 2 x 8 shall be secured against and support each edge of this (exposed outside face) form. Ties shall have removable spreader cones and be used in pairs at about 6 foot centers. Tie

holes in forms for exposed faces shall be drilled 1/32" small and ties shall be inserted from the inside face to avoid splintering the contact surface. All mortar leakage in and around exposed surfaces must be prevented. Window for concrete placement shall be provided on inside (concealed) surfaces, with adequate provision for closure and for securing against displacement. Additional form ties at windows will not be permitted.

2. Forms for Bottom Wall Closures. Forms for outside (exposed faces) shall be of 2 inch lumber, plywood lined. Joints in lining shall be staggered with joints in back-up material and shall be filled and sanded smooth. Forms shall be supported in such a manner as to insure against movement and to provide a concrete surface in a plane with vertical closures. The top edge of the outside form shall be notched at 12 inches to permit the escape of air. Notches may be round, square or triangular and shall be approximately 1/2 inch deep.

3.05 PREPARATION FOR PLACING

Forms, soil bottoms, reinforcement and all embedded items shall be approved by the Inspector before concrete is deposited. Water and all foreign matter shall be removed from forms, excavations, and mixing and conveying equipment. Any flow of water shall be diverted with proper side drains, and shall be removed by methods which will avoid washing over freshly deposited concrete. Screeds shall be provided at all walls and not over eight feet apart in the field of slabs. All slabs shall receive a monolithic finish, unless otherwise shown on the Plans or specified herein. Alternate areas between construction joints shall be placed during any one pour. All materials, except transit-mix concrete, necessary to the placing and curing of any concrete pour shall be on the job site prior to the start of the pour.

3.06 HANDLING CONCRETE

A. Conveying. Concrete shall be conveyed from mixer to forms as rapidly as practicable by a method which will prevent segregation or loss of ingredients. Belt conveyors, bucket chains, chutes or other similar equipment will not be permitted unless approved in writing by the Architect. Concrete for vertical wall closures shall be pumped into place, using equipment that will handle the specified mix without excessive water.

B. Placing. Concrete placing shall be carried on as a continuous operation until the given unit of operation, approved by the Architect, is completed. Concrete shall be deposited as nearly as practicable in its final position to avoid flowing or rehandling. Drops of more than six feet (6') will not be permitted. It shall not be placed in such a manner as to leave accumulations of mortar on the form surfaces or reinforcement above the placed concrete. Where necessary, vertical ducts of canvas, rubber or metal shall be used in the forms. Concrete shall be uniformly distributed during the process of depositing, and in no case after deposition shall any portion be displaced in the forms more than six feet in a horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 18". Each layer shall be placed while the previous layer is still soft. Concrete that has attained its initial set shall not be deposited in the work. No concrete shall be re-tempered nor shall any concrete be used that has stood for more than 30 minutes after the mixer has stopped or after discharge from the mixer. Concrete shall be placed in closures at bottom of wall panels in such a manner as to avoid trapping air against the outside form face.

C. Cold Weather Placement. Concrete shall be mixed and placed only when the temperature is at least 50 degrees F., and rising.

D. Hot Weather Placement. Concrete shall not be placed when the atmospheric temperature is above 100 degrees F and special care shall be taken for placement in temperatures over 80 degrees.

1. All materials and equipment shall be stored in the shade.

2. Shade shall be provided for all slabs to be placed or finished after 10:00 a.m.

3. Special care shall be taken to obtain the coolest mixing water available.

4. Forms to receive concrete shall be kept cool by sprinkling until the pour has started.

When atmospheric temperatures exceed 80 degrees F., and/or wind velocities exceed 5 mph, the water content of concrete shall be adjusted and a retarding agent added as directed by the Architect.

E. Compaction. Concrete shall be thoroughly compacted during placement, and shall be carefully worked around reinforcement and embedded items along surfaces and into corners of forms. Except where compaction by hand-tamping is specified, it shall be placed in layers not over 18" in depth and each layer shall be compacted with internal vibration equipment supplemented by hand-spading, rodding and tamping. Vibrators shall not be used to transport concrete inside forms. There shall be at least one vibrator per ten yards of concrete placed per hour, with one spare vibrator maintained on the job. Vibrators shall not be inserted into lower courses that have begun to set, nor into solid or sand bottoms. Where hand-tamping is used, there shall be not less than one man for each five cubic yards of concrete placed per hours, whose time shall be used in tamping ONLY.

F. Modified Mix. Where conditions make puddling difficult, or where the reinforcing is congested, batches may be modified with Architect's review of revised mix design.

G. Record of Placing. The Contractor shall coordinate keeping of a record with the Construction Manager at the job of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure and shall be open to the inspection of the Architect.

H. Wall Closures. Placement of concrete in vertical wall closures shall be carried out in 18-inch lifts, with concrete being pumped through form windows in the back of the form. The number of closures poured during one operation shall be limited and the rate of pour regulated so that successive lifts are placed while the lift below is still liquid, while avoiding excessive depth of liquid material in the forms. Placing of concrete shall not be started until the Contractor can be sure, beyond a reasonable doubt, of the continuous arrival of material at the pump hopper. Concrete shall be compacted by rodding along the face of the form with a piece of reinforcing steel. The length of the rod for the first pour shall equal the height of the wall. The rod shall be shortened after each lift so that it will penetrate 6 inches into the lift below. Each lift shall be worked sufficiently to insure a solid mass, but care shall be used to avoid causing segregation of coarse aggregate.

3.07 CONSTRUCTION JOINTS

A Location and detail of all construction joints not shown on the Plans shall be approved by the Architect in advance of placing operations and shall conform to ACI's recommendations.

B Existing surfaces shall be thoroughly roughened and cleaned of all laitance, foreign matter, loose particles and dust before placing new concrete. Forms shall be re-tightened, and the existing surfaces in structural concrete treated as follows, immediately ahead of concrete placement:

1. Vertical construction joints shall be washed with clean water and then slushed with a grout coat of neat cement. Form windows shall be provided as necessary for this operation.

2. Horizontal construction joints shall be washed with clean water and, when so directed by the Architect, shall then be covered with a layer, not less than 2 inches nor more than 6 inches in thickness, of a modified mix as specified herein before. Form windows shall be provided as necessary to insure covering all joint surfaces.

C Place formed construction joints in pattern placement sequence. Set top screed to required elevations. Secure to resist movement of wet concrete.

D Horizontal concrete slab surfaces supporting concrete or masonry walls shall be wire brushed before hardening. Care shall be taken to avoid damage to adjoining concrete surfaces.

E Install joint fillers in accordance with manufacturer's instructions. Use primers of type recommended by joint filler manufacturer.

3.08 PIPES AND CONDUITS

A. Pipes other than conduit for electrical circuits shall not be embedded in structural concrete.

B. Conduit Location. When placed in structural slabs, conduit shall be located within the middle half of the slab and should not be placed between reinforcing steel and the bottom of the slab. Conduit in slabs on grade shall be placed below reinforcement steel and shall be supported on concrete blocks to insure complete concrete encasement. Blocks for supporting conduit shall be as specified for the support of reinforcement bars in the section "Reinforcing Steel". When located in columns, walls or beams, conduit shall be located so that, in the opinion of the Architect, the strength of the structure is not impaired.

C. Conduit Size. No conduit placed in a concrete slab shall have an outside diameter greater than one-third the thickness of the slab. No conduit larger than 1 inch shall be embedded in floor slabs. Larger conduit shall be below bottom surface of slabs and encased separately.

D. Sleeves. Appropriate sleeves shall be provided for all pipe or conduit passing through any walls or floors. Sleeves shall be so located so as not to impair the strength of the structure. Openings larger than 12 inches in dimension will not be permitted unless specifically shown on the Drawings.

3.09 REMOVAL OF FORMS

The removal of forms shall be carried out in such a manner as to insure the complete safety of the structure and to avoid damage to concrete surfaces. In no case shall supporting forms or shoring be removed until concrete has hardened sufficiently to permit their removal with safety. Soffit forms and supports for beams, lintels and slabs above grade shall remain in place until laboratory tests show that they can be removed safely. Forms for surfaces to be sandblasted, except beam soffits, may be removed after three days, if removal can be accomplished without damage to concrete surfaces.

3.010 SLABS ON EARTH

A. Placing. Concrete shall be placed in one continuous operation between construction joints after soil poisoning, vapor barrier and sand protection have been laid. Spreading by hand shall be with shovels; rakes shall not be used. Workmen shall be required to remove all dirt or mud from their footwear before stepping into freshly mixed concrete. Concrete shall be thoroughly compacted by hand tamping in such a manner as to force the larger aggregate into the body of the slab and bring to the top a minimum of free mortar. Surfaces shall be carefully screeded off after compacting, using approved screeds accurately set to the finished grade of the slab, and shall be worked to a true and even grade free from waves and irregularities.

B. Finishing. All slabs shall receive a monolithic finish unless otherwise specified. All slab marking and jointing shall be as detailed and at locations indicated on the Drawings. Perimeters of all slab areas and edges of all walks shall be finished with an edger unless otherwise indicated. Edging tools shall have a radius of 1/8 inch for joints and 1/4 inch for discontinuous edges unless otherwise shown. Corners or edges of slabs which have crumbled and any area which lacks sufficient mortar for proper finishing shall be

corrected by removing all loose aggregate and/or soupy mortar and filling with a suitable concrete mixture. Unnecessary tool marks shall be limited and all edges and joints shall be smooth and true to line. Where tooled joints (T.J.) are indicated on the Drawings, such joints shall be formed using a marking tool with a knife extension. The total depth of depression thus formed shall be not less than 1/2 inch nor greater than 3/4 inch. Such additional scoring as may be required by the Architect shall be with a standard marking tool (without extension) and will be at approximately 4 feet each way. At the Contractor's option, saw-cut joints may be submitted for the weakened plane joints shown, except in exposed aggregate surfaces. Saw cuts must be uniform, straight, to the depth indicated for W .P. joints, and shall be made as soon as they can be made without spalling the concrete surface. Any spillage or splatter of concrete mortar on adjacent slabs or structures shall be removed immediately by flushing with water.

C. Sealing -- Joint sealing is described in the section "Caulking".

3.011 CONCRETE FINISHES

A. All exposed concrete surfaces, exterior and interior, shall be uniformly finished and shall have a surface texture as hereinafter described. Surfaces shall be free from rough spots, stains, hardened mortar or grout, and other imperfections. Cleaning and repairing of concrete surfaces shall be as directed by the Architect.

B. Steel trowel finish shall be used for finish building floor slabs, for top surfaces of pre-cast elements and for all concrete bases and curbs except where otherwise indicated on the Drawings or specified herein.

C. Steel troweling of floated surfaces may begin as soon as the surface has hardened enough to prevent excess fine material from working to the surface. The finished surface shall be hard and smooth and care shall be taken to minimize trowel marks and trowel "burn". Dusting will not be permitted except as hereinafter specified. Except where warped surfaces are indicated, slabs shall be finished to a true plane surface, free from humps or sags. The finished surface shall not deviate more than 1/8 inch from the edge of a 10-foot steel straightedge. Areas not conforming to the intent of these Specifications shall be corrected by grinding or measures satisfactory to the Architect.

D. Broom finish shall be used for concrete walks and exterior slabs where so directed by the Architect. Surfaces to receive broom finish shall first be finished as specified above for steel trowel finish. Immediately after troweling, these surfaces shall be broomed uniformly as directed by the Architect, using a broom with moderately coarse, stiff bristles.

E. Formed surfaces (finished). All exposed or painted formed surfaces, except where a steel trowel finish is required, shall be smooth and uniform. All form tie holes shall be filled, all honeycomb and other imperfections repaired and all fins removed. Rough spots, stains and hardened mortar shall be removed from all surfaces by rubbing lightly with fine carborundum stone. Water shall be used liberally and rubbing shall be sufficient only to remove defects without changing the surface texture.

F. Formed surfaces (rough). Repair all honeycomb and fill all form tie and bolt holes in concealed concrete surfaces.

G. Slab surfaces to receive mud-set tile shall be marked with a grid tamper to provide a suitable surface for bonding.

H. Salt Finish: Surfaces shall be floated finish prior to application of salt. Coarse salt shall be applied to the required slab. Amount and duration shall be determined by sample. Salt shall then be washed clean from all concrete surfaces. Adjacent broom surfaces to be protected.

I. Samples. Prior to placing concrete in areas to receive exposed aggregate or sandblasted finishes, the Contractor shall prepare a 30" x 30" sample panel of each of

these types of finishes, using the specified materials. Sample panels must be approved by the Architect, and shall match existing columns as closely as possible. The panels prepared by the Contractor shall then be used as standards for the finishes represented and shall be the basis for acceptance or rejection of these finishes.

3.012 PATCHING

Honeycomb, or minor defects, and hole remaining from form ties, bolts or test cores shall be patched. Mixes for use in patches in architectural concrete finishes shall consist of cement mortar and suitable aggregates that will produce patches to match the patched surface. Mortar for concealed patches shall consist of one part Portland cement and three parts fine aggregate. Exposed patch surfaces shall be finished to match the adjoining surface. Holes passing entirely through the wall shall be filled from the inside face with a device that will force the mortar through to the outside face, using a stop held at the outside wall surface to insure complete filling. Holes which do not pass entirely through the wall shall be packed thoroughly full. Concrete surfaces to be patched shall be thoroughly moist, but free of surface water at the time of patching. Patches shall be cured as specified for concrete. Only 100% portland cement materials shall be used for the patching of slabs to receive flooring.

3.013 DEFECTIVE CONCRETE

If any concrete does not fully conform to the provision of these specifications, such work shall be deemed to be defective materials and/or workmanship, and the Contractor shall remove same from the site, at no extra cost to the Owner. When and as direct by the Architect, defective concrete may be cut out and repaired, at no extra cost to the Owner.

3.014 CURING

A. All concrete surfaces shall be effectively sealed against moisture loss or shall be kept continuously wet for a period of not less than ten (10) days. Forms containing concrete and earth fill against concrete shall be kept continuously moist by sprinkling during this period. Prior to the commencement of each concrete pour, all materials and equipment, including hoses, nozzles, etc., necessary to the curing of that concrete pour, shall be at the job site. Curing operations shall commence immediately after concrete has been placed and shall be continuous for the duration of the curing period.

B. Floor slabs and textured exterior slabs shall be cured by wet-cure method covering with an approved burlap or membrane kept moist by periodic spraying. Edges of the membrane covering shall be lapped not less than 6 inches and shall be weighted with wind-rows of clean sand. At no time shall the membrane be allowed to dry out during the first 10 days after pouring the slab. Units shall be removed from forms as soon as possible and shall be immediately coated on the under surface and edges. Walks, curbs and smooth exterior slabs may be cured as specified for floor slabs or coated with a suitable manufacturer's instructions, and all thin spots or breaks that occur during the curing period shall be repaired by the application of additional material. Special care shall be taken to avoid coating reinforcing steel, construction joint and expansion joint surfaces with curing compound. Exposed surfaces of construction joints and expansion joints shall be cured by sealing under a building paper or by a wet blanket covering. If weather conditions are severe, and when directed by the Architect, surfaces shall be kept moist with a fine fog spray until protected as specified above.

C. Curing water, if any shall be led away from buildings and structures, and shall not be permitted to pond within 10 feet of any construction.

3.015 PROTECTION

A. All finished concrete shall be protected during the course of construction, and any chips, cracks, or other defects that occur during the course of construction to any concrete shall be repaired as may be directed by the Architect.

B. Surfaces of architectural concrete shall be covered to protect them from spatter during placement of adjoining concrete. Strips of Vis-Queen shall be placed under the edges of exposed aggregate slabs adjacent to other concrete to be placed, and shall then be folded back over the finished surfaces to protect them.

3.016 CLEAN UP

Clean up all exposed concrete surfaces and all adjoining work which has been stained by leaking or spatter of concrete, to meet the approval of the Architect, immediately after each concrete pour.

*****END OF SECTION*****

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SECTION 03320

CONCRETE SEALERS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

A. Work included: Seal, harden or color concrete surfaces where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section included, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.

2. Section 03300: Cast-In-Place Concrete

3. Section 03345: Concrete Finishing

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use an applicator currently approved in writing by the manufacturer of the specified product.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Sufficient technical data to prove compliance with the specified requirements.

2. Evidence satisfactory to the Architect that the proposed applicator is currently approved by the manufacturer of the specified product.

PART 2 -- PRODUCTS

2.01 SEALER

A. Wherever the Drawing indicates concrete with sealer, the surface shall be treated with ready-to-apply clear sealing compound. Where a sealer is used in conjunction with a hardener with color, use only a product recommended by the manufacturer of the hardener as accepted by the Architect.

B. Comply with ASTM C 309, Type I, Class B.

C. Acceptable products:

1. "Industrial Concrete Sealer" by Burke Company, San Mateo, California, (213) 724-6690.

2. "Sealtight Intex" by W.R. Meadows, Inc., Benica, California, (714) 759-5006.

3. "Lithothane Concrete Sealer" by L.M. Scofield Company, Los Angeles, California, (213) 723-5285.

2.02 HARDENER

A. Wherever the Drawings indicate concrete with hardener, the surface shall be treated with a non-metallic dust-on floor hardener.

B. Acceptable products:

1. "Non-metallic Floor Hardener" by Burke Company.

2. "Mastercron" by Master Builders, Inc., Anaheim, California, (714) 978-6961.

3. "Lithocrome" by L.M. Scofield.

2.03 HARDENER WITH COLORS

A. Wherever the Drawings indicate colored concrete floor hardener, the surface shall be treated with a non-metallic dust-on hardener in colors selected by the Architect.

B. Acceptable products:

1. "Lithocrome Color Hardener" by L.M. Scofield Company.

2. "Colorcron" by Master Builders, Inc.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which the work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 APPLICATION OF SEALER

A. Preparation:

1. On freshly finished concrete surfaces, no additional surface preparation is required.

2. On areas where forms are recently removed, remove all form oil and breaking compound residue to assure penetration of the product in to the pores of the material to be treated.

3. On existing concrete, vertical surfaces, and masonry surfaces:

a. Sweep all areas to be treated, using a fine bristle broom, or hose off with water and let dry to remove all surface dust and dirt.

b. Free the surface from all contaminants which would inhibit penetration of the product into the pores of the material to be treated.

c. Remove all curing, sealing, and coating agents by use of chemical or mechanical means as necessary.

d. If acid is used to remove surface coatings, flush the surface with water sufficiently to remove all acid and acid residue.

4. When applying near windows, mask the glass.

5. Avoid contact with plant life, glass, aluminum, and other finished surfaces. Where contact occurs, immediately wipe a damp cloth or flush with water.

6. Avoid contact with asphaltic concrete.

B. Application:

1. On freshly finished surfaces, spray the product with a low pressure sprayer immediately following the finishing operation.

   a. To assure proper curing, apply the product to the entire surface as soon as the surface is firm enough to walk on, and before checking and temperature cracking begins.

   b. Keep the entire surface wet for 30 minutes by brooming excess product on to the dry spots, or by re-spraying the dry spots immediately.

   c. As the product begins to dry into the surface and becomes slippery underfoot, lightly sprinkle the surface with water to aid penetration and to bring alkali to the surface.

   d. As the product again begins to dry into the surface and become slippery underfoot, flush the surface with water and squeegee the surface totally dry, removing all excess product and alkali or other impurities brought to the surface.

2. On broom-finished surfaces, no flushing is required, but squeegee or broom the excess product form surface after 30 to 40 minutes.

3. On cured concrete surfaces, saturate the surface with the specified product.

   a. If dry spots appear, broom excess material onto the dry spots or re-spray them immediately.

   b. Keep the entire surface wet with the product for 30 minutes.

   c. If, after 30 to 40 minutes, the majority of the product has not been absorbed into the surface, broom or squeegee the excess product from low spots and puddles so it will be absorbed into the surface, or remove such excess product from the surface.

   d. If, after 30 to 40 minutes, the majority of the product is still on the surface, wait until the surface becomes slippery underfoot and then flush the entire surface with clear water and squeegee completely dry. If no water is available, squeegee the excess product from the surface after 30 minutes so that the surface is completely dry.

3.03 APPLICATION OF HARDENER

Apply the hardener after the surface of the concrete has reached the stage where no excess moisture shows, but while still plastic.

1. Hardener shall be applied at the rate of 40 pounds per 100 square feet of surface for the initial application.

2. Hardener shall be evenly distributed and thoroughly floated into the surface mortar with a wood float. 20 pounds of additional hardener shall be applied over each uniform color and texture.

3. All hardener and/or colored concrete floors shall be cured and protected with concrete curing paper or plastic until just prior to final cleaning.

4. Before applying curing paper or plastic, interior floors treated with colored hardener shall be given a heavy protective coat of colored wax left unpolished, and then immediately covered with the paper. If wax is not applied within two (2)

hours after final troweling, the concrete shall be sprayed with a fine water mist and kept continuously moist until wax is applied, unless spraying is not recommended by the manufacturer of the hardener.

5. Cleaning and finishing: After all other work including plastering and painting has been completed, the curing paper shall be removed and waxed floors cleaned of protective wax coating. Clean all floors to remove dirt, stains or blemishes, and repair and restore damaged floors to their original condition. The hardener manufacturer's recommendations, directions, and recommended materials and methods shall be used for the protective wax coating, cleaning and finishing work.

*****END OF SECTION*****

SECTION 03345

CONCRETE FINISHING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Work included: Provide finishes on cast-in-place concrete as called for on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Except as may be modified herein or otherwise directed by the Architect, comply with ACI 301, "Specifications for Structural Concrete for Buildings".

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 PRODUCT HANDLING

Comply with pertinent provisions of Division 1.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. General:

1. Carefully study the Drawings and these Specifications, and determine the location, extent, and type of required concrete finishes.
2. As required for the Work, provide the following materials, or equals accepted in advance by the Architect.

B. Liquid bonding agent: "Weld-Crete," manufactured by the Larsen Products Corporation.

C. Curing and protection paper:

1. Comply with ASTM C171, Type 1, regular.

2. Accepted products:

a) "Sisalkraft, Seekure 896";

b) Equal non-staining products faced with polyethylene film.

D. Slip-resistant abrasive aggregate:

1. Provide aluminum oxide grains, uniformly graded, screen size 12-13, 14-36 or 16-30.

2. Acceptable product:

a) Emerchrome Floor Hardener by L.M. Scofield Company.

b) Frictex H by Sonneborn.

c) or approved equal.

2.02 OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FINISHING OF FORMED SURFACES

A. General:

1. After removal of forms, give exposed concrete surfaces the finish specified below.

2. Revise the finish as needed to secure the acceptance of the Architect.

B. Rubbed finish:

1. Do not start cleaning operations until all contiguous surfaces to be cleaned are completed and accessible.

2. Do not permit cleaning as the work progresses.

3. Mix one part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint.

4. Substitute white portland cement for part of the gray portland cement as required to produce a color matching the color of surrounding concrete, as determined by a trial patch.

5. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout, and apply the grout uniformly with brushes or spray gun.

6. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.

7. While the grout is still plastic, remove all excess grout by working the surfaces with a rubber float, sack, or other means.

8. After the surface whites from drying (above 30 minutes at normal temperatures), rub vigorously with clean burlap.

9. Keep the surface damp for at least 36 hours after final rubbing.

3.03 FINISHING SLABS

A. Definition of finishing tolerances:

1. "Class A": True plane within 1/8" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.

2. "Class B": True plane within 1/4" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.

B. Scratched finish: For surfaces scheduled to receive bond-applied cementitious applications.

1. After the concrete has been placed, consolidated, struck off, and leveled to a Class B tolerance, roughen the surface with stiff brushes or rakes before the final set.

C. Floated finish: For surfaces intended to receive roofing.

1. After the concrete has been placed, consolidated, struck off, and leveled, do not work the concrete further until ready for floating.

2. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.

3. During or after the first floating, check the planeness of the surface with a ten foot straightedge applied at not less than two different angles.

4. Cut down high spots and fill low spots, and produce a surface with a Class B tolerance throughout.

5. Refloat the slab immediately to a uniform sandy texture.

D. Troweled finish:

1 Provide a floated finish as described above, followed by a power troweling and then a hand troweling which is relatively free from defects, but which still may show some trowel marks.

a. Monolithic Trowel Finish: For all floor surfaces not otherwise specified. Steel trowel and retrowel to smooth surface. After concrete has set enough to ring true, retrowel to a burnished impervious finish, free of trowel marks or other blemishes.

b. Steel Float Finish: for all slabs to receive resilient tile, waterproof membrane, or carpeting. Same as monolithic finish except omit burnish retroweling.

c. Fine Swirl Finish (when shown on the Drawings): Prepare same as steel float finish. When ready, perform such finishing operations as necessary to produce Architect-selected fine textured, non-slip finish. Construct sample panel for Architect's acceptance prior to placement. Sample panel shall consist of tooled edges and have a tooled joint within field of panel.

2 Provide a finished surface essentially free from trowel marks, uniform in texture and appearance, and in a plane of Class A tolerance.

E. Broom finish: For slabs to receive thin set tiles, apply steel float finish followed by very fine broom finish. For surfaces to receive mortar setting beds and for exterior concrete driveway ramps, curbs and gutters, spandrels, etc.

1. Provide a finished surface uniform in texture and appearance, and in a plane of Class A tolerance. Roughen surface with coarse broom.

F. Rock Salt finish: Exterior walkways and pavings except where non-slip finish is specified.

1. Provide a floated finish as described above.

2. While the surface is still plastic, broadcast rock salt into the surface and embed uniformly into the surface by light tamping.

3. Float the surface until it has been brought to a true plane with Class B tolerance.

4. After the concrete has completely set, flood the surface with water to dissolve the rock salt, using a fine bristle brush as necessary to remove the salt.

5. Provide a sample panel at the site of the proposed finish and receive the acceptance of the Architect of that finish prior to placing of the paving.

G. Non-slip finish: For exterior platforms, steps, and landings; and Interior and exterior pedestrian ramps.

1. Provide a floated finish as described above.

2. While the surface is still plastic, broadcast abrasive aggregate as specified in Paragraph 2.01.F above and work into the surface according to the manufacturer's recommendations.

3. Complete finishing surface as described above for a troweled finish, and as recommended by the aggregate manufacturer.

3.04 CURING AND PROTECTION

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.

B. Preservation of moisture:

1. Unless otherwise directed by the Architect, apply one of the following procedures to concrete not in contact with forms, immediately after completion of placement and finishing.

a. Ponding or continuous sprinkling;

b. Application of absorptive mats or fabric kept continuously wet;

c. Application of sand kept continuously wet;

d. Continuous application of team (not exceeding 150° F) or mist spray;

e. Application of waterproof sheet materials specified in Part 2 of this Section;

f. Application of other moisture-retaining covering as accepted by the Architect.

g. Where forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.

2. Cure concrete by preserving moisture as specified above for at least ten days.

C. Temperature, wind, and humidity:

1. Cold weather:

a) When the mean daily temperature outdoors is less than 40° F, maintain the temperature of the concrete between 50° F and 70° F for the required curing period.

b) When necessary, provide proper and adequate heating system capable of maintaining the required heat without injury due to concentration of heat.

c) Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

2. Hot weather: When necessary, provide wind breaks, fog spraying, shading, sprinkling, ponding, or wet covering with a light colored material, applying as quickly as concrete hardening and finishing operations will allow.

3. Rate of temperature change: Keep the temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and not exceeding a change of 5° F in any one hour period, or 50° F in any 24 hour period.

D. Protection from mechanical injury:

During the curing period, protect the concrete from damaging mechanical disturbances such as heavy shock, load stresses, and excessive vibration.

1. Protect finished concrete surfaces from damage from construction equipment, materials, and methods, by application of curing procedures, and by rain and running water.

2. Do not load self-supporting structures in such a way as to over stress the concrete.

*****END OF SECTION*****

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SECTION 04100

MORTAR AND GROUT

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Work included in this Section:

1. Mortar and grout for masonry.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

Submit product data and samples.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperatures to minimum 40° F prior to, during, and 48 hours after completion of masonry work.

B. Protect construction from direct exposure to wind and sun when erected in ambient air temperature of 99° F in the shade, with relative humidity less than 50%.

1.07 MIX TESTS

A. Testing of Mortar Mix: in accordance with ASTM C780. Test mortar mix for compressive strength. Refer to structural drawings for required strength.

B. Testing of Grout Mix: in accordance with ASTM C1019. Test grout mix for compressive strength. Refer to structural drawings for required strength.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type I or II (Type I for glass block).

B. Mortar Aggregate: ASTM C144, standard masonry type.

1. Provide clean, sharp, well-graded aggregate free from injurious amounts of dust, lumps, shale, alkali, surface coatings, and organic matter complying with UBC Standards.

2. Not less than 3% shall pass the No. 100 sieve.

C. Hydrated Lime: ASTM C207, Type S.

D. Grout "Course": 1 part Portland cement to 2-1/4 parts minimum to 3 parts maximum of damp loose sand to 1/10 part lime putty and 2 parts coarse of maximum 3/8 inch aggregate with sufficient water to achieve fluid consistency per ASTM C476. Not less

than 5% of the sand shall pass No. 100 sieve. Use in grout spaces 2 inches wide or more and in all filled cell construction.

E. Grout "Fine": 2-1/4 to 3 parts maximum damp, loose sand to 1/2 to 1/4 part lime putty with 1 part Portland cement and sufficient water to achieve fluid consistent per ASTM C476. Not less than 5% of the sand shall pass No. 100 sieve. To be used where shown on Drawings and where grout space is less than 2" in least dimension.

F. Water: Clean, potable and free from deleterious amounts of acids, alkalis and organic materials.

G. Lime Putty: Shall be made from pulverized (processed) quick lime or from hydrated lime.

2.02 COLOR

Mortar and Grout Color: Provide pre-ground mineral oxides, non-fading and alkali proof as manufactured by L.M. Scofield or approved equal. The Architect shall select color.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270 - Type S.

B. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar. Do not use any admixtures unless specifically accepted in advance by the Architect through the submittal process.

D. Use mortar within two hours after mixing at temperatures of 80° F, or two-and-one-half hours at temperatures under 50° F.

E. Mechanically mix in a batch mixer for not less than three minutes, using only sufficient water to produce a mortar that is spreadable and of a workable consistency.

F. Re-temper mortar with water as required to maintain high plasticity. Do not re-temper mortar after 1-1/2 hours following initial mixing.

2.04 GROUT MIXING

A. Mix concrete in accordance with ASTM C94.

B. Add admixtures in accordance with manufacturer's instructions when previously approved. Provide uniformity of mix.

a. Waterproofing admixture shall be A.C. Horn's "Hydratite" or approved equal.

b. To reduce early water loss and produce expansive action admixture shall be Sika Grout Aid.

C. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

E. Request inspection of spaces to be grouted. Do not proceed until all sub-surfaces and spaces are acceptable.

3.02 INSTALLATION

A. Install mortar and grout to requirements of the specific masonry Sections.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Do not displace reinforcement while placing grout.

D. Remove grout spaces of excess mortar.

*****END OF SECTION*****

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SECTION 04200

REINFORCED UNIT MASONRY SYSTEM

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

The work under this section includes furnishing all labor, materials and equipment, and performing all operations in connection with all masonry work, concrete block and glass block, indicated on the Drawings, specified herein, or reasonably required to complete all masonry work. Coordinate with other trades and install all embeds and inserts required.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

A. Submit shop drawings indicating bar sizes, spaces, locations, quantities of reinforcement, bending and cutting schedules and spacing devices.

B. Submit product data on masonry units.

1.05 QUALITY CONTROL

A. Company specializing in performance of work of this Section for a minimum of 5 years. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Design engineered masonry work under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of California.

1.06 DELIVERY AND STORAGE

All materials shall be delivered, stored and handled so as to prevent the inclusion of foreign materials and/or damage. Packaged materials shall be delivered and stored in original packages until ready for use. Packages or materials showing evidence of damage shall be rejected.

PART 2 -- PRODUCTS

2.01 MASONRY UNITS

A. Concrete Block shall be hollow concrete masonry units conforming to the requirements for Grade N units, Type I under ASTM Specification C-90.

B. Masonry Units shall be 8"x8"x16" nominal as manufactured by Orco Block Co. or approved equal (909) 849-7891.

1. Block types, sizes, and patterns as indicated on the drawings.

2.02 MORTAR AND GROUT

A. Mortar shall be as specified in Section 04100 and shall develop a compressive strength of not less than 750 lbs. per square inch at seven (7) days or less than 1800 pounds per square inch at twenty-eight (28) days or as specified on the Structural Drawings. The total clay content, including that in the sand, shall not exceed 2 percent of the sand content or 6 percent of the cement content.

B. Grout fill for cells shall consist coarse grade as specified in Section 04100. Minimum grout strength to be 2000 pounds per square inch (psi) unless otherwise specified on the Structural Drawings.

2.03 REINFORCEMENT AND ANCHORAGE

A. Single wythe joint reinforcement for CMU: Truss type; hot dip galvanized after fabrication cold-drawn steel conforming to ANSI/ASTM A82.

B. Reinforcing Steel for CMU: Deformed bar billet type, specified in Section 03200; size as shown on Drawings, unprotected finish.

C. Strap anchors for CMU: Bent Steel shapes as shown on Drawings or required for complete and proper installation of this Work.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Verify items provided by other Sections of work are properly sized and located.

E. Verify that built-in items are in proper location, and ready for roughing into masonry work.

F. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. Preparation. Concrete surface to receive masonry shall be free from all dirt, oil, curling compound, or other deleterious substance. All such surfaces shall be thoroughly washed with water before laying block and shall be in a condition to provide maximum suction at the time the mortar bed is placed.

D. Verify that Channel and Anchor placement for Glass Block is at all head and jambs.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in running bond. One Course is one unit and one mortar joint and is equal to 8 inches. Form flush mortar joints. Do not use chipped or broken units.

3.04 ENVIRONMENTAL CONDITIONS

A. Do not place masonry units when air temperature is below 40 degrees F.

B. Protect masonry from direct exposure to wind and sun. When erected in ambient air temperature of 99 degrees F in the shade, with relative humidity less than 50%.

3.05 PLACING AND BONDING – CMU

A. General:

1. Do not commence installation of the work of this Section until horizontal and vertical alignment of foundation is within 1/2" of plumb and the lines shown on the Drawings.

2. Use masonry saws to cut and fit masonry units.

3. Set units plumb, true to line, and with level courses accurately spaced.

4. Clean the top surface of foundation free from dirt, debris, and laitance, and expose the aggregate prior to start of installing first course of sandblasting or water blasting.

5. Accurately fit the units to plumbing, ducts, openings, and other interfaces, neatly patching all holes.

6. Keep the walls continuously clean, preventing grout and mortar stains. If grout does run over, clean immediately.

7. All bolts embedded in masonry shall be grouted in place with not less than one inch of grout between the bolt and a masonry unit and shall be accurately set with templates.

B. Do not use chipped or broken units. If such units are discovered in the finished wall, the Architect may require their immediate removal and replacement with new units at no additional cost to the Owner.

C. Laying up: Pattern shall be running bond.

1. Place units in mortar with full shoved bed and head joints.

2. Align vertical cells of hollow units to maintain a clear and unobstructed system of flues.

3. Hold racking to an absolute minimum.

4. Provide running bond with vertical joints located at center of masonry units in the alternate course below.

5. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

6. Interlock intersections and external corners.

D. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.

E. Remove excess mortar as Work progresses.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where resilient base is scheduled. Joints shall be 3/8" thick. Split block joints shall be raked.

I. Isolate masonry partitions from vertical structural framing members with a control joint.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 REINFORCEMENT AND ANCHORAGES -- CONCRETE UNIT MASONRY

A. Install horizontal joint reinforcement 16 inches unless structural plans note otherwise.

B. Place joint reinforcement continuous in first joint below top of walls.

C. Lap joint reinforcement ends minimum 40 bar diameters. Install reinforcement in first horizontal course above openings. Extend minimum 24 inches each side of openings.

D. Support and secure reinforcing bars from displacement. Maintain position with 1/2 inch of dimensioned position. Provide metal accessories to ensure adequate alignment of steel during grout filling operations.

E. Embed anchors attached to structural steel members. Embed anchorages in every second block joint.

F. Reinforce joint corners and intersections with strap anchors 16 inches OC.

3.07 GROUTED COMPONENTS

A. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

B. Place and consolidate grout fill without displacing reinforcing. Solidly fill all cells and courses unless otherwise indicated on the Drawings. Maximum grout lift shall be 24 inches.

C. Consolidate grout at time of pour by puddling with mechanical vibrator to completely fit all voids and interstices in the masonry work.

3.08 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned clear of mortar and unobstructed.

B. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure seven (7) days before placing grout.

C. Reinforce masonry unit cores with reinforcement bars and grout as indicated.

D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with Section 03200. See Drawings for indication of locations where splicing is unacceptable.

E. Wet masonry unit surfaces in contact with grout just prior to grout placement.

F. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces equal to or greater than 2 inches in width with course grout using high or low lift grouting techniques.

G. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.

H. Low Lift Grouting: Place first lift of grout to a height of 16 inches and rod for grout consolidation. Place subsequent lifts in 8-inch increments and rod for grout consolidation.

3.09 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control joints.

B. Install performed control joint devices in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions. Control joints shall be 12'-0" O.C. maximum.

C. Size control joint in accordance with Section 07900 for sealant performance.

3.10 BUILT-IN WORK

A. As work progresses, build in metal doorframes, anchor bolts, plates, and other items furnished by other Sections.

B. Build in items plumb and level.

C. Bed anchors of metal doorframes in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

D. Do not build in organic materials subject to deterioration.

3.11 DEFECTIVE MASONRY OR MATERIALS

Any masonry materials delivered to the job site that do not conform to the requirements of these Specifications, shall be immediately removed from the work. Completed masonry that does not conform to the requirements of the Drawings and these Specifications shall be deemed defective materials and/or workmanship, and the Contractor shall remove it from the site, at no extra cost to the Owner.

3.12 CURING

All masonry work shall be kept continuously moist until and for not less than three (3) days after grouting. Curing water shall not be permitted to pond around buildings or structures.

3.13 TOLERANCES

A. Maximum Variation From Alignment of Columns: 1/4 inch.

B. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.

C. Maximum Variation From Plane of Wall: 1/4 in. in 10 feet and 1/2 in. in 20 feet or more.

D. Maximum Variation From Plumb: 1/4 inch per story non-cumulative.

E. Maximum Variation From Level Coursing: 1/8 inch in 3 feet, 1/4 inch in 10 feet, and 1/2 inch in 30 feet.

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.14 CUTTING AND FITTING

A. Cut and fit for pipes, conduits, sleeves, and grounds. Coordinate with other Sections of work to provide correct size, shape, and location.

B. Obtain Architect approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 CLEANING

A. Clean surfaces of masonry as required for proper application of the specified finishes.

B. Concrete Unit Masonry:

1. Use all means necessary to prevent staining of the exposed face by mortar, grout, and other material.

2. Remove mortar and grout stains as the work progresses.

3. Upon completion of the work of this Section, clean all exposed veneer surfaces with a 10% solution of muriatic acid in clear water, using fiber bristle brooms or brushes, followed by thorough rinsing with clear water.

4. In the event ordinary cleaning is not adequate, use a light sandblasting or other means as directed by the Architect, and at no additional cost to the Owner.

5. Replace defective mortar. Match adjacent work.

3.16 TEST & INSPECTIONS

A. Refer to structural drawings.

B. Mortar shall be tested as per U.B.C. Standards.

C. Grout shall be tested as per U.B.C. Standards.

3.17 PROTECTION OF FINISHED WORK

A. Protect finished installation.

B. Without damaging completed work, provide protective boards at exposed external corners, which may be damaged by construction activities.

*****END OF SECTION*****

SECTION 05120

STRUCTURAL STEEL

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

The work under this section includes furnishing all labor, materials and equipment, and performing all operations in connection with Structural and Miscellaneous Steel and related items indicated on the Drawings, specified herein or reasonably implied to complete the work.

1. Structural Steel framing members, support members, embed angles, and struts.
2. Base plates, anchor bolts and structural framing accessories for a complete and proper installation of the work.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedures." Conform to AWS Code D1.1-85. Welding Inspection:

1. It shall be the responsibility of the Contractor that the Architect be notified of the commencement of welding, shop or field, in ample time to provide inspection.
2. A representative of the Owner will inspect installation of Automatic end and welded studs. At the beginning of each day's work, a minimum of two test stud welds shall be made with the equipment to be used to metal, which is the same as the actual work piece. The test studs shall be subjected to a 90-degree bend test by striking them with a hammer. After the above test, the weld section shall not exhibit any tearing out or cracking.

C. The American Institute of Steel Construction (AISC) "Manual of Steel Construction" shall apply in the performance of this work, except for clauses contradicted by the General and special Conditions and this section of the Specifications.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Producers' or manufacturers specifications and installation recommendations for the following products, including laboratory test reports and other data required to prove compliance with the specified requirements.
   a. Structural steel, including certified copies of mill test reports covering chemical and physical properties;
   b. Unfinished bolts and nuts;
   c. Structural steel primer paint.

2. Shop Drawings including complete details and schedules for fabrication and shop assembly of members. Shop Drawings shall be generally in accordance with AISC "Structural Steel Detailing"

   a. Include details of cuts, connections, camber, holes, and other pertinent data;

   b. Indicate welds by AWS symbols, and show size, type, and length of weld;

   c. Provide setting drawings, templates, and directions for installing anchor bolts and other required anchors;

   d. Identify details by reference to sheet and detail number of the Drawings.

1.06 PRODUCT HANDLING

A. All material shall be handled, shipped, and stored in a manner that will prevent distortion or other damage. Material shall be stored off of the ground, in a clean location and kept properly drained. All damaged material shall be replaced or repaired as directed by the Architect.

B. Delivery and storage:

1. Delivery materials to the job site properly marked to identify the location for which they are intended.

2. Use markings corresponding to markings shown on the approved Shop Drawings.

3. Store in a manner to maintain identification and to prevent damage.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Rolled steel plates and bars: Comply with ASTM A36.

1. Girder and beam sections and beam cover plates.

2. All other bars, plates and shapes.

B. Steel Tube: Comply with ASTM A500, grade B. 46 ksi

C. Anchor bolts: Comply with ASTM A307, non-headed type with double hexagonal nuts unless otherwise indicated.

D. Unfinished threaded fasteners:

1. Comply with ASTM A307, grade A, regular low carbon steel bolts and nuts.

2. Provide either hexagonal or square heads and nuts, except use only hexagonal units for exposed connections.

3. High strength bolts: ASTM A-325

E. Primer: Use "10-99 Tnemec Primer," "Rustoleum No. 5769 Primer," or equal approved in advance by the Architect.

F. Anchor bolt templates: Provide separate steel templates not less than 10 gage for each anchor bolt group or assembly.

G. Electrodes for welding: Comply with AWS Code, using AWS A5.1 or A5.5 E70XX electrodes as required for intended use.

H. Welding rod for mild steel: ASTM A-233

I. Resistance welded studs shall be as manufactured by Nelson Stud Welding Division of Gregory Industries or by KSM Products, Inc.

2.02 FABRICATION

A. Shop fabrication and assembly:

1. Fabricate items of structural steel in accordance with AISC specifications: "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", latest edition, and as indicated on the approved Shop Drawings.

2. Properly mark and match-mark materials for field assembly and for identifications as to location for which intended.

3. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.

4. Where finishing is required, complete the assembly, including welding of units, before start of finishing operations.

5. Provide finish surfaces of members exposed in the final structure free from markings, burrs, and other defects.

B. Connections:

1. Provide bolts and washers of types and sizes required for completion of field erection.

2. Welded construction: Comply with AWS Code for procedures, appearance, and quality of welds, and methods used in correcting welded work.

3. Assemble and weld built-up sections by methods that will produce true alignment of axes without warp.

C. Experienced welding operators shall do welding. The operator, the welding equipment, the electrodes, the methods of making the welds, and all structural welds, as completed, shall be as approved by the representative of the approved Testing Laboratory.

D. Resistance welded studs shall be installed with special approved welding equipment, in accordance with stud manufacturer's recommendations.

E. Shop welds shall in general be made with the material to be welded positioned for down-hand welding. Root passes of all "U" or "V" joints for butt welds by manual process shall be made with #6010 rod; roots of butt welds shall be chipped or flame-gouged prior to deposition of seal weld or of initial pass of back-up weld.

F. Anchors. Welding rod for welded bar anchors shall be E 70 Series low hydrogen.

G. Exposed Welds. Welds that will be exposed to view, after building is completed, shall be neatly dressed off smooth, flush with the parent metal.

H. Holes for other work:

1. Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on the approved Shop Drawings.

2. Provide threaded nuts welded to framing, and other specialty items as shown, to receive other work.

3. Cut, drill, or punch holes perpendicular to metal surfaces.

4. Do not flame cut holes or enlarge holes by burning.

5. Drill holes in bearing plates.

2.03 SHOP PAINTING

A. General:

1. Shop paint structural steel work, except those members or portions of members to be embedded in concrete or mortar.

2. Paint embedded steel that is partially exposed on the exposed portions, and the initial 2" of embedded areas only.

3. Do not paint surfaces that are to be welded or high-strength bolted with friction type connections.

4. Apply two coats of paint to surfaces that are inaccessible after assembly or erection. Change color of the second coat to distinguish it from the first.

B. Surface preparation:

1. After inspection and before shipping, clean steel work to be painted.

2. Remove loose rust, loose mill scale, and spatter, slag, and flux deposits.

3. Clean steel in accordance with Steel Structures Painting Council SP-3k, "Power Tool Cleaning."

C. Painting:

1. Immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer's recommendations and at a rate to provide a uniform dry film thickness.

2. Use painting methods that will result in full coverage of joints, corners, edges, and exposed surfaces.

2.04 GALVANIZING

A. All steel and ferrous metal items located on the exterior of the building, or otherwise specifically shown or noted on drawings to be galvanized, shall be galvanized by the hot-dip process, conforming to ASTM A123-68a. All required hot-dip galvanizing shall be done after fabrication, in the largest sections possible. Items too large for available dip tanks shall be sprayed, by approved methods, with molten zinc to coating thickness of .003" to .004".

B. Weight of the zinc coating per square foot of actual surface shall average not less than 2.0 ounces and no individual specimen shall show less than 1.8 ounces. The thickness of the zinc coating shall be the normal coating to be obtained by immersion in a bath of molten zinc at a temperature of not more than 865 degrees F., and allowed to remain until the temperature of the work being galvanized becomes the same as the bath.

C. All shop galvanized metal work necessitating field soldering or welding which in any manner removes original galvanizing shall be restored by field cold galvanizing with "Galvaloy," "Galvicon," or "Drygalv."

D. After fabrication, work indicated on the Drawings to be galvanized shall be thoroughly cleaned in a pressure spray of hot alkali solution to remove all oil, grease and dirt, and then rinsed in hot water. Work shall then be hot-dip galvanized. Finish work shall be free from twist, bow, warp and excess spelter.

E. Spelter: The slab zinc (spelter) used shall conform to the standard specification for slab zinc of the American Society for Testing Materials.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. All work shall be executed and finished in accordance with approved shop drawings, and to conform to the best practice required to produce the highest-grade construction. Workmanship shall be equal to the best practice in modern structural shops. Portions of work exposed to view shall be finished neatly. Welds shall be neat and uniform.

B. Construction. Type I and Type II, in accordance with Section 1 of the AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".

C. Substitution of sections or modifications of details, or both, shall not be made without written approval of the Architect.

D. Furnish and deliver anchor bolts, inserts, plates and other incidental items of structural steel required to be built into concrete with instructions or templates for their installation, to respective trades at the proper time to avoid delay in work.

E. Report any errors in shop fabrication or deformation resulting from handling and transportation that prevent proper assembly and fitting of parts immediately to Architect and obtain approval of method of correction. Approved corrections shall be made at no additional cost to the Owner.

3.03 ERECTION

A. Comply with AISC specifications and "Code of Standard Practice," except as may be modified herein.

B. Anchor bolts:

1. Provide anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.

2. Provide templates and other devices necessary for pre-setting bolts and anchors to accurate locations.

C. Bases and bearing plates: Shop weld to columns and members attached to concrete.

D. Splicing:

1. Splice members only where indicated unless, with the Architect's approval, splices not indicated would result in lower costs due to reduced shipping expense.

2. For splices not indicated, submit structural calculations prepared and signed by a structural engineer licensed to practice where the fabricator is located.

E. Gas cutting:

1. Do not use gas-cutting torches for correcting fabricating errors in the structural framing.

2. Cutting will be permitted only in secondary members as acceptable to the Architect.

3. When gas cutting is permitted, finish the gas cut section to a sheared appearance acceptable to the Architect.

F. Surveys:

1. Establish permanent benchmarks necessary for accurate erection of structural steel.

2. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.

G. Temporary shoring and bracing:

1. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads.

2. Provide temporary guy lines to achieve proper alignments of the structure as erection proceeds.

3. Remove temporary connections and members when permanent members are in place and the final connections have been made.

H. Setting bases and bearing plates:

1. Clean concrete bearing surfaces free from bond-reducing materials, and then roughen to improve bond to the surface by either sandblasting or waterblasting.

2. Clean the bottom surface of base and bearing plates.

3. Set loose and attached base plates and bearing plates for structural members in wedges or other adjusting devices.

4. Tighten anchor bolts after the supported members have been positioned and plumbed.

5. Do not remove wedges or shim but, if protruding, cut off flush with the edge of the base or bearing plate prior to packing with grout.

6. Pack grout solidly between bearing surfaces and bases or plates to assure that no voids remain.

7. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance with the manufacturer's recommendations as approved by the Architect.

I. Field Assembly:

1. Set structural frames accurately to the lines and elevations indicated.

2. Align and adjust members forming part of a complete frame or structure before fastening permanently.

3. Clean the bearing surface, and other surfaces that will be in permanent contact, before assembly.

4. Adjust as required to compensate for discrepancies in elevation and alignment.

5. Level and plumb individual members of the structure within specified AISC tolerances.

6. Establish required leveling and plumbing measurements on the mean operating temperature of the structure, making allowance for the difference between temperature at time of erection and the mean temperature at which the structure will be when completed and in service.

7. Comply with AISC specifications for bearing, adequacy of temporary connections, alignment, and the removal of paint on surfaces adjacent to welds.

8. Bolted connections shown on the Drawings, except as specified otherwise, are for unfinished bolts. Holes for same shall be punched or drilled 1/16 inch larger than the diameter of the bolt, except as called for otherwise on the drawings.

9. Bolting of end under connections and girder splices shall be with turned bolts in reamed holes or with torqued high-strength bolts.

3.04 TESTING AND INSPECTING (Conform to California Code Amendments, Current Edition)

A. Testing:

1. The Owner's selected testing laboratory will pick up specimens and make required tests.
2. Cost of procuring test specimens at locations more than 50 miles from the job site will be paid by the Owner and back-charged to the Contractor.
3. Costs of tests of identified stock will be paid by the Owner; except that if a test fails to comply with the specified requirements, the cost of testing will be paid by the Owner and back-charged to the Contractor.
4. Costs of tests of unidentified stock will be paid by the Owner and back-charged to the Contractor.

B. Test specimens:

1. Test specimens shall be furnished by the steel fabricator, and shall be taken under the direction of the Owner's selected testing laboratory.
2. Each specimen shall be machined by the Owner's selected testing laboratory to dimensions required by ASTM A370.
3. Cost of procuring, making, and machining test specimens shall be considered test costs as defined above.
4. Provide continuous field inspection for all in field welds and tightening of high strength bolts.

C. Identification and tests:

1. Structural steel identified by heat or melt numbers, and accompanied by mill analysis and test reports, does not require additional testing.
2. If structural steel cannot be identified, or if its source is questionable, not less than one tension test and one bend test will be made for each five tons or fractional part thereof.

D. Inspecting:

1. A complete four-sided inspection of steel will be made when required by the Architect.
2. Cost of inspecting will be paid by the Owner subject to the same provisions made above for tests.
3. If, after fabrication and inspection, the work of this Section is found to be defective and to require reinspection, cost of such reinspection will be paid by the Owner and back-charged to the Contractor.
4. Provide labor, equipment, and facilities needed to move and handle the materials to be inspected.

E. Welding inspection:

1. Unless otherwise specified, perform welding under observation of a qualified inspector from a testing laboratory approved by the Architect.
2. Inspect every layer of weld for quality, penetration, and conformity with design requirements.

3. Require the welding inspector to submit a signed report to the Architect, verifying that:

   a. The welding is adequate and was performed in conformity with the specified requirements; and

   b. Adequate methods have been used to determine the quality of the welding.

4. The welding inspector may use gamma ray, magnaflux, trepanning, or any other aid to visual inspection considered necessary to assure adequacy of welding, or may use ultrasonic testing performed in accordance with pertinent requirements of governmental agencies having jurisdiction.

5. The Owner will pay cost of welding inspection. The Contractor shall pay any reinspections required due to improper installation.

F. Access:

1. Provide access for the testing agencies and inspectors to places where structural steel work is being fabricated or produced, so that required testing and inspecting may be accomplished.

G. Erection inspecting:

1. The Owner's testing and inspecting agency will visually inspect field welded connections, will perform such additional tests and inspections of field work as are required by the Architect, and will prepare test reports for the Architect's review.

2. The testing agency will conduct and interpret the tests, and will state in each report whether the inspected work complies with the requirements, specifically stating all deviations therefrom.

H. Corrections:

1. Correct deficiencies in structural steel work which inspections and test reports indicate to be not in compliance with the specified requirements.

2. Perform additional tests required to reconfirm non-compliance of the original work and to show compliance of corrected work, all at no additional cost to the Owner.

3.05 FIELD PAINTING

A. General:

1. Prepare surfaces in a manner appropriate to the condition, and as approved by the Architect.

2. Clean spots and surfaces where primer coats have been removed, damaged, or burned off, and clean field bolts and other field connections not concealed in the finished work.

3. Remove dirt, oil, and grease.

4. Apply a spot coat of the approved primer.

5. Do not apply paint to wet, damp, oil, or improperly prepared surfaces.

B. Notify the Architect when the work of this Section is ready to receive field painting.

1. Secure inspection and approval by the Architect prior to field painting.

2. Using spray or brush, as recommended by the manufacturer of the approved paint material, fill all joints and corners and cover the surfaces with a smooth unbroken film of at least 1.5 dry mils thickness.

*****END OF SECTION*****

SECTION 05300

METAL DECK

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

A. Work included: Provide metal deck and accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.

2. Structural Steel.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. When the materials of this Section are used as part of an assembly indicated on the Drawings in which fire-resistive construction ratings are required, demonstrate approval by Underwriters' Laboratories, Inc. and the governmental agencies having jurisdiction.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Comply with pertinent provisions of Article 5 of the General Conditions.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Shop Drawings showing layout of decking, with details of materials, gages, accessories, openings, finishes, welds, and other pertinent conditions;

4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.06 PRODUCT HANDLING

Comply with pertinent provisions of Division 1.

PART 2 -- PRODUCTS

2.01 METAL DECK UNITS

Properties:

1. Form from galvanized steel sheets complying with ASTM A446, with a minimum yield strength of 33,000 psi, and coat in accordance with ASTM A525, designation G60.

2. Provide section properties shown on the Drawings.

   a. Roof: Acceptable manufacturers: A.S.C. Pacific, Inc., Type B-36, 1-1/2" deep, 20 gauge.

   b. Floor: Acceptable manufacturers: A.S.C. Pacific, Inc., Type B-36 HiForm, 1-1/2" deep, 20 gauge composite floor deck.

2.02 ACCESSORIES

A. Provide accessories specifically designed to be used with the metal deck units supplied to the work, and as normal to the uses shown on the Drawings including, but not necessarily limited to, ridge and valley plates, closures, cant strips, and sump pans if required.

B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Prior to start of installation, verify that beams are in proper alignment and that surfaces are clean for welding.

B. Place each unit on the supporting steel framework, and adjust to final position prior to permanent welding.

   1. Fasten panels to each structural support by puddle welds not less than 3/4" diameter (1/2" effective diameter) at spacing noted on Drawings, or required by code approvals.

   2. Fasten sheet metal accessories by tack welding or screwing at 6" on center.

   3. Weld sump pans, when required, directly to the deck at 6" on center around the perimeter of the pan.

   4. Panel edges (side seams) shall be welded as noted on the Drawings, or where not noted provide a minimum of 1-1/2" long seam welds at 12" on centers.

C. Complete installation in accordance with the manufacturer's recommendations.

3.03 TESTING AND INSPECTION

A. Comply with California Code Requirements Amendments to the Building Code, "Testing and Inspection."

B. Unless otherwise specified, perform welding under observation of a qualified inspector from a testing laboratory approved by the Architect and O.S.A.

C. Inspect every weld for quality, penetration, and conformity with design requirements.

D. The welding inspector is to submit a signed report to the Architect, verifying that:

1. The welding is adequate and was performed in conformity with the specified requirements; and

2. Adequate methods have been used to determine the quality of the welding.

3.04 TOUCH-UP

Upon completion of installation, and as a condition of its acceptance, visually inspect each item installed under this Section and locate surfaces where finish was damaged.

1. Touch-up galvanized surfaces with zinc-rich primer or other galvanize repair paint accepted for the purpose by the Architect.

2. Touch-up other damaged surfaces as required to return the surfaces to condition commensurate with the services required.

***** END OF SECTION *****

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SECTION 05410

METAL STUD FRAMING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

This section includes structural and non-structural cold-formed metal framing and furring systems as indicated and specified.

1.03 REFERENCES

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

1. A 653 – General Requirements for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

2. C 955 – Load Bearing (Transverse and Axial) Steels Studs, Runners (Track) and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

3. C 1007 – Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

B. American Welding Society (AWS).

1. D1.1 – Structural Welding Code.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Comply with pertinent provisions of Article 5 of the General Conditions.

B. Product Data: Submit framing manufacturer's literature, including a current I.C.B.O. Research Committee Report, showing tabulation of structural properties, load capacities, dimensions, metal gages and the type of coating for all framing and furring members. Submit powder driven fastener manufacturer's current I.C.B.O. Research Committee Report.

C. Shop Drawings: Include plans, elevations, and details for wall and ceiling framing systems and special assemblies where the design is not indicated. Show: profiles, gage, cross sections and spacing of framing members; sizes, connections including welding procedures and electrodes, attachments, reinforcing, anchorage, size and type of fasteners, and accessories required for proper installation.

D. Submit certification from manufacturer of steel framing material that all products have been rolled from new steel sheet material.

1.06 QUALITY ASSURANCE

A. Welder Qualifications: AWS Certified.

B. Regulatory Requirements: Support framing for fire resistive walls and ceilings shall conform to "Fire Resistive Standards" of the latest adopted edition of the Uniform Building Code and shall be listed in the current UL "Fire Resistance Directory".

1.07 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the project site and store them in adequately ventilated dry locations. If it is necessary to store materials outside, stack them off the ground on a platform and fully protect them from the weather.

PART 2 -- PRODUCTS

2.01 MANUFACTURER'S

Load Bearing Metal Stud System: One of the following or equal:

1. Dietrich.
2. LA Metal
3. Metal Stud Forming Corp.
4. Western Metal Lath Company.

2.02 MATERIALS

A. Steel:

1. ASTM A 653, Grade 33.
2. Yield Strength; Minimum yield strength of 33,000 PSI.
3. Galvanized to G60 in accordance with ASTM A 653.

B. Screws, Track to Stud, Stud to Stud: Self-drilling, self-tapping, hot-dip galvanized.

C. Screws, Track to Wood: Hot-dip galvanized, long enough for minimum 1-inch penetration into wood.

D. Nails, Track to Wood: Hot-dip galvanized, long enough for minimum 1-1/2 inch penetration into wood.

E. Bolts, Nuts and Washers: As specified in Section 05500, hot-dip galvanized.

F. Anchorage Devices: Powder Activated Fasteners.

G. Welding Materials: AWS D1.1.

H. Primer: As specified in Section 09900.

2.03 FABRICATION

A. Fabricate studs, runners, bracing, and bridging in accordance with ASTM C 955.

B. Studs: Minimum 20 gauge steel sheet, 3-5/8 inches wide, unless otherwise indicated on the Drawings.

C. Track: Minimum 20 gauge steel sheet, channel shaped, minimum 1-3/8 inch flanged same width as studs, for tight fit, unless otherwise indicated on the Drawings.

D. Backing for fixtures: Minimum 16 gauge steel sheet, 3-5/8 inches wide, unless otherwise indicated on the Drawings.

E. Plates, Gussets, Clips: Steel and steel sheet, thickness suitable for conditions, manufacturer's standard shapes.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 NON-STRUCTURAL WALL FRAMING

A. Erect load bearing metal stud system in accordance with ASTM C 1007.

B. Framing may be prefabricated into panels before erection. Brace panels to prevent racking. Lift panels so as to prevent local distortion of members.

C. Make provision for erection stresses. Provide temporary alignment and bracing. Align runners accurately at the floor and ceiling. Where partitions abut underside of steel or concrete construction, install runner and bent plate as detailed. Restrain lateral movement of the runners with bent plated channels.

D. Cut framing members to fit squarely against abutting members. Hold Members firmly in position until fastened.

E. Attach tracks to the floor and ceiling construction at maximum 2 inches for track ends and at maximum 24 inches on center. Fasten track to concrete with powder actuated fasteners or concrete stub nails, to steel with bolts or welds, and to wood with screws or nails. Butt-weld or splice track butt joints in accordance with AWS D1.1.

F. Use 1 piece, full-length studs without splices between tracks.

G. At curved walls, unless otherwise recommended by stud manufacturer, notch runners and form to indicated radius. Reinforce notched flanges with continuous, one inch by 25 gauge straps, clinched to runners around curve and to extend 4 inches beyond curve, where space permits. Space studs not to exceed 8 inches on center. Anchor each stud to strap reinforcing with screws.

H. Seat studs squarely in upper and lower tracks with study flanges abutting track webs. Securely attach studs to tracks. Fasten non-load bearing studs to provide for deflection. Space studs at maximum 16 inches on center, maximum 2 inches from abutting walls, and at each side of openings, unless otherwise indicated on the Drawings.

I. Connect studs to racks with screws or welds in accordance with manufacturer's instructions. Secure both stud flanges at door and window jambs, and partition intersections and corners to track flanges. Weld members that form trusses in accordance with AWS D1.1. Do not tie members with wire.

J. Framing at Doors: Unless otherwise indicated, provide no lighter than 16 gauge studs at each side of all doors or there openings through partitions. Over metal doorframes, place a cut-to-length section of runner with a web-flange bent at each end and fasten to adjacent vertical studs with 2 screws in each flange. Position a cut-to-length stud at the location of vertical joints over doorframe header extending to the top of the wall. Install a horizontal stiffener channel above each door extending to engage first stud beyond each jamb and attach channel to each stud.

K. Use minimum 3 studs at corner and minimum 2 studs at jambs of openings.

L. Frame both sides of expansion and control joints with separate studs. Do not bridge the joint with components of stud system.

M. Install cripple studs above and below openings at same spacing as full-length stud spacing.

N. Attach cross studs or furring channels to studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, grab bars and other items anchored to partitions or walls.

O. Install framing between studs for attachment of electrical boxes and other mechanical and electrical items.

P. Touch-up field welds and scratched surfaces with primer.

3.03 SUSPENDED CEILING FRAMING

A. Space number 9 hanger wires at 36 inches on center to carry 1-1/2 inch runner channels spaced 48 inches apart. Tie wires securely around channels, using at least 2 turns and attach securely to concrete or steel framing above.

B. Install 1-1/2 inch runner channels and adjust so that furring is in true and accurately level planes. Lap runner channels at least 12 inches at splices and securely tied together with number 18 wire, double wrapped 2 inches from each end of splice. Main runners and cross runners shall not be let into nor shall contact abutting partitions. Locate main runners within 6 inches of walls to support ends of cross furring.

C. Space cross furring channels or "hat" sections, as applicable, 16 inches on center (maximum) and in accordance with Uniform Building Code requirements. Saddle-tie cross furring and hat section toe each runner channel with not less than 2 strands of number 16 tie wire 1 inch from ends of splice.

D. Suspensions under Ducts and at Special Conditions: For hangers spaced from 48 inches on center to 66 inches on center (maximum), use number 6 wire hanger and 2 inch channel runners.

3.04 CLEAN-UP

On completion of work, remove all excess material, equipment, debris and cuttings; dispose of away from premises. Leave work in clean condition.

***** END OF SECTION *****

SECTION 05500

METAL FABRICATIONS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Shop fabricated ferrous metal items, galvanized and prime painted.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

B. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

C. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures.

1.05 FIELD MEASUREMENTS

Verify that field measurements are as indicated on Drawings and Shop Drawings.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Steel Sections: ASTM A36.

B. Steel Tubing: ASTM A500, 46 KSI.

C. Plates: ASTM A283.

D. Pipe: ASTM A53, Grade B.

E. Bolts, Nuts, and Washers: ASTM A307 or as indicated.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Shop and Touch-Up Primer for Steel: SSPC 15, Type 1, red oxide.

H. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.

I. Exposed Mechanical Fastenings: Flush countersunk screws or bolts.

J. Miscellaneous Items: Miscellaneous metal items and their related components are not necessarily individually described. The most important and those requiring detail description are specified. Miscellaneous items not described shall be furnished and installed in accordance with the intent of the Drawings and Standard Specifications as required to complete the work.

2.02 FABRICATION

A. Standard commercial products, conforming to requirements of Drawings and Standard Specifications may be used subject to approval of Architect. Bolt with proper size bolts. Nuts shall be drawn tight and end threads upset. Screws and bolts shall be standard and washers provided where necessary.

B. Build anchors and other connecting members required to concrete into concrete as work progresses to avoid unnecessary cutting and drilling.

C. Fit and shop assemble in largest practical sections, for delivery to site.

D. Fabricate items with joints tightly fitted and secured.

E. Continuously seal joined members by intermittent welds and plastic filler or as indicated on Drawings.

F. Execute all work using skilled metal workers only. Use only certified welders. Do only such work at the site as cannot reasonably be performed in the shop. Make cuts, bends, punching and drilling accurate, neat and properly located. Leave exposed surfaces free of fabrication marks. Make members true to length to allow assembly without fillers.

G. Do all welding per AWS Standard Specifications. Apply "Galvaweld" or equal to any surfaces welded after galvanizing.

H. Furnish all necessary templates and patterns required by other trades. Supervise and be responsible for proper location and installation of built-in terms. Deliver any items of this Section required to be embedded in concrete, or built into partitions and other locations to respective Contractors. Provide holes and connections for work of other trades and make necessary connections.

I. When possible, fit and shop assemble, ready for erection, with shop and field connections riveted, welded or attached with screws, countersunk and finished flush where exposed.

J. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

K. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with design of component, except where specifically noted otherwise.

L. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

M. Galvanize any ferrous metal exposed to exterior unless otherwise specified. All units galvanized shall be fabricated into the largest practicable sections before galvanizing.

2.03 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete, or where field welding is required.

C. Prime paint items with one coat.

D. Galvanized items to minimum 1.25-ounce/square foot zinc coating in accordance with ASTM A386.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on Drawings and Shop Drawings.

D. Perform field welding in accordance with AWS D1.1.

E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, galvanized except surfaces to be in contact with concrete.

G. Anchor firmly into position.

3.04 CLEAN-UP

On completion of work, remove all excess material, equipment, debris and cuttings; dispose of away from premises. Leave work in clean condition.

***** END OF SECTION *****

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SECTION 06200

FINISH CARPENTRY

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Supply and install complete Finish Carpentry Work as shown on Drawings and as specified herein. Provide hardware and attachment accessories as required for a complete and proper installation.

1.03 SHOP DRAWINGS

Per General Conditions, submit shop drawings of millwork at full size or large scale showing sizes, materials, grain run, methods of construction, connection to adjacent members and installation. Indicate all backing members for installations and all hardware.

1.04 MEASUREMENTS

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

1.05 QUALITY CONTROL

Following standards apply to Work of this Section except where more stringent requirements are specified herein:

1. Architectural Woodwork Institute "Quality Standards".
2. Western Wood Products Association Manual.
3. American Wood Preservers Association Specifications.

1.06 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Douglas Fir: West Coast Lumber Inspection Bureau "Standard Grading and Dressing Rules" and Western Wood Products Association, graded "C" and better, flat grain grade marked by WCLIB or WWPA.

B. Douglas Fir Plywood: U.S. Product Standard PS-1, American Plywood Association, grade trademarked "C-D", plugged, exterior glue, sanded.

C. Blocking, Furring, etc.: Standard Grade Western White Pine, Construction grade Douglas Fir or other equally sound softwood, as graded by WCLIB or WWPA.

D. Softwood Lumber: PS 20; custom grade in accordance with AWI maximum moisture content of 6%; of quality capable of transparent finish.

E. Hardwood Lumber: FS MM-L-736; custom grade in accordance with AWI; maximum moisture content of 6% of quality capable of transparent finish.

2.02 ACCESSORIES

A. Nails, bolts, nuts, washers, blind fasteners, lags and screws, size and type to suit application.

B. Wood Filler: oil base, tinted to match surface finish color.

C. Shelf Standards and Rests: Knape and Vogt #255 & #256 for recessed application. Provide two hold down clips for each shelf in the slot above

D. Closet Hanger Bars and Supports: Knape and Vogt #770, #660, #734, #735, and #1195. Provide intermediate support of spans over 6'-0".

2.03 SHOP TREATMENT OF WOOD MATERIALS

A. Shop pressure treat wood materials requiring UL fire rating or preservations.

1. Provide UL approved identification on fire retardant treated material.

B. Wood Preservative (PT type) Wolmanized, Pressure Treated Lumber, manufactured by Osmose Wood Products or approved equal.

C. Fire Retardant (FR-S Type) chemically treated, and pressure impregnated, capable of providing a maximum rating of 25; manufactured by Demose Wood Products. Dricon FRT or approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

E. Verify that surfaces and openings are ready to receive work and field measurements are as shown on Shop Drawings and instructed by the fabricator.

F. Verify that mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this work.

3.02 PRIMING

Back paint all wood surfaces inaccessible and unexposed after installation before delivery with an approved linseed oil and aluminum primer.

1. Prime coat all unfinished metal parts.

2. Prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.03 FINISH CARPENTRY INSTALLATION

A. Use only hot dip galvanized or aluminum finish or casting nails. Set nails for putty stopping in surface members. Hammer marks not acceptable on any exposed finished surface and may be cause rejection of Work by Architect.

B. Make all end splices exposed in finished members bevel splices and not square butted. Install members in as long lengths as possible.

C. Install Work to details shown, plumb, level and to line and securely anchored per AWI custom quality standard. Make scribes where required accurate. Miter corners of trim.

D. Provide and install other miscellaneous millwork items and related Work required to complete Work of this Section.

E. Prepare all woodwork installed hereunder by cleaning and sanding as required to receive finishes specified in Section "Painting and Finishing".

F. Install all doors and frames; finish hardware and bathroom accessories per manufacturer's recommendation.

G. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth and site finish.

***** END OF SECTION *****

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SECTION 06410

CUSTOM CASEWORK

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. Furnish all: labor, materials, equipment and services necessary and/or reasonably incidental to the proper execution of cabinetwork, including hardware as shown on Drawings and specified herein.

B. Work includes counters, shelving, countertops and cabinetry.

1.03 STANDARDS OF WORKMANSHIP

Quality of millwork and fabrication shall conform to:

1. Woodwork Institute of California (WIC)
2. National Kitchen Cabinet Association (NKCA)
3. American Woodworkers Institute (AWI)

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Within 35 Calendar Days after the Contractor has received the Notice To Proceed, submit:

1. Submit Shop Drawings, include materials, component profiles, fastening methods and schedule of finishes.
2. Submit samples of finishes.

1.06 WARRANTY

Contractor Guarantee: Contractor guarantees the work covered by the specification against all defects in material and workmanship for a period of not less than two (2) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Softwood plywood: PS-1 graded per AWI. Application: 3/4" for cabinets -- plastic laminated.

B. Plastic Laminate: high pressure laminated plastic conforming to NEMA LP-3, 0.50" thickness for tops, and 0.028" thickness for vertical surfaces.

1. All splashes shall be 4" high; provide end splashes with sq. bottom joints.
2. Interiors: Low Pressure Melamine.
3. Backing Sheet: LD-3-BK 20 backing grade undecorated plastic laminate.

C. Wood particleboard: Per AWI standard, composed of wood chips, made with waterproof resin binders, sanded faces, application 3/4" for countertops.

D. Hardboard: PS-58: pressed wood fiber with resin binder, tempered grade, smooth two sides for drawer bottoms.

E. Hardwood Lumber: Grade in accordance with AWI; maximum moisture content of 6%; application.

F. Plastic Edge Trim: Same as face finish -- plastic laminate.

G. Adhesive - Type II adhesive -- an approved thermosetting-on-contact adhesive.

H. Doors and drawer fronts shall be 3/4" plywood with edges veneered or plastic laminate finish.

I. Hardware: Cabinet hardware shall be concealed self-closing hinges, drawer slide, shelf-standards and clips as manufactured by Blum, Knape & Voigt or equal.

J. Drawer Slides for Drawers 24" wide or less: 100 pound load rated, full extension, ball bearing. Accuride 3832.

Drawer Slides for File, Paper Storage and Heavy Duty Drawers 42" wide or less: 150 pound load rated, over travel extension, ball bearing. Accuride 4034.

2.02 FABRICATION

A. Assemble casework in Shop for delivery to site in units easily handled and to permit passage through building openings.

B. Apply plastic laminate finish in full-uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Locate counter butt joints minimum 2' from sink cutouts.

C. Mechanically fasten splash backs to countertops with steel brackets 16" o.c.

D. Countertop edges and splashes to have radius corners.

E. Outside corners of force standing desks to be radiused per plans.

F. Apply laminated backing sheet to reverse side of plastic laminate finish surfaces.

G. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surface cut edges.

H. On items to receive transparent finishes, use wood filler that match surrounding surfaces. Apply wood filler in exposed nail and screw indentations. Sand work smooth.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

E. Verify that surfaces and openings are ready to receive work and field measurements are as shown on Shop Drawings and instructed by the fabricator. Verify dimensions for work of other trades incorporated into the casework.

F. Verify that mechanical, electrical, and other building items affecting work of this Section are placed and ready to receive this work.

3.02 INSTALLATION

A. All parts shall be precision machined to close tolerances, accurately fitted and assembled with appropriate fastening and adhesives required to produce first quality fixtures, square, true, plumb and level.

B. Carefully scribe casework that is against other building materials, leaving gaps of 1/32" maximum. Do not use additional overlay trim for this purpose.

C. Anchor securely to wall and floor with all anchorage devices required. Coordinate to allow anchorage devices to be set with other work as applicable. Provide temporary protection over finish work as required during construction to protect the work from damage.

D. Installation shall be complete including continuous bases. All work shall be installed by skilled workmen under the control and supervision of personnel trained in the handling and installation of this cabinetwork and equipment.

E. Install and adjust cabinet hardware to correct operations.

***** END OF SECTION *****

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SECTION 06600

PLASTIC SURFACING MATERIALS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 DESCRIPTION

Provide factory-finished Surface Materials, and similar items where shown on the drawings, as specified herein, and as needed for a complete and proper installation. Work may include, but is not limited to:

1. Standard Decorative Laminates.
2. Solid Surfacing.
3. Marker Board Laminate.

1.03 REFERENCES

A. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.

B. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

C. ISO 4586-2 - High Pressure Decorative Laminates; International Organization for Standardization.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Samples:

1. Selection Samples: Submit actual samples of surfacing materials to illustrate full range of colors, patterns, and finishes available.
2. Verification Samples: Submit two samples, each 12 inches square, illustrating each selected surfacing material in specified color, pattern, and finish.

B. Manufacturer's Instructions:

1. Submit manufacturer's printed installation instructions for each product.
2. Submit manufacturer's Safety Data Sheets (M.S.D.S.) for each adhesive.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

Acceptable Products: Wilsonart International, Dupont Corian, Transolid, Inc.

2.02 STANDARD DECORATIVE LAMINATES

A. Acceptable Products: Wilsonart Laminate, Formica.

B. Product Description: Decorative surface papers, impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins.

C. Standard Decorative Laminate – General Purpose Type: having the following physical characteristics:

1. Sheet thickness: 0.048-inch (1.219 mm) plus/minus 0.005-inch (0.127 mm).
2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGS.
3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 55; Smoke developed 30.
4. Patterns and Finishes: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

2.03 SOLID SURFACING MATERIAL

A. Acceptable Product: Wilsonart Gibraltar Solid Surfacing, Type 051, or approved equal.

B. Product Description: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials, and coloring agents.

1. Nominal sheet thickness: 0.50 inch (13 mm).
2. Surface burning characteristics in accordance with ASTM E 84: Flame spread less than 25; Smoke developed less than 25.
3. Liquid Absorption, ISO 4586-2, for 1/2-inch material thickness: 0.4 percent after 2 hours boiling water.

C. Izod Impact, ASTM D 256, Method A: 0.2 foot pounds per inch.

1. Tensile Modulus, ASTM D 638 Nominal: 1.7 million pounds per square inch.
2. Thermal Expansion, ASTM D 696: 0.000019-inch per inch per degree F, maximum.
3. Hardness, ASTM D 2583, Barcol Impressor: 59.
4. Flexural Modulus, ASTM D 790: 1.6 million pounds per square inch.
5. Deflection Temperature under load, ASTM D 648: 90 degrees C.
6. Stain Resistance: ANSI Z124.6 modified, Method 3.4: No effect.
7. Boiling Water Resistance, NEMA LD 3-1995, Method 3.5: No effect.
8. High Temperature Resistance: NEMA LD 3-1995, Method 3.6: No effect.
9. Radiant Heat Resistance: NEMA LD 3-1995, Method 3.10: No effect.
10. Light Resistance: NEMA LD 3-1995, Method 3.3: No effect.
11. Ball Impact Resistance, NEMA LD 3-1995, Method 3.8, one half pound ball, unsupported: 125 inches.
12. Specific Gravity: 0.977 ounces per cubic inch (1.69 grams per cubic centimeter).
13. Approximate weight: 4.2 pounds per square foot (20.5 kg/square m).
14. Weatherability: ASTM D 2565: Pass.
15. Fungus Resistance, ASTM G 21: Pass.
16. Bacterial Resistance, ASTM G 22: Pass.
17. Pittsburgh Protocol Toxicity: 66.9 grams.
18. Patterns and Finishes: Selected from manufacturer's full range of available selections, selected and approved by Architect.
19. Impact Resistance NEMA LD3-1995 (1/2 lb. Ball) SSV bonded to substrate*** Method 3.08 modified. 125" (No Failure)

20. Tensile Toughness ASTM D 638. 21 (in. – lb./in. ^{3})

21. Tensile Modulus ASTM D 638 Nominal. 1.7 x 10^{-5} lb./in.^{3}

22. Density 1.60 gram/cm^3

23. Approximate weight 4.2 lbs./ft^2

24. Pittsburgh Protocol Toxicity = 30 grams range

2.04 MARKER BOARD LAMINATES

A. Acceptable Product: Wilsonart Marker Board Laminate.

B. Product Description: Overlay saturated with melamine resins and decorative surface papers, impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins.

C. Marker Board Laminate - Horizontal Grade Type: Type 136.

1. Sheet thickness: 0.050-inch plus/minus 0.005-inch (1.27 plus/minus 0.127 mm).

2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGS.

3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 40; Smoke developed 115.

D. Marker Board Laminate - Vertical Grade Type: Type 336.

1. Sheet thickness: 0.030-inch plus/minus 0.003-inch (0.762 plus/minus 0.076 mm).

2. Exceeding performance requirements of NEMA LD 3-1995 Grade VGP.

3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 40; Smoke developed 70.

4. Colors: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

E. Marker Board Laminate - Fire-Rated Type: Type 636.

1. Sheet thickness: 0.050-inch plus/minus 0.005-inch (1.27 plus/minus 0.127 mm).

2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGF.

3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 25; Smoke developed 110.

4. Color: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

Surface preparation: Precondition surfacing materials and surfaces to receive surfacing materials in accordance with manufacturer's printed installation instructions.

3.03 APPLICATION

Install materials in accordance with manufacturer's printed instructions.

***** END OF SECTION *****

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SECTION 07210

THERMAL INSULATION

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

A. Furnish and install Thermal Insulation indicated on the Drawings and as specified herein.

B. The principal items of work include:

1. Thermal Insulation within roof.
2. Thermal Insulation within exterior walls.
3. Thermal Insulation within interior walls.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.06 GUARANTEE

Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than two (2) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Provide thermal insulation as indicated on Drawings. All insulation shall be inorganic glass fiber insulation. Insulation shall comply with ASTM Testing Standards. Fire Hazard Classification, Flame Spread Index, Smoke Developed Index, Combustibility, and Fire Endurance Ratings as required by Code.

B. Insulation shall be as manufactured by Certain-Teed, Johns-Manville, Owens-Corning, or Architect approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Verify adjacent materials are dry and ready to receive installation.

B. Verify mechanical and electrical services within walls have been installed and tested.

3.03 INSPECTION

A. Before any installation is started, determine that the other work is suitable to receive insulation.

B. 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 are corrected.

C. Remove or protect against projections in construction framing that may damage or prevent proper insulation.

3.04 INSTALLATION

A. All work shall be performed by licensed applicators, shall comply with the recommendations of the manufacturer and the National Association of Insulation Manufacturers.

B. Install insulation with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane over and between framing numbers. Secure in place. Tape seal butt ends and lapped side flanges. Tape seal tears or cuts in membrane.

C. Trim insulation neatly to fit spaces. Use batts free of damage. Install batt insulation, in wall spaces without gaps or voids.

D. Install Insulation in all indicated walls from floor to underside of roof. Secure insulation with 19-gage wire or 1" wide, 20 gage steel strips. Architect shall approve all insulation details, including methods of fastening, before commencement of the work.

3.05 CLEAN UP AND DISPOSAL

At frequent intervals during and again upon completion of work, remove from building and working premises tools and equipment, surplus materials, all rubbish and debris of whatever nature not caused by other trades, and leave the work in a clean, orderly and acceptable condition approved by the Architect.

***** END OF SECTION *****

SECTION 07550

STANDING SEAM METAL ROOFING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to comply with the Contract Documents, including, but not limited to, these major items:

1. Pre-finished, prefabricated standing seam roof system.
2. All related perimeter trim and flashings.
3. Any and all required clips, fasteners, closures, underlayments, and sealants, necessary to meet design criteria and ensure a weather-tight installation.
4. Coordination with installation of roofing substructure.
5. Coordination with installation of sheet metal.

1.03 SYSTEM REQUIREMENTS

A. Design Requirements:

1. Provide UL rated roofing system that has been tested in accordance with UL 580 test procedure.
2. Provide factory pre-formed panel system that has been pre-tested and certified by manufacturer to comply with all the specified requirements under installed conditions.

B. Structural Requirements:

1. Engineer panels for structural properties in accordance with the latest edition of American Iron and Steel Institute "Cold Formed Steel Design Manual".
2. Provide confirmation of positive and negative buckling moments and uplift capacity determined by full-scale tests in accordance with ASTM E72-80 (Chamber Method).
3. Provide UL 90 Uplift testing reports, stating that the standing seam system has been tested over solid 5/8" minimum thickness plywood substrate.
4. The system must allow for panel movement due to thermal linear expansion.

C. Regulatory Requirements:

Comply with the requirements of all applicable building codes and other agencies having jurisdiction for wind uplift rating of standing seam roofs.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

B. Shop Drawings

1. Provide small-scale drawings indicating layout of panels on entire roof.

2. Provide large-scale drawings of all edge conditions, joints, custom profiles, supports, anchorages, transitions and the like.

C. Submit samples of panel in color to be used on the project. Panel portions shall include part of seam and ridge.

1.06 QUALITY ASSURANCE

A. Applicator shall possess all required licenses for work in this jurisdiction and have five years experience in installing standing seam metal roofs. Applicator shall supply a written two (2) year warranty covering all repairs required to maintain the roof and flashings in watertight conditions.

B. Manufacturer shall supply a twenty-year warranty on finish per ASTM D 2244-68 and ASTM D659-74.

1.07 DELIVERY AND STORAGE

A. Protect products and accessories from damage and discoloration during transit and at the site. Store sheets in a dry area to prevent condensation. Store flat and under cover until ready for use.

B. Deliver all materials in original packaging, identified with seals unbroken.

C. Do not overload roof structure with stored materials. Do not permit material storage or traffic on completed roof surfaces.

1.08 GUARANTEE

A. Roofing Contractor shall guarantee all work against defects in materials and workmanship for a period of two (2) years as required in the General Conditions prior to final payment.

B. In addition, the Finish shall have a twenty (20) year warranty against fading, chalking, peeling, cracking, chipping or delaminating.

PART 2 -- PRODUCTS

2.01 STANDING SEAM METAL ROOF

A. Manufacturer:

1. Acceptable products include TBC SS-200 Structural Standing Seam UL 90 panels by TBC/Tomen.

2. Submit for approval by Architect prior to submitting Bid.

B. Product:

1. Furnish: size(s), color(s), pattern(s) and shape(s) as indicated on the drawings.

2. Provide standard accessory shapes as required and as accepted by Architect.

3. Use appropriate trim shapes to conform to drawings.

C. Materials.

1. Metal roofing panels are to be manufactured from pre-finished Galvalume sheet consisting of 55% aluminum, 1.6% silicon and the balance in zinc per ASTM A792.
2. Panels are to be a minimum of 24-gauge and manufactured in 20" widths with 3/4" legs. Provide full-lengthened panels from ridge to eave.
3. Seam covers are to be 24-gauge material 1-1/2" high and located on 20" on center.
4. Provide a continuous, factory installed, high grade, sealant located at the upper inside edge of the seam cover.
5. Provide related flashings and trim to match roof finish. Any exposed trim to have an uninterrupted vertical face 6" in width and 22-gauge thickness.
6. Rake, Ridge and eave trim: provide trims compatible with the roofing system and manufacturer's recommended attachments.
7. Hold down / panel clips as required for UL listing for 12-gauge Galvanized Steel with 22-gage stainless steel tabs.
8. Zee closures and sealants as required for weathertight insulation. Roofer shall be responsible for all materials and installation required to provide a complete guaranteed system.

2.02 FINISH

A. Fluoropolymer Coating: Full-strength 70% Kynar 500 coating baked on to form dry film thickness of 1.0-mil over a 0.3-mil baked-on epoxy primer, coated by a licensed applicator.

B. Finish is to be premium color unless noted otherwise on the Roof Plan or Exterior Elevations.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Verify that deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains, valleys or eaves.

E. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, and that cant strips and reglets are in place.

F. Beginning of installation means acceptance of conditions.

3.02 GENERAL INSTALLATION

A. Provide one layer of #30 felt with horizontal overlaps and end laps staggered between rows. Lay parallel to ridge line with 4" horizontal laps and 12" vertical laps. Mechanically attach to substrate at 12" o.c.

B. Comply with manufacturer's instructions for assembly, installation and erection as applicable to this project's conditions and supporting substrate, in order to achieve weather-tight installation. Install with accordance to approved Shop Drawings. Panel seams shall interlock without use of field seaming machines. Compression ribs or button punching will not be allowed. Exposed fasteners in roofing panels will not be allowed.

C. Isolate materials at any point of contact with dissimilar metals by back coating metal with protective paint or applying tape between metals. Facilitate drainage to minimize possibility of galvanic action.

D. Installers shall use rubber sole shoes while working on the metal roof. Always protect the panel surface.

E. Fully seat adjacent panels to achieve continuous engagement of standing seam joint. Make end cuts and install sealant and flashings to achieve weathertight installation per manufacturer's recommendations.

F. Replace any materials that have been damaged or have deteriorated beyond successful repair per the Architect's review.

3.03 CLEANING

A. Remove temporary coverings and strippable films if any as each panel is installed.

B. Clean exposed surfaces of work promptly after completion of installation. Remove all metal clippings and filings carefully to avoid damage to the finish.

C. Protect work as required to ensure roofing will be without damage at the time of final completion.

D. Replace damaged work that cannot be restored to original condition.

***** END OF SECTION *****

SECTION 07600

FLASHING & SHEET METAL

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to comply with the Contract Documents, including, but not limited to, these major items:

1. All metal wall flashings, related flashing, coping and caps.
2. Flashing at curbed openings, and other miscellaneous areas where indicated on the drawings.
3. Flashing flanges for roof drains and overflows.
4. Flashing at parapet walls that receive roofing membrane.
5. Flashing and metal covers at mechanical equipment platforms.
6. Gutters and downspouts.
7. Shop and field priming, shop painting, galvanizing, screening, caulking, anchors and anchor straps, clips, etc.
8. Shop drawings of all sheet metal work including expansion joints.

1.03 QUALITY ASSURANCE

A. Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces.

B. Report to the Architect all conditions that prevent proper execution of this work.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Shop Drawings: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit: all information required for fabrication, finishing and installation of this work in complete details.

1.06 GUARANTEE

Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than two (2) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Galvanized Sheet Metal: Conform to ASTM A525, thickness indicated or specified, but not less than 24-gauge. Zinc coating shall weigh not less than 1-1/2 ounces, or more than 1-1/2 ounces per square foot of surface covered.

B. Solder: Standard Grade-A brand of 50:50 Alloy Lead-Tin, complying with ASTM B32. Name of manufacturer and grade designation shall be cast or die-marked on each bar.

C. Solder Flux: Raw muratic acid for galvanized metal and zinc; resin for tin, lead, and tinned copper; and non-corrosive soldering salts for uncoated copper.

D. Sheet Metal Fasteners: Rivets, nails, sheet metal screws, self-tapping screws, and stove bolts, of the type and size best adapted to the condition of use. Provide fasteners of the type specified or indicated.

1. Use: galvanized steel, cadmium-plated steel or 300 Series alloy stainless steel.

2. Pop rivets may be used for metal-to-metal connections when future disassembly is not required. Open-end type may be used for all applications except where watertight connections are required, in which case, use closed end type.

E. Caulking Compound: Provide as specified under Section 07900. Apply as recommended by the manufacturer; caulking compound of proper consistencies for gun and knife application as necessary.

F. Shop Prime Coat: Rust-Oleum Corporation. Apply #3202 to 1/2 mil wet coating thickness, #3268 to 1-mil dry coating thickness or provide primer as specified under Section 09900.

G. Shop Color Coat: Pre-coat in shop with coating of color to match adjoining surfaces.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FABRICATION AND ASSEMBLY

A. Workmanship: Fabricate and finish metal work in a first class manner in accordance with best trade practices with all joints and corners accurately machined, filed and fitted, and rigidly framed together and connected. Carefully match components to produce perfect continuity of line and design. Make joints and connections in exterior face metal watertight, using approved scaling materials and methods of assembly. Fit faces of metal in contact with hairline joints, except as otherwise indicated or required for expansion or fitting. Conceal fastenings, unless otherwise indicated. Conceal required reinforcements within the finished assembly.

B. Expansion and Contraction: Form and fabricate work to adequately provide for thermal expansion and contraction and building movement in the completed work, without over-stressing the materials, breaking connections, or producing wrinkles and distortion in finished surfaces. Finish sheet metal work water and weathertight throughout.

C. Attachment Clips: Where subject to thermal expansion and contraction, attach members with clips to permit movement without damage to the installation, or provide slotted or over-size holes with washers where appearance is not critical, as approved by the Architect.

D. Lock Seams: Make lock seam work flat and true to line; sweat full of solder except where installed to permit expansion and contraction. Lap flat lock seams, and lap seams where soldered, according to pitch but in no case less than 4". Make seams in direction of flow.

Fill expansion joints with sealant. Plane surfaces shall be free of buckles. Provide reinforcement as necessary. Cleat and fasten substantially on approximately eight-inch centers. All cap flashing and gutter seams to be flat lock seams.

E. Soldering: Thoroughly clean and tin material prior to soldering. Solder with heavy coppers of blunt design, properly tinned before use. For flat seam work they shall not weight less than ten pounds per pair, and for other work not less than size pounds per pair. Solder slowly with well-heated coppers, heating the seams thoroughly and completely filling them with solder. Finish surfaces neatly, full flowing and smooth. Wash acid flux thoroughly with a soda solution after soldering and completely remove soldering flux on exposed surfaces.

F. Welding: Conform to the requirements of AWS "Standard Code for Arc and Gas Welding". Perform welding in a manner resulting in strong, durable, tight, flush, smooth, and clean joints. Weld sheet steel to produce full and complete fusion welds without inducing locked-in stresses in the metal or surface distortions. Welding on exposed surfaces shall be ground smooth and flush and finished to match adjacent surfaces.

G. Caulking: Where indicated, caulk joints in sheet metal work and between sheet metal work and adjacent construction with polysulfide sealing compound. Apply in accordance with Caulking and Sealants Section.

H. Coping: Shall be attached to top of parapets in strict conformance with the latest written specifications of the Sheet Metal Industry Fund of Los Angeles, and as indicated on the drawings.

I. All sheet metal work shall be examined carefully the Contractor, Owner and Architect and if necessary, tested. The Contractor shall make all repairs to damaged items as a result of this testing, leaving them in a condition satisfactory to the Architect.

***** END OF SECTION *****

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SECTION 07720

ROOF HATCHES & SAFETY RAILING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

A. Work included: Provide roof hatch system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Section includes:

1. Roof hatches
2. Automatic smoke vents
3. Hatch railing safety system

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Provide units listed by Underwriters Laboratories, Inc. and/or Factory Mutual Research Corporation (FMRC).

C. OSHA compliant roof hatch safety railing system as required by OSHA Standard 1910.23 and 1910.27.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article of 5.3 the General Conditions.

1.05 SUBMITTALS

A. Comply with pertinent provisions of Article 5 of the General Conditions.

B. Product Data: Manufacturer's specifications and technical data including the following.

1. Detailed specification of construction and fabrication.
2. Manufacturer's installation instructions.

C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures.

D. Quality Control Submittals:

1. Statement of qualifications.

E. Contract Closeout Submittals: Comply with Section 01900.

1. Operating and maintenance manuals.

1.06 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

B. Package and ship in accordance to manufacturer's recommendations.

C. Store in compliance to manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Verify drawing dimensions with actual field conditions.

B. Inspect related work and adjacent surfaces.

C. Determine specific locations for personnel access to roof for location of roof hatches.

D. Determine type of stair or ladder needed for roof access - needed to determine size of hatch.

E. For location of automatic smoke vents, refer to building codes for venting requirements.

PART 2 -- PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Nystrom Building Products: (800) 547-2635. Internet: www.nystrom.com

B. Roof Hatch Safety-Railing System: David/Randall (877) 723-3766

C. Substitutions: Under provisions of Section 01340.

2.02 ALUMINUM ROOF HATCHES

A. Acceptable Manufacturers: Subject to compliance with requirements of the Contract Documents, acceptable manufacturers are as follows or approved equal:

1. Size: As indicated on the drawings.

2. Model: Nystrom Model RHA

B. Description:

1. Cover and liner: 11-gauge (.090-inch) aluminum cover with 1-inch insulation and 18-gauge (.040-inch) aluminum cover liner.

2. Curb: 11 gauge (.090-inch) aluminum curb with 1-inch rigid fiberboard insulation. Curb to be configured to match roof pitch.

3. Hinges: Tamperproof hinge contained within hatch as part of spring assembly.

4. Latch: Zinc plated steel slam latch with turn handle and inside/outside padlock hasps.

5. Finish: Mill finish

6. Springs: Greased heavy-duty compression springs in telescoping tubes.

7. Hardware: Zinc plated steel hold open arm(s) with rubber handle that automatically locks the door when opened. Furnish hatches with interior padlock hasp and neoprene draft seal.

8. Mounting flange: 3-1/2 inch.

2.03 GALVANIZED STEEL ROOF HATCHES

A. Acceptable Manufacturers: Subject to compliance with requirements of the Contract Documents, acceptable manufacturers are as follows or approved equal:

1. Size: As indicated on the drawings.

2. Model: Nystrom Model RHG

B. Description

1. Cover and liner: 14-gauge (.075-inch) galvanized steel cover with 1-inch insulation and 22-gauge (.0299-inch) galvanized steel cover liner.
2. Curb: 14-gauge galvanized steel with 1-inch rigid fiberboard insulation at curb perimeter. Curb to be configured to match pitch of roof.
3. Hinges: Tamperproof hinge contained within hatch as part of spring assembly.
4. Latch: Zinc coated steel slam latch.
5. Finish: Factory applied powder coat.
6. Springs: Greased heavy-duty compression springs in telescoping tubes.
7. Hardware: Zinc plated steel hold open arm(s) with rubber handle that automatically locks the door when opened. Furnish hatches with interior padlock hasp and neoprene draft seal.
8. Mounting flange: 3½".

2.04 ALUMINUM AUTOMATIC SMOKE VENTS

A. Acceptable Manufacturers: Subject to compliance with requirements of the Contract Documents, acceptable manufacturers are as follows or approved equal:

1. Size: As indicated on the drawings.
2. Nystrom Model SVA

B. Description:

1. Cover and liner: 11-gauge (.090-inch) aluminum cover with 1-inch insulation and 18-gauge (.040-inch) aluminum cover liner. Curb to be configured to match roof pitch.
2. Curb: 11 gauge (.090-inch) aluminum with 1-inch rigid insulation at curb perimeter.
3. Hinge: Tamperproof hinge contained within vent as part of spring assembly.
4. Latch: Positive hold/release mechanism designed to hold the covers closed against 20-lbs./sq. ft. uplift force. Released either manually or by either fusible melt out link or electric/thermal resettable link.
5. Finish: Mill finish.
6. Springs: Greased heavy-duty compression springs enclosed in telescopic tubes, designed to open vent covers automatically against 10-lbs./sq. ft. wind or snow load when released.
7. Hardware: Heavy-duty shock absorbers, neoprene draft seal, inside and outside manual release cables.
8. Mounting flange: 3½".
9. U.L/F.M. Listing: The pyrolatch with fusible melt-out link is UL listed. Only eight sizes of double and quad-leaf models are UL and FM approved, excluding size 48 x 60."

2.05 GALVANIZED STEEL AUTOMATIC SMOKE VENTS

A. Acceptable Manufacturers: Subject to compliance with requirements of the Contract Documents, acceptable manufacturers are as follows or approved equal:

1. Size: As indicated on the drawings.

2. Nystrom Model SVG

B. Description:

1. Cover and liner: 14-gauge (.075-inch) galvanized steel cover with 1-inch insulation and 22-gauge (.0299-inch) galvanized steel cover.

2. Curb: 14-gauge (.075-inch) galvanized steel with 1.0-inch rigid fiberboard insulation at curb perimeter. Curb to be configured to match pitch roof.

3. Hinge: Tamperproof hinge contained within vent as part of the spring assembly.

4. Latch: Positive hold/release mechanism designed to hold the covers closed against 20-lbs./sq. ft. uplift force. Released either manually or by either fusible melt-out link or electric/thermal resettable link.

5. Finish: Factory applied powder coat.

6. Springs: Greased heavy-duty compression springs enclosed in telescoping tubes, designed to open vent covers automatically against 10 lbs./sq. ft. wind or snow load when released.

7. Hardware: Heavy-duty shock absorbers, neoprene draft seal, inside and outside manual release cables.

8. Mounting flange: 3 ½"

9. U.L/F.M. Listing: The pyrolatch with fusible melt-out link is UL listed. Only eight sizes of double and quad-leaf models are UL and FM approved, excluding size 48 x 60."

2.06 SAFETY RAILING SYSTEM

A. Nystrom Safety Railing System: Model: Select railing model to match specified hatch types from selection chart attached to this guide specification. For multiple hatch types indicate hatch designation and railing model.

B. Description: Top rail, mid rail, and chain or swinging gate, with the hatch curb acting as the toe plate.

1. Test load: 200-pounds.

2. Height: Minimum 42 inches above finished roof deck.

3. Pipe: Galvanized, 1-1/4 inch ID, A53 Grade B seamed pipe or galvanized, 1-5/8 inch OD A500 seamed tube.

4. Flat bar: 2 x 3/8 inch thickness A36 mild steel.

5. Chain system: 3/16-inch proof coil ASTM specification, zinc plated with quick link on fixed end.

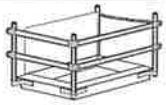
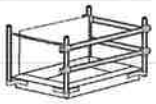
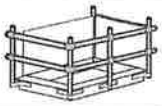
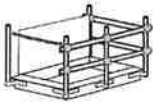
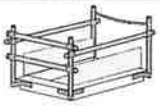
6. Pipe ends and tops: Covered or plugged with weather and light resistant material.

7. Bolts and washers: 3/8 x 2-1/2 inch grade Z, zinc plated.

8. Sealant: As recommended by manufacturer.

9. Factory finish: Hot dipped galvanized.

C. Nystrom Safety Railing System selection Chart:

MODEL:	DESCRIPTION:	PICTURE:
RHSR-SS (size)	Nystrom Safety Railing System for standard 2'-6" x 3' roof hatches and with hatchway ladder mounted on 2'-6" side of hatch opposite of hinge lid.	
RHSR-FB-EL (size)	Nystrom Safety Railing System with forward barrier exit left for a hatch up to 2'-6" x 4'-6" where a left exit is desired, or where hatchway exit is close to the roof edge or opens up to an obstruction.	
RHSR-FB-ER (size)	Nystrom Safety Railing System with forward barrier exit right for a hatch up to 2'-6" x 4'-6" where a right exit is desired, or where hatchway exit is close to the roof edge or opens up to an obstruction.	
RHSR-FB-EEL (size)	Nystrom Safety Railing System with forward barrier end exit left (exit left with back to hinge) for roof hatches up to 4' x 8' with a ladder or stairway.	
RHSR-FB-EER (size)	Nystrom Safety Railing System with forward barrier end exit right (exit right with back to hinge) for roof hatches up to 4' x 8' with a ladder or stairway.	
RHSR-O (size)	Nystrom Safety Railing System with offset handles for where hatchway ladder or stairway is mounted opposite of hatch lid hinge and where hatch dimension on mounting side exceeds 30".	
RHSR-DL (size)	Nystrom Safety Railing System for double-leaf roof hatches.	

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Check openings for correct size and irregularities.

C. Correct conditions detrimental to timely and proper completion of the Work.

D. Do not proceed until unsatisfactory conditions are corrected.

E. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Comply with manufacturer's recommendations.

C. Securely anchor roof accessories in compliance with manufacturer's instructions.

D. Set units plumb, level, and true to line without warp or rack.

E. Apply bituminous paint on metal surfaces of units in contact with cementitious materials and

dissimilar metals on roof units.

F. Set railing brackets in sealant.

G. Put operating components through at least five complete operating cycles, adjusting as required, and achieving optimum ease of operation.

3.03 FIELD QUALITY CONTROL

A. Smoke Hatch Testing: Test for proper operation after installation by fusing the links and also test fusible link release system.

B. Adjust and retest as required until units operate satisfactorily.

C. Close hatches, replace links, and leave units in an operable condition.

D. Touch up coatings as required.

***** END OF SECTION *****

SECTION 07840

FIRE STOPPING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

A. Work included: Provide firestopping where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. It is the intent of this section of the specifications to establish a single, competent source to be responsible for providing all labor, materials, products, equipment and services, to supply and install the firestopping and smoke seal work for the entire project, at the following locations, as indicated on the drawings:

1. Openings in fire rated walls, floors and roofs both empty and those containing penetrations such as cables, conduits, cable trays, pipes, ducts and similar penetrating items.
2. Gaps between fire-rated floor slabs and exterior curtain walls.
3. Gaps between fire-rated walls and exterior curtain walls.
4. Gaps located within expansion joints.
5. Gaps between the tops of fire rated walls and underside of fire rated floor or roof assemblies.
6. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
7. Openings at each floor level in fire rated shafts or stairwells.

1.03 RELATED WORK

A. Openings through Floors and Walls:

1. Fire Rated: Metal sleeves for fire rated openings through floors and walls shall be provided under applicable mechanical and electrical specification sections.
2. Non-Rated: Non-rated openings through floors and walls shall be sealed under applicable mechanical and electrical specification sections.

B. Firestopping and smoke seals within mechanical (i.e. inside ducts, dampers) and electrical assemblies shall be sealed under applicable mechanical and electrical specifications sections and only in accordance with the equipment or device manufacturers' installation instructions. Firestopping and smoke seals around outside of such mechanical and electrical assemblies, where they penetrate fire rated separations, are the responsibility of this section.

1.04 REFERENCE STANDARDS/DOCUMENTS

A. ASTM E814 - Test Method of Fire tests of Through Penetration Firestops.

B. ANSI/UL 1479 - Fire Tests Of Through-Penetration Firestops

C. ANSI/UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems

D. UL: Fire Resistance Directory, Volume 2.

E. ITS: Directory of Listed Products.

F. Factory Mutual, Approvals Guide

1.05 SYSTEM DESCRIPTION

A. Firestopping Materials: Provide firestopping system(s) of sufficient thickness, width and density to provide and maintain a fire resistance rating, as indicated on drawings and in accordance with [UL], [WH], or [FM] design numbers.

B. Provide a seal completely filling all annular spaces to prevent the passage of flame, smoke and gases through the opening in the fire separation in which it is installed.

C. Material Compatibility: Provide materials which are compatible with all materials used in the system including materials used in or on penetrating items as well as all construction materials used in conjunction or contiguous with the system.

D. Accessories: Provide components for each firestopping system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems. Accessories include but are not limited to the following items:

1. Permanent forming/damming/backing materials
2. Temporary forming materials
3. Substrate primers
4. Collars
5. Steel sleeves

1.06 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.07 SUBMITTALS

A. Manufacturer's Data: Submit manufacturer's specifications, installation instructions and product data for each material required. Include [UL], [WH], or [FM] tested systems or designs to show compliance with the Contract Documents.

B. Shop Drawings: Submit shop drawings showing typical installation details including reinforcement, anchorage, fastenings and method of installation for each type of firestopping condition.

C. Samples: If requested, submit samples of each type of firestopping systems, smoke seals and accessories. Indicate location where material/system shall be utilized.

1.08 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products of this Section with minimum ten (10) years documented experience, and having a quality management system that is registered as conforming to the requirements of ISO9001.

B. Applicator: Company having a minimum of three (3) years experience in the installation of materials specified herein on projects comparable to this project. The firm shall have the written authorization of the firestopping material manufacturer (s).

1.09 REGULATORY REQUIREMENTS

A. Conform to applicable local Building Codes for fire resistance ratings.

B. Provide materials, accessories and application procedures which have been listed by [UL], [WH], [FM] or [tested by a nationally recognized independent testing agency] in accordance with [ASTM E814], [ANSI/UL 1479], or [ANSI/UL 2079] to achieve the required fire protection rating(s).

1.010 ENVIRONMENTAL REQUIREMENTS

A. Do not proceed with the installation of firestopping materials when temperatures or weather conditions exceed the manufacturer's recommended limitations for installation.

B. Ventilate solvent based and moisture-cure firestopping per firestopping manufacturer's instructions by natural means or, where this is inadequate, by forced air circulation.

1.011 DELIVERY, STORAGE AND HANDLING

Deliver materials to Site in manufacturer's sealed and labelled containers intact. Handle and store materials in accordance with manufacturer's instructions.

1.012 PROJECT/SITE CONDITIONS

Comply with manufacturer's recommended requirements for temperature, relative humidity and substrate moisture content during application and curing of materials.

1.013 SEQUENCING AND SCHEDULING

Do not install firestopping system(s) until Work within opening has been completed. Coordinate with other applicable Sections. Schedule work of other trades so that firestopping applications can be inspected prior to being covered by subsequent construction.

PART 2 -- PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Provide firestopping silicone sealants, water-based sealants, intumescent sealant, mortars, or firestop devices from the following manufacturer:

A/D Fire Protection Systems Inc. or Architect approved equal.

2.02 MATERIALS

A. Provide a complete system of asbestos-free firestop systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of [ASTM E814], [ANSI/UL 1479], or [ANSI/UL 2079] and listed by [UL], [WH], or [FM] and in addition are approved by jurisdictional authorities and the Consultant.

B. A/D FIRE BARRIER Silicone Sealants: For use in: openings with penetrating items subject to high movement; multiple penetration systems; for combustible pipes up to 2-in. diameter; in control joints; in curtain wall joints; expansion joints; floor/wall joints; wall/wall joints; head of wall joints; and as a sealant for smoke barrier construction.

C. A/D FIRE BARRIER Intumescent Caulk: For general use as a firestop sealant with: insulated pipes; pipes; electrical cables and conduit; ducts.

D. A/D FIRE BARRIER Seal and Seal NS: Water based firestop sealants for use with: control joints; head of wall joints; floor/wall joints; wall/wall joints; multiple penetration systems; plumbing; mechanical; electrical; and where sprayed sealant application is required or desired.

E. A/D FIRE BARRIER Mortar: For use in: large openings; static non-moving penetrations such as cable trays; for multiple penetration systems; electrical and communication bundles; conduits; non-combustible sleeves; and insulated pipes.

F. A/D FIRE BARRIER Collars: For use in openings with single combustible pipe penetrations greater than 2-in. diameter.

G. A/D FIRE BARRIER Pillows: For use in openings with: cable tray; multiple cable penetrations; where retrofitting of penetrating items is anticipated, and as a temporary fire stop system.

H. Fire stop system ratings: Comply with applicable Building Code requirements for locations and ratings.

2.03 ACCESSORIES

A. Damming and backup materials, supports and anchoring devices: Non-combustible, to manufacturer's recommendations and in accordance with the tested system being installed as acceptable to jurisdictional authorities.

B. Primers: As required by firestopping manufacturer and compatible with selected system and contiguous materials.

C. Water: Potable.

D. Firestopping for vertical (wall) applications: Non-sag caulk or spray grade sealants, Mortar, Collars or Pillows.

E. Firestopping for horizontal (floor) applications: Non-sag caulk or self-levelling or spray grade sealants, Mortar, Collars or Pillows.

F. Firestopping for overhead applications: Non-sag caulk or spray grade sealants or Mortar.

G. Tape: Pressure sensitive masking tape as recommended by the firestopping manufacturer.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Examine substrates, openings, voids, adjoining construction and conditions under which the Work is to be installed. Confirm compatibility of surfaces scheduled to receive firestopping.

C. Correct conditions detrimental to timely and proper completion of the Work.

D. Verify that penetrating elements are securely fixed and properly located with the proper space allowance between penetrations and surfaces of openings.

E. Do not proceed with Work until unsatisfactory conditions are corrected.

F. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Surfaces to receive firestopping shall be free of dirt, dust, grease, oil, rust, loose materials, form release agents, frost, moisture or any other matter which would impair the bond of firestopping material to the substrate of penetrating item(s).

B. Prime substrates in accordance with manufacturer's written instructions or recommendations. Confine primers to areas of bond; do not allow spillage or migration onto exposed surfaces.

C. Do not apply firestopping and smoke seals to surfaces previously painted or treated with sealers, curing compounds, water repellent or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

D. Ensure that anchoring devices, back-up materials, clips, sleeves, supports and other related materials used in the actual fire tests are provided.

E. Mask where necessary to prevent firestopping materials from contacting adjoining surfaces that will remain exposed upon completion of Work. Remove tape as soon as it is possible to do so without disturbing firestopping seal with substrates.

F. Installation is not to proceed until submittals have been completed.

3.03 INSTALLATION

A. Manufacturer's Instructions: Comply with [UL], [WH] or [FM] Listings and manufacturer's instructions for the type of material and condition of opening in each case. Consult with the manufacturer's technical representative to determine proper procedure for conditions not fully covered by printed instructions. Record in writing any oral instructions received, with copy to manufacturer.

B. Install firestopping with sufficient pressure to properly fill and seal openings to ensure an effective smoke seal. Tool or trowel exposed surfaces. Remove excess firestopping material promptly as the Work progresses and upon completion.

C. Damming: Provide leak-proof dams as required to seal openings and contain liquid sealants, putty or mortar until cured. Install damming in accordance with manufacturer's instructions.

D. Damming Boards: Install forming/damming materials and other accessories of type required to support fill materials during their application and in the position needed to produce the shapes and depths required to achieve fire ratings of through-penetration fire stop systems.

1. Combustible Type: For temporary dams only. Remove after firestopping material has cured.

2. Non-Combustible Type: For temporary or permanent dams. Provide non-combustible type wherever damming material cannot be removed after applying firestopping materials.

E. Void Filler: Use materials recommended by the firestopping manufacturer to seal gaps created by non-combustible type damming boards and to seal around cables, conduits, pipes and where void filler material becomes part of the fire rated assembly.

F. Sealant: Install damming material or mineral wool as required. Apply sealant so air voids are not present and sealant is in full contact with penetrating items. Tool sealant to ensure substrate contact. Remove excess sealant in accordance with manufacturer's recommendations.

G. Mortar: Install damming material as required. Mix mortar in strict accordance with manufacturers instructions. Pump, trowel or hand pack mortar through openings to minimum thickness as recommended by manufacturer and as listed by [UL], [WH] or [FM], to achieve required fire rating.

H. Firestopping Mineral Wool: Install firestopping by compressing material to the minimum required by [UL], [WH] or [FM] listing. Apply firestopping in sufficient thickness, depth and density so as to achieve the required fire resistance rating. Use impaling clips to support and secure firestopping where required by tested system.

3.04 FIELD QUALITY CONTROL

A. Notify Consultant when completed installations are ready for inspection prior to concealing or enclosing an area containing firestopping materials.

B. Arrange for inspections by the Owners independent inspection and testing company, appointed and paid for by Owner.

C. Following field inspections, provide all repair as required to ensure compliance with the Contract Documents.

3.05 CLEANING AND PROTECTION

A. Upon completion of this work, remove all materials, equipment and debris from the site.

B. Leave work area and adjacent surfaces in a condition acceptable to the Consultant.

C. Leave installed work with sufficient protection to enable it to remain untouched until project turnover.

END OF SECTION

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SECTION 07900

CAULKING AND SEALANTS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work included: Throughout the work, seal and caulk joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture and passage of air.

1.03 QUALITY ASSURANCE

A. Conform to Sealant and Waterproofers Institute requirements for materials and installation.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

C. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

D. Warranty: Provide written warranty for all caulking and sealants against all defects of material or application for a period of five (5) years after date of acceptance. All failures that may occur within this period due to defective application or materials shall, upon written notification of such failures, be repaired or replaced with proper materials and labor as accepted by the Architect, at no additional cost to the Owner.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items that will be provided under this Section.
2. Manufacturer's Data: catalog cuts, dimensioned drawings, and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 WARRANTY

A. The guarantee specified herein shall include warranties against leakage, hardening, cracking, crumbling, melting, running, shrinking or staining adjacent surfaces.

B. Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than five (5) years from the date of Substantial Completion.

PART 2 -- PRODUCTS

2.01 SEALANTS

A. Except as specifically otherwise accepted by the Architect, use only the types of sealants described as follows:

1. One component polyurethane sealant, moisture curing, low modulus, FS TT-S-0023OC, Type II, Class A, ASTM-C-920, Class 25, for vertical and horizontal joints in connection with all building materials. Do not use in traffic areas. Minimum ¼" joint; maximum 1-1/4" x 3/8"d.

   a. Dymonic by Tremco

   b. Sonolastic NP1 by Sonneborn

2. One-part silicone sealant, moisture curing, low modulus, FS TT-S-0023OC, Type II, Class A, FS TT-S-001543A, Class A, for vertical and horizontal joints in connection with aluminum, glass and concrete materials which require greater movement capabilities. Do not use in traffic areas. Minimum joint ¼" x 3/16"d; maximum1" x ½"d.

   a. Spectrum 1 by Tremco

   b. Omniseal by Sonneborn

   c. Dow Corning 790

3. One-part silicone sealant, medium modulus, neutral cure, FS S-0023OC, Type II, Class A, FS TT-S-001543A, Type II, Class A, ASTM C920, Class 25, for vertical and horizontal joints in connection with non-porous surfaces such as aluminum, glass, tile, laminated plastic and concrete. Do not use in traffic areas.

   a. Spectrum 2 by Tremco

   b. Omni Plus by Sonneborn

   c. Dow Corning 795

   d. Construction 1200 by GE

4. Multi-Component polyurethane sealant, FS TT-S-00227E, Type I, Class A, ASTM C920 for horizontal joints in traffic areas. Minimum 3/8" wide, depth to be 3/8" to ½" - use primer.

   a. THC-900/901 by Tremco

   b. Chem. Caulk 950 by Bostick

5. One-part translucent silicone sealant, low modulus, moisture curing, FS TT-S-0023OC, Type II, Class A, FS TT-S-001543A, Type II, Class A, for vertical joints in connection with butt glazing.

   a. 895 Silicone by Pecora

   b. Silglaze N by GE

6. One-part mildew resistant silicone sealant meeting requirements of FDA Regulation 21 CFR 177.2600, for vertical and horizontal joints in connection with non-porous applications as sealing around bathroom fixtures, shower-tub enclosures, sinks and urinals.

   a. Dow Corning 786

   b. Sanitary 1700 by GE

7. One-part siliconized acrylic latex polymer caulk, ASTM C834-76, for interior horizontal and vertical joints in connection with window and door buck perimeters, interior wall surfaces, etc.

   a. AC-20 by Pecora

   b. Acrylic Latex by Tremco

8. Roof Penetrations: Use asphalt mastic conforming to ASTM D491.

9. For other services, provide products especially formulated for the proposed use and accepted in advance by the Architect.

B. Colors:

1. The Architect will select Colors for each sealant installation to match adjacent finishes from a standard color list normally available from the specified manufacturers.

2. Should a matching standard color not be available from the accepted manufacturer except at additional charge, the Contractor shall provide such colors at no additional cost to the Owner.

3. In concealed installations, and in partially or fully exposed installations where so accepted by the Architect, use standard gray or black sealant.

2.02 PRIMERS

Use only those primers that are: non-staining, have been tested for durability on the surfaces to be sealed, and are specifically recommended for this installation by the manufacturer of the sealant used.

2.03 BACKUP MATERIALS

A. Use only those backup materials that are specifically recommended for this installation by the manufacturer of the sealant used, which are non-absorbent, and which are non-staining.

B. Acceptable types include:

1. Closed-cell resilient urethane or polyvinyl chloride foam;

2. Closed-cell polyethylene foam;

3. Closed-cell sponge of vinyl or rubber;

4. Polychloroprene tubes or beads;

5. Polyisobutylene extrusions;

6. Oil-less dry jute.

C. Preformed support strips for ceramic tile control joint and expansion joint work: Use polyisobutylene or polychloroprene rubber.

2.04 BOND-PREVENTATIVE MATERIALS

Use only one of the following as best suited for the application, and as recommended by the manufacturer of the sealant used:

1. Polyethylene tape, pressure-sensitive adhesive, with the adhesive required only to hold tape to the construction materials as indicated;

2. Aluminum foil complying with MIL-A-148E;

3. Wax paper complying with Fed. Spec. UU-P-270.

2.05 JOINT PACKING

Shall be installed in all joints to receive sealant. Material shall be a resilient type such as closed cell PVC foam or as recommended by the manufacturer. Oakum or other types of absorptive materials shall not be used as packing material.

2.06 OTHER MATERIALS

A. For masking around joints, provide masking tape complying with Fed. Spec. UU-T-106c.

B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Concrete and ceramic tile surfaces:

1. Install only on surfaces that are dry, sound, and well brushed, wiping free from dust.
2. At open joints, remove dust by mechanically blown compressed air if so required.
3. Use solvent to remove oil and grease, wiping the surfaces with clean rags.
4. Where surfaces have been treated, remove the surface treatment by sandblasting or wire brushing.
5. Remove laitance and mortar from joint cavities.
6. Where backstop is required, insert the approved backup material into the joint cavity to the depth needed.

B. Steel surfaces:

1. Steel surfaces in contact with sealant:
   a. Sandblast as required to achieve acceptable surface for bonding.
   b. If sandblasting is not practical, or would damage adjacent finish, scrape the metal or wire brush to remove mill scale.
   c. Use solvent to remove oil and grease, wiping the surfaces with clean rags.
2. Remove protective coatings on steel by sandblasting or by using a solvent that leaves no residue.

C. Aluminum surfaces:

1. Remove temporary protective coatings, dirt, oil, and grease.
2. When masking tape is used for protective cover, remove the tape just prior to applying the sealant.
3. Use only such solvents to remove protective coatings as are recommended for that

purpose by the manufacturer of the aluminum work, and which are non-staining.

3.03 INSTALLATION OF BACKUP MATERIAL

A. Use only the backup material recommended by the manufacturer of the sealant used, and accepted by the Architect for the particular installation, compressing the backup material 25% to 50% to achieve a positive and secure fit.

B. When using backup of tub or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.

C. Interior and exterior joints where no backing has been provided or which is in excess of 3/4" deep shall be packed by this subcontractor with fiberglass or a suitable joint filler to reduce the depth to 1/2" maximum. Maximum movement: the width of the joint shall be at least four times its maximum movement.

3.04 PRIMING

A. Use only the primer recommended by the manufacturer of the sealant, and accepted by the Architect for the particular installation, applying in strict accordance with the manufacturer's recommendations as accepted by the Architect.

B. The priming of joints shall be by brush to reach all surfaces to which compound will be applied. Primer shall be provided on masonry, concrete and wood surfaces as recommended by sealant manufacturer. Primer shall not be applied to surfaces that will be exposed after caulking is completed.

3.05 BOND-BREAKER INSTALLATION

Provide an approved bond-breaker where recommended by the manufacturer of the sealant, and where directed by the Architect, adhering strictly to the installation recommendations as accepted by the Architect.

3.06 INSTALLATION OF SEALANTS

A. Prior to start of installation in each joint, verify the joint type according to details on the Drawings, or as otherwise directed by the Architect, and verify that the required proportion of width of joint to depth of joint has been secured.

B. Equipment:

1. Apply sealant under pressure with power-actuated or hand gun, or by other appropriate means.

2. Use guns with nozzle of proper size, and providing sufficient pressure to completely fill the joints as designed.

C. Thoroughly and complete mask joints where the appearance of sealant on adjacent surfaces would be objectionable.

D. Install the sealant in strict accordance with the manufacturer's recommendations as accepted by the Architect, thoroughly filling joints to the recommended depth.

E. Tool joints to the profile shown on the Drawings, or as otherwise required if such profiles are not shown on the Drawings.

F. Cleaning up:

1. Remove masking tape immediately after joints have been tooled.

2. Clean adjacent surfaces free from sealant as the installation progresses, using solvent or cleaning agent recommended by the manufacturer of the sealant used.

3. The excess material shall be cleaned from the surfaces adjacent to the joint,

following the caulking operation and the top of the compound deposit shall be left with a smooth even finish. No material is permitted on the exposed face of aluminum sections.

***** END OF SECTION *****

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SECTION 08100

METAL DOORS AND FRAMES

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 DESCRIPTION

Work included: Provide metal doors and metal door frames which are not specifically described in other Sections of these Specifications, where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. All the requirements of the Contract Documents apply to this Section.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Unless specifically otherwise accepted by the Architect, provide all products of this Section from a single manufacturer.

C. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with:

1. SDI Grade II for Heavy Duty metal doors (Steel Door Institute).
2. HMMA Standard CHM-1-74 (Hollow Metal Manufacturers Association).

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items that will be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.
4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

PART 2 -- PRODUCTS

2.01 MATERIALS

Doors and Frames shall be made of commercial quality, level cold rolled steel conforming to ASTM A-366, Latest Edition, and free of scale, pitting, or other surface defects. Face sheets and frames of exterior doors shall be zinc coated.

2.02 METAL DOORS

A. Type and design: Provide full-flush polystyrene insulated design, in dimensions and types shown on the Drawings, labeled or non-labeled as indicated on the Door Schedule in the Drawings, in 16 gage for interior doors and 16 gage for exterior doors, properly reinforced. SDI-111A shall be used as the standard for all frame details.

B. Finish: Pre-clean and shop prime each door with rust inhibitive primer for finish painting which will be performed at the job site under Section 09900 of these Specifications. Cleaning shall include a phosphate treatment for paint adhesion and all exposed surfaces shall have a rust inhibiting primer.

C. Acceptable products:

1. Steel Craft Type L Series typically. Type B where security door called out on Drawings, gage of door to be increased to 14.

2. Republic, DB Series typically. Security doors called out on plans to be increased to 14-gauge.

3. Equal products of other manufacturers when accepted in advance by the Architect.

D. Clearances: Provide single swing doors with not more than 1/8" clearance at jambs and heads, not more than ¼" clearance at meeting edges of pairs of doors (1/8" on fire doors) and not more than ¾" clearance at the bottom. Provide door bottom per hardware specifications. All clearance dimensions are nominal and subject to a tolerance of + 1/32". Lock edges of the door shall be designed to provide proper operating clearance conforming to dimensions noted above.

2.03 METAL FRAMES

A. Type and design: Provide frames of the types and dimensions shown on the Drawings, labeled or non-labeled as indicated on the Schedule and Types in the Drawings, in 16 gage for interior and exterior frames, properly reinforced. SDI-111A shall be used as the standard for all frame details.

B. Finish: Pre-clean and shop prime each door with rust inhibitive primer for finish painting which will be performed at the job site under Section 09900 of these Specifications. Cleaning shall include a phosphate treatment for paint adhesion and all exposed surfaces shall have a rust inhibiting primer.

C. Acceptable manufacturers: See Paragraph 2.02-C above.

D. Welded Frames. Secure headers and jambs at the corners either by internal welding of faces or by welded splice plates. Also secure joints at jambs and headers at the rabbet either by tack welding on the inside of the profile or by mechanical interlock. Form neat line joints at faces of frames at junction of head and jamb.

E. Frame Anchors:

1. Wall Conditions. Provide frames with a minimum of three anchors per jamb as required for the adjoining wall construction. Provide anchors of not less than 18 gage steel or 3/16" diameter wire adjustable.

2. Floor Anchors. Provide all frames with minimum 18 gage anchors for attachment to the floor.

2.04 DOOR LOUVERS

A. Fire-Rated Louver: Each fire-rated louver shall have the listing mark of Underwriter's Laboratories Inc. affixed to louver assembly.

All louvers in fire-rated doors shall be Model FLDL-UL, 16 gage cold rolled steel with stainless steel operating springs, as manufactured by Anemostat Products, Carson, California, or equal products of other manufacturers when accepted in advance by the Architect. Louvers shall be sight-proof per SDI-111C.

B. Fixed-Blade Louver

1. All fixed blade louvers shall be Model FDLS, 18 gage cold rolled steel with mitered and welded frames and countersunk mounting holes, as manufactured by Anemostat Products, or equal products of other manufacturers when accepted in advance by the Architect. Louvers shall be sight-proof per SDI-111C.

2. Provide insect screen where louver occurs in exterior door.

C. Finish

Finish shall be factory painted in color selected by the Architect.

2.05 FINISH HARDWARE

Secure templates from the finish hardware supplier, and accurately install, or make provision for, all finish hardware at the factory.

2.06 INSULATION

Provide polystyrene foam insulation core typically and at all 12" high horizontal mullions and sills. Insulation shall have a minimum R factor of 7.7.

2.07 GLAZING

Non-removable glazing stops shall occur on the outside of exterior doors and the secure side of interior doors. Glazing beads on the inside of glass and louver panels shall be removable. Miter of butt join beads at corners. Glazing beads may be either screw-on or snap-on type. Glazing systems shall be a minimum of 20-gage steel or .040" aluminum.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 FABRICATION

A. Doors:

1. All doors shall be of types and sizes on the drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Doors shall be strong, rigid and neat in appearance, free from warpage or buckle. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.

2. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.

3. Top and bottom edges shall be closed with a continuous recessed 16 gauge steel channel extending the full width and spot welded to both faces. Exterior doors shall have an additional flush closing channel at the top edge. Opening shall be provided in the bottom closer for escape of entrapped moisture.

4. Vertical edges of single acting swing doors shall be beveled 1/8" in 2".

5. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully template hardware only. Where surface mounted hardware is to be applied, doors shall have reinforcing plates only, with drilling and tapping to be done in the field. Minimum gauge of hardware reinforcing shall be as follows:

   a. Hinge: 7-gauge

   b. Lock, flush bolts, concealed holders, and for all surface-mounted hardware: 12-gauge.

6. Allow 1/8" clearance between doors and frame at top rail and at lock and hinge stiles. At floors allow 1/2" clearance. At thresholds and curbs allow 1/4" clearance unless otherwise detailed.

7. The Face sheets of Exterior and Security doors shall be stiffened by continuous vertical formed steel sections occupying the full thickness of the interior space between door faces. These stiffeners shall be not less than 20 gauge, spaced not more than 6" apart and securely attached to both face sheets by spot welds not more than 4" o.c. Spaces between stiffeners shall be sound deadened and insulated the full height of the door with an inorganic non-combustible batt-type material.

B. Frames:

1. All door and louver frames shall be strong and rigid, neat in appearance, square, true and free of defects, warp and buckle. Molded members shall be clean cut, straight and of uniform profile and back-bends shall be as detailed.

2. Corner joints shall have all contact edges closed tight, with trim faces and stops mitered and continuously welded. All welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.

3. Hardware reinforcement shall be same as specified for door, with hinge and pivot reinforcement 1-1/2" x 10" minimum size.

4. Unit frames for installation in stud partitions shall be provided with steel anchors of suitable design for welding to steel studs. Anchors shall be not less than 16-gauge and shall be securely welded inside each jamb. Anchors are to be spaced at 24" on center.

5. Provide floor anchor of 14-gauge steel securely welded inside each jamb with two holes provided for floor anchorage.

6. Dust cover boxes of not less than 26-gauge shall be provided at all hardware mortises on frames to be set in masonry or drywall partitions. All frames shall be provided with a steel spreader attached to the feet of both jambs to serve as a brace during shipping and handling.

C. Finish: Finish shall consist of the following items:

1. Thoroughly clean all metal of rust, oil, and grease after fabrication.

2. Bonderize all metal with bonderite solution.

3. Baked-on coat of primer after bonderizing.

4. Additional coat of primer prior to shipping.

D. Labeled Doors and Frames: Labeled doors and frames shall be provided for those openings requiring fire protection ratings, as scheduled on the drawings. Such doors and frames shall be constructed as tested by the Underwriter's Laboratories, Inc., and shall bear their label for the required rating. Provide additional frame accessories as required to maintain the fire protection ratings once the frames are installed in the openings.

3.03 FIELD MEASUREMENTS

Verify all opening dimensions in the field prior to fabrication and assembly of frames.

3.04 INSTALLATION

Placing frames:

1. Where practicable, place frames prior to construction of enclosing walls and ceilings.
2. Set frames accurately into position, plumbed, aligned and braced securely until permanent anchors are set.
3. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
4. At in-place wood stud construction, set frames and secure to adjacent construction with #12 self-tapping flathead wood screws and zee clips.
5. At in-place metal stud construction, set frames and weld anchorage devices to adjacent construction.
6. When installed in prepared openings in concrete construction, provide sealant between frame and concrete in accordance with provisions of Section 07900 of these Specifications.

3.05 ADJUST AND CLEAN

A. Final adjustments:

1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.
2. Leave work in complete and proper operating condition.
3. Remove defective work and replace with work complying with the specified requirements.

B. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touch-up of compatible air-drying primer.

***** END OF SECTION *****

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SECTION 08360

INSULATED ROLLING SERVICE DOORS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Insulated rolling service doors.

1.03 RELATED WORK

Related Work: Documents affecting work of this Section include, but are not necessarily limited to, Special Conditions, and Sections in Division 1 of these Specifications.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Comply with pertinent provisions of Section 5 of the General Conditions, and Sections in Division 1 of these Specifications.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items that will be provided.

2. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.

3. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

4. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 PRODUCT HANDLING

A. Comply with pertinent provisions of General Conditions.

B. Lift doors and carry them into position. Do not drag doors across one another.

1.07 Warranty

All Cookson Rolling Insulated Service Doors shall be warranted for a period of 2 years from the time of shipment against defects in workmanship and materials.

PART 2 -- PRODUCTS

2.01 CHAIN OPERATED INSULATED ROLLING SERVICE DOOR

All Rolling Insulated Service Doors shall be as manufactured by The Cookson Company, Phoenix, Arizona. Furnished materials shall include all curtains, bottom bars, guides, brackets, hoods, operating mechanisms and any special features.

2.02 QUALITY ASSURANCE

A. Exterior rolling insulated service doors shall be designed to withstand at least a twenty (20) pounds per square foot wind load. Wind locks shall be installed on doors over 14'1" wide.

B. All rolling insulated service doors shall be designed to a standard maximum use of 25 cycles per day and an overall maximum of 50,000 operating cycles for the life of the door.

2.03 MATERIALS

A. The door curtain shall be constructed of interconnected strip steel slats conforming to ASTM A-653. The slats shall be designated by The Cookson Company as Number 45 (measuring 3" high by 7/8" deep) consisting of a 22 gauge, exterior slat and a 22 gauge, interior slat separated by 13/16" of rigid insulation.

B. The finish on the door curtain shall be Cookson Color Cote consisting of the following:

1. Hot dipped galvanized G-90 coating consistent with ASTM A-653

2. Bonderized coating for prime coat adhesion

3. Factory applied Thermosetting Powder Coating applied with a minimum thickness of 2 mils. The color shall be selected by the architect and shall be chosen from custom color selection.

C. The bottom bar shall consist of two 1/8" angles mechanically joined together with a 1" diameter vinyl covered foam edge astragal continuous along the bottom. The finish on the bottom bar shall be the Cookson Color Cote finish as indicated in the curtain section.

D. The guides shall consist of 3 steel angles bolted together with 3/8" fasteners to form a channel for the curtain to travel. Extruded vinyl snap-on weather-stripping shall be furnished continuously along the exterior leg of each guide. The wall angle portion shall be continuous and fastened to the surrounding structure with either minimum 1/2" fasteners or welds, both on 36" centers. The finish on the guide angles shall be the Cookson Color Cote finish as indicated in the curtain section.

E. The brackets shall be constructed of steel not less than 1/4" thick and shall be bolted to the wall angle with minimum 1/2" fasteners. The finish on the brackets shall be the Cookson Color Cote finish as indicated in the curtain section.

F. All gears shall be cast iron with teeth cast from machine cut patterns. The pinion gear shall not be less than a 3" pitch diameter. The gear ratio shall be designed for a maximum effort of not more than 30 pounds.

G. The barrel shall be steel tubing of not less than 6" in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the width of the curtain. The barrel shall be designed to limit the maximum deflection to .03" per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.

H. The hood shall be fabricated from 24 gauge, galvanized steel and shall be formed to fit the curvature of the brackets. The hood shall contain a waterproof baffle to control air infiltration. The finish on the hood shall be the Cookson Color Cote finish as indicated in the curtain section.

2.04 OPERATION

Chain operated doors shall open and close with a maximum of 30 pounds of effort utilizing an endless chain and cast iron reduction gears.

2.05 LOCKING MECHANISMS

The chain door shall be secured by means of a chain lock.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

An authorized Cookson distributor shall install all Cookson Rolling Insulated Service doors.

3.03 ADJUSTING AND CLEANING

A. Test rolling doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.

B. Touch-up damaged coatings and finishes and repair any damage. Clean all exposed surfaces as recommended by manufacturer.

***** END OF SECTION *****

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SECTION 08620

UNIT SKYLIGHTS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Work included: Provide Skylights and counter flashing system where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.03 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 SUBSTITUTIONS

Substitution will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit Manufacturer's data, catalog cuts, configurations, locations, fastening methods, installation details, dimensioned drawings, and other data needed to prove compliance with the specified requirements and to enable proper preparation of the roof opening.

B. Include characteristics of light admitted, transparency.

PART 2 -- PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. O'Keefe's (800) 227-3305

B. South Coast Skylights (800) 440-9999

C. Tri-Star (714) 430-5300

D. Bristolite (800) 854-8618

E. Others: submit for Architect approval prior to submission of Bid.

2.02 MATERIALS

Type(s), Size(s), and Glazing: as indicated on Drawings.

2.03 ACCESSORIES

A. Anchorage Devices: Type recommended by manufacturer.

B. Sealant: As specified in Section 07900.

2.04 FABRICATION

A. Fabricate free of visual distortion and defects.

B. Provide for removal of condensation.

C. Provide weathertight assembly.

D. Fabricate to drain water entering joints, or migrating moisture occurring within unit, to exterior.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Check openings for correct size and irregularities.

C. Correct conditions detrimental to timely and proper completion of the Work.

D. Do not proceed until unsatisfactory conditions have been corrected.

E. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Coordinate with installation of roofing system, wood curb and related flashings. Provide weathertight installation.

C. Apply bituminous paint on aluminum surfaces of units in contact with cementitious materials or dissimilar metals.

***** END OF SECTION *****

SECTION 08625

TUBULAR DAYLIGHTING DEVICE

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SECTION INCLUDES

A. Tubular daylighting device, consisting of roof dome, reflective tube, and diffuser assembly; configuration as indicated on the drawings.

B. Accessories.

1.03 RELATED SECTIONS

C. Section 07311 - Asphalt Shingles: Flashing of skylight base.

D. Section 07320 - Roof Tiles: Flashing of skylight base.

E. Section 07510 - Built-Up Bituminous Roofing: Flashing of skylight base.

F. Section 07530 - Electrometric Membrane Roofing: Flashing of skylight base.

G. Section 07550 - Modified Bituminous Membrane Roofing: Flashing of skylight base.

H. Section 07600 - Flashing: Metal flashings.

I. Section 08620 - Unit Skylights: Skylights without reflective tube.

J. Section 08630 - Metal Framed Skylights.

K. Section 15810 - Ducts: Fan vent duct and connections.

L. Section 16150 - Equipment Wiring: Electrical connections.

M. Section 16500 - Lighting Equipment and Controls: Light bulbs and lamps.

1.04 REFERENCES

N. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008a.

O. ASTM A 463/A 463M - Standard Specification for Steel Sheet, Aluminum Coated, by the Hot Dip Process; 2006.

P. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized), by the Hot Dip Process; 2007.

Q. ASTM E 283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.

R. ASTM E 308 - Standard Practice for Computing the Colors of Objects by Using the CIE System; 2006.

S. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors; 2002.

T. ASTM E 547 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain walls by Cyclic Air Pressure Difference; 2000.

U. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position; 2006.

V. ASTM D-1929 - Test Method for Ignition Properties of Plastics; 1996 (2001).

W. UL 181 - Factory Made Air Ducts and Air Connectors

X. UL 790 - Standard for Tests for Fire Resistance of Roof Covering Materials; 2004.

Y. ICBO/ICC AC-16 - Acceptance Criteria for Plastic Skylights; 2008.

1.05 PERFORMANCE REQUIREMENTS

Z. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:

1. Air Infiltration Test: Air infiltration will not exceed 0.30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
2. Water Resistance Test: No uncontrolled water leakage at 10.5 psf pressure differential with water rate of 5 gallons/hour/sf when tested in accordance with ASTM E 547.
3. Uniform Load Test:
   a. No breakage, permanent damage to fasteners, hardware parts, or damage to make system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 150 psf (7.18 kPa) or Negative Load of 60 psf (2.87 kPa) in accordance with ICBO/ICC AC-16 Section A, or Negative Load of 70 psf (3.35 kPA) if tested per ICBO/ICC AC-16 Section B.
   b. All units shall be tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.
4. Fire Testing:
   a. When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the 2006 International Building Code.
   b. Self-Ignition Temperature - Greater than 650 degrees F Per: U.B.C. Standard 26-6. See ASTM D-1929.
   c. Smoke Density - Rating no greater than 450 Per U.B.C. 8-1 (See ASTM Standard E 84) in way intended for use. Classification C.
   d. Rate of Burn and/or Extent - Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2: U.B.C. Standard 26-7. See ASTM D 635.
   e. Rate of Burn and/or Extent - Maximum Burn Extent: 1 inch (25 mm) Classification CC-1: U.B.C. Standard 26-7. See ASTM D 635.

1.06 SUBMITTALS

AA. Per article 5 of the General Conditions

BB. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

CC. Shop Drawings. Submit shop drawings showing layout, profiles and product components, including anchorage, flashings and accessories.

DD. Verification Samples: As requested by Architect.

EE. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.

FF. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of Daylight Credits available for the products specified.
2. Data on Energy Optimization Performance Credits for the products specified.
3. Data on Regional Credits which may me available for the project location. (LEED 2.1)
4. Data on Perimeter and Non-Perimeter Controllability of Systems for use of Daylight Dimmer option with the products specified.
5. Data on potential Innovation in Design Credits which may be available for the innovative use of the products specified.

1.07 QUALITY ASSURANCE

GG. Manufacturer Qualifications: Engaged in manufacture of tubular daylighting devices for minimum 15 years.

1.08 DELIVERY, STORAGE, AND HANDLING

HH. Store products in manufacturer's unopened packaging until ready for installation.

II. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.09 PROJECT CONDITIONS

JJ. 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 absolute limits.

1.10 WARRANTY

KK. Daylighting Device: Manufacturer's standard warranty for 10 years.

LL. Electrical Parts: Manufacturer's standard warranty for 5 years, unless otherwise indicated.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Solatube International, Inc., which is located at: 2210 Oak Ridge Way ; Vista, CA 92081; Toll Free Tel: 888-765-2882; Tel: 760-477-1120; Email: request info (commsales@solatube.com); Web: www.solatube.com

B. Substitutions will be considered per Article 5.3 of the General Conditions.

2.2 TUBULAR DAYLIGHTING DEVICES

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

B. Brighten Up Series: Solatube Model 160 DS, 10 Inch (250 mm) Daylighting System.
1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
a. Outer Dome Glazing: Type DA, 0.125 inch (3 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting, impact modified acrylic blend.
b. Optional Shock Inner Dome Glazing: Type DI, 0.115 inch (2.9 mm) minimum thickness high impact injection molded acrylic required for high velocity wind zones.
c. Raybender 3000: Variable prism optic molded into outer dome to capture low angle sunlight and limit high angle sunlight.

d. LightTracker Reflector: Aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in dome to capture low angle sunlight.

2. Flashing Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
   a. Base Material: Sheet steel, corrosion resistant, meeting ASTM A 653/A 653M or ASTM A 463/A 463M, 0.028 inch (0.7 mm) thick.
   b. Base Flat: Flat Type FF4, no pitch 4 inches (102 mm) high.
   c. Base Flat: Flat Type FF6, no pitch 6 inches (152 mm) high.
   d. Base Pitched: Pitched Type FPM, 22.5 degrees slope from horizontal, 4 inches (102 mm) high.
   e. Tile Roof No Pitch: No Pitch Type FFT, 4 inches (102 mm) high. . Tile Roof Counter-Flashing: corrugated aluminum 1100-0, 0.020 inch (.508 mm).
   f. Tile Roof Pitched: Pitched Type FPT, 22.5 degrees slope from horizontal, 4 inches (102 mm) high. . Tile Roof Counter-Flashing: corrugated aluminum 1100-0, 0.020 inch (.508 mm).
   g. Flashing Insulator: Type FI. Thermal isolation material for use under flashing.
   h. Metal Roof Flashing Kit: Type MR. Includes Butyl tape, flashing screws, speed nuts, corner washers and polyurethane sealant.
   i. Dome Edge Protection Band: Type PB, For fire rated roofs. Aluminized steel. Nominal thickness of 0.028 inches (0.7 mm).
3. Roof Flashing Turret Extensions: Provide manufacturer's standard extensions for applications requiring:
   a. Type T02: Additional lengths of 2 inches (50 mm) extension.
   b. Type T04: Additional lengths of 4 inches (100 mm) extension.
   c. Type T012: Additional lengths of 12 inches (300 mm) extension.
   d. Type T024: Additional lengths of 24 inches (600 mm) extension.
   e. Type T036: Additional lengths of 36 inches (900 mm) extension.
   f. Type T048: Additional lengths of 48 inches (1200 mm) extension.
4. Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact acrylic; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.
5. Reflective Extension Tube: Aluminum sheet, thickness 0.015 inch (0.4 mm).
   a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
   b. Color: a* and b* (defined by CIE L*a*b* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E 308.
   c. Tube Diameter: Approximately 10 inches (250 mm).
6. Reflective 30 degree Adjustable tube: Aluminum sheet, thickness .015 inch (0.4 mm)
   a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
7. Reflective 90 degree Adjustable tube: Aluminum sheet, thickness .018 inch (0.5 mm)
   a. Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface Visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum (400 nm to 2500 nm) less than 93 percent.
   b. Extension Tube Angle Adapter: Provide manufacturer's standard adaptors for applications requiring:
      1) Type A1 one 0 to 90 degree extension tube angle adapter.
      2) Type A2 two 0 to 90 degree extension tube angle adapters.
8. Ceiling Ring: Injection molded, impact resistant acrylic. Nominal thickness is 0.110 inches.
9. Dual Glazed Diffuser Assembly:
   a. Upper glazing: Acrylic plastic classified as CC2 material. The nominal thickness is 0.040 inches (1.020 mm).
   b. Lower glazing (Optiview Fresnel Lens): Molded polycarbonate plastic classified as CC1 material. The nominal thickness is 0.022 inches (0.61 mm).
   c. Lower glazing (Vusion): Acrylic plastic classified as CC2 material. The nominal

thickness is 0.090 inches (2.29 mm).

d. Diffuser Trim Ring: Injection molded acrylic.
   1) White Trim (Optiview Fresnel Lens): Type L1.
   2) White Trim (Vusion): Type L4.
   3) Stainless-tone Trim (Optiview Fresnel Lens): Type L5.
   4) Stainless-tone Trim (Vusion): Type L6.
   5) Frosted Shade (Optiview Fresnel Lens): Type L7.
   6) Frosted Shade (Vusion): Type L8.

e. Effect Lens: Acrylic plastic classified as CC2 material. The nominal thickness is 0.090 inches (2.29 mm).
   1) Warm Effect Lens: Type WL.
   2) Softening Effect Lens: Type SL.
   3) Warm Softening Effect Lens: Type WSL.

10. Accessories:

a. Lighting Fixture for 160 DS Model: Bracket mounted inside system just above diffuser; UL listed.
   1) Incandescent: Type INC, for one 100 W incandescent lamp, ceramic screw-in lamp holder, medium base, one lamp.
   2) Fluorescent: Type CFL, dedicated compact fluorescent fixture, for one 26 W, 4-pin lamp.
   3) Electrical Requirements: 110 V, 15 amp GFCI circuit for damp and wet conditions.

b. Local Dimmer Control: Provided with dimmer switch and cable.
   1) Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; Maximum current draw of 50 ma per unit; controlled by low voltage, series Type T02: circuited, 4 conductor, 22 gauge cable; providing daylight output between 2 and 100 percent.
   2) Switch: Type SW, Manufacturer-specific low voltage DC DP/DT switch (white) required to operate Daylight Dimmer. Note: A maximum of 10 units can be connected to one switch.
   3) Cable: Type CA, Two conductor, 22 gauge, low voltage cable (500 ft.) for multiple unit DC connections.

c. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required,

d. Exhaust Fan: Type VEN, permanently lubricated in-line fan motor, 110 cfm (52 L/s) capacity.
   1) Exhaust Duct: Flexible, Class 1, in accordance with UL 181. Provide as specified in Section 15810.
   2) Air Intake trim: Injection molded impact resistance acrylic with trim to fit installation conditions.
   3) Exhaust Vent Cap: Low-profile roof cap Type RV.
   4) Electrical Requirements: 115 V; install fan on same switch as internal light fixture.
   5) Electrical Requirements: 115 V; wall switch.

2.3 ACCESSORIES

A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.

B. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.

C. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's printed instructions.

B. After installation of first unit, field test to determine adequacy of installation. Conduct water test in presence of Owner, Architect, or Contractor, or their designated representative. Correct if needed before proceeding with installation of subsequent units.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08800

GLAZING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

All of the requirements of the Contract Documents apply to this Section.

1.03 REFERENCES

A. SIGMA No. 64-7-2 -- Specification for Sealed Insulating Glass Units.

B. FGMA -- Glazing Manual, Glazing Sealing Systems Manual.

1.04 QUALITY ASSURANCE

Conform to Flat Glass Marketing Association (FGMA) for glazing installation methods.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.06 SUBMITTALS

A. Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

B. Provide data on glazing sealant. Identify colors available.

C. Submit two samples, illustrating glass unit and coloration.

1.07 GUARANTEE

A. Contractor shall guarantee the work covered by this specification against all defects in material and workmanship for a period of not less than two (2) years.

B. Include coverage of sealed glass units from seal failure, interpane dusting or misting, and replacement.

PART 2 -- PRODUCTS

2.01 ACCEPTABLE GLASS MANUFACTURERS

A. Insulated, Laminated, and Spandrel Glass: PPG Industries, Inc.

B. Security Glazing: Nippon Electric Glass Company (800) 426-0279.

C. Clear Fire-Rated Window Glazing: Pyrobel by Interedge (877) 376-3343.

D. Clear Fire-Rated Door/Sidelight Glazing: PyroEdge or Pyrobel by Interedge (877) 376-3343.

2.02 GLASS MATERIALS (As indicated on the Window Schedule):

A. General: Exposed "tong" marks are not acceptable.

B. Interior Tempered Glass: Clear, Tempered ¼" thick. Grade B (tempered), Style I (uncoated), Type I (float or plate).

C. Insulated Glass Units: Double pane ¼" units with edge seal; interpane ½" space purged with dry hermetic air; total unit thickness of 1 inch. Tempered as required by Code and indicated on drawings. Tinting as indicated on Window Schedule - tinted on inside of outer layer only. PPG Solarban 60 (2) or (3) or equal low e coating. Performance values based on tinted product selected.

D. Interior Wired Glass: 1/4" clear wire glass.

E. Interior laminated glazing - one way: Two pieces of 1/8" clear float glass, tempered as required by code, laminated with .030 in. polyvinyl butyl plastic interlayer conforming to 16CFR 1201 Category II for one-way glazing.

F. Security Glazing: 11/16" thick, glazing assembly consisting of two outer lights of 1/8" clear chemically strengthened glass with a core of two 1/8" polycarbonate sheets laminated with four inter-layers of .50 inch thick urethane.

G. Ballistic Glazing:

15/16" thick glazing assembly certified for level-A ballistics consisting of two outer lights of 1/8" clear chemically strengthened glass with a core of two 1/8" and 1/4" polycarbonate sheets laminated with four inter-layers of .50-inch thick urethane.

H. Clear Fire Glazing: Model as required for required Fire-Rated Assembly.

2.03 GLAZING COMPOUNDS

A. Glazing Compound: Modified oil type, non-hardening, knife grade consistency.

B. Butyl Sealant: Single component; Shore-A hardness of 10-20; black color; non-skinning.

C. Acrylic Sealant: Single component, solvent curing, cured Shore hardness, non-bleeding.

D. Silicone Sealant: Single component, non-bleeding, non-staining; Capable of water immersion without loss of properties.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene; 80-90 Shore A durometer hardness; 4 inch minimum long x 1/4 inch thick.

B. Spacer Shims: Neoprene; 40-50 Shore A durometer hardness; 4 inch long on 18 inch centers for wet-glazed systems.

C. Glazing Clips: Manufacturer's standard type.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the area and conditions under which work of this Section will be performed.

B. Coordinate work with other trades as needed to assure that proper substrate are provided to receive work of this Section.

C. Verify surfaces of glazing channels or recesses are clean, square in plane, free of obstructions, and ready for work of this Section.

D. Verify weep holes in exterior frame are provided.

E. Correct conditions detrimental to timely and proper completion of the Work.

F. Do not proceed until unsatisfactory conditions are corrected.

G. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses.

3.03 EXTERIOR WET METHOD (SEALANT AND SEALANT)

A. Place setting blocks at 1/4 points and install glass pane.

B. Install removable stops with pane centered in space by inserting spacer shims both sides at 18-inch intervals, 1/4 inch below sightline.

C. Fill gap between pane and stops with sealant to depth equal to bite of frame on pane, but not more than 3/8 inch below sightline.

D. Apply sealant to uniform line, flush with sightline. Tool or wipe sealant surface with solvent for smooth appearance. Security Glazing to be sealed with security sealant as recommended by manufacturer.

E. Drain or weep the sill of each opening to the outdoors at three points using 3/8-inch diameter weep holes or the equivalent.

3.04 INTERIOR COMBINATION METHOD (TAPE AND SEALANT)

A. Cut glazing tape to length and install against permanent stops, project 1/16 inch above sightline.

B. Place setting blocks at 1/4 points.

C. Rest glass on setting blocks and push against tape to ensure full contact at perimeter of pane.

D. Install: removable stops, spacer shims between glass, and applied stops at 18-inch intervals 1/4 inch below sightline.

E. Fill gap between pane and applied stop with sealant to depth equal to bite of frame on pane to uniform and level line.

F. Trim protruding tape edge.

3.05 INTERIOR WET METHOD (COMPOUND AND COMPOUND)

A. Install glass resting on setting blocks. Install applied stop and center pane by use of spacer shims at 18-inch centers, kept 1/4 inch below sightline.

B. Locate and secure glass pane using glaziers' clips.

C. Fill gaps between pane and stops with glazing compound until flush with sightline.

3.06 CLEANING

A. After installation, mark pane with an "X" by using plastic tape or removable paste.

B. Remove glazing materials from finish surfaces.

C. Remove labels after work is completed.

D. Clean glass with solvent and normal wash. Final cleaning and polishing shall be done prior to final inspection.

E. Remove and replace broken, scratched, chipped or otherwise defective glass with new materials and leave the entire installation in a neat, clean, and acceptable condition.

***** END OF SECTION *****

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SECTION 09200

LATH AND PLASTER

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Supply and install all Lath and Plaster Work as shown on the Drawings and as specified herein, for a complete and proper installation.

1.03 REFERENCE STANDARDS

Comply with all applicable requirements of the California Lathing and Plastering Contractor's Association "Reference Specifications" except where more stringent requirements are indicated herein or in local building codes.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Submit Product Data and color samples and manufacturers application data.

B. Make (2) samples, at least one-foot square, of selected specified plaster system.

1.06 QUALITY ASSURANCE

A. In all Work under this Section, coordinate with all other trades whose work connects with, is affected or concealed by lathing and plastering. Before proceeding, make certain all required inspections have been made. Do all cutting and patching required to accommodate the work of other trades.

B. Inspect surfaces to receive lath and plaster before starting Work and do not start until surfaces are acceptable. Starting Work under this Section implies acceptance of surfaces.

1.07 DELIVERY AND STORAGE

Deliver all manufactured materials in original packages bearing manufacturer's name and brand. Use only one brand of each material throughout job. Store materials in dry areas.

PART 2 -- PRODUCTS

2.01 LATH

Paperbacked Lath: K-Lath Corporation: "Aqua K-Lath", or as approved by Architect, 16 gauge wires spaced 1-1/2 inches o.c. vertically and welded to 16 gauge wires spaced 2 inches o.c. horizontally, with perforated Kraft paper to insure plaster embedment and Type I Class B waterproof building paper laminated to back side.

2.02 ACCESSORIES

A. Corner Bead: #1X Type, Keene or equal, expanded metal flanges integral with nose bead of solid metal, galvanized.

B. Corner Lath: As specified for expanded metal, three (3) inch legs bent to a 105-degree corner, - "Cornemaster #30" by Keene, or equal.

C. Casing Beads: #66 Type, Western, or equal, expanded metal flange, galvanized, depth as required by plaster thickness, weighing approximately 200# per 1000 lineal feet for 3/4-inch and 7/8-inch types.

D. Expansion Joints: #15 by Keene or equal. Cut lath passing under expansion joints. Install where indicated on Drawings, with the following minimum conditions:

1. No length should be greater than 18 feet in either direction
2. No panel shall exceed a maximum of 144 square-feet for vertical applications.
3. No panel shall exceed a maximum of 100 square-feet for horizontal, curved or angular sections.
4. No length-to-width ratio should exceed 2.5 to 1 in any given panel.

E. Bonding Agent: As recommended for application over smooth monolithic concrete shells. Concrete shells shall be cleaned with bonding agent applied prior to plastering interior.

F. Wire: Soft, annealed, galvanized steel, 8-gauge for hangers, 16-gauge for channel ties and 18-gauge for lath ties.

G. Nails: Concrete nails, case hardened steel, 3/4 inch long.

H. Weep Screed: by Keene or equal. 1-1/4" ground, galvanized.

I. Building Paper: 15#, asphalt impregnated.

J. Miscellaneous Items: Furnish all miscellaneous components not specified herein but shown on the Drawings and any other items required to complete the installation.

K. Water: Clean and free of deleterious matter.

2.03 PORTLAND CEMENT PLASTER

A. Portland Cement: Conforming to ASTM C-150, Type 1.

B. Sand for Cement Plaster: Conforming to ASA A42.2.

C. Hydrated Lime: Conforming to ASTM C-206, Type S.

D. Quick Lime: Conforming to ASTM C-5.

E. Exterior Cement Plaster:

1. Scratch Coat: One part Portland Cement, four (4) parts sand and hydrated lime equal to 25% volume of cement.
2. Brown Coat: One part Portland Cement, five parts sand and hydrated lime equal to 25% of the volume of cement.
3. Finish Coat: Portland Cement-Lime: one part standard Portland Cement, not more than 1/2 part dry hydrated lime (or an equivalent amount of lime putty) and not more than one part #20 mesh, and one part #16 mesh silica sand. Submit finish sample(s) for Architect's approval.
4. Thickness: 7/8 inch thick, measured from back of lath.
5. Finish coat to contain integral color. Submit samples to Architect for approval based upon colors indicated on Drawings.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and condition under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 GENERAL

A. Coordinate work with other trades as needed to assure that proper substrate are provided to receive work of this Section.

B. Provide ventilation to properly dry plaster during and subsequent to application. In glazed areas, accomplish by keeping windows open sufficiently to provide air circulation; in enclosed areas lacing normal ventilation, mechanically remove moisture-laden air.

3.03 LATHING

A. Apply lath with long dimension at right angles to supports; lap side and ends as recommended by manufacturer. Stagger vertical laps. Make no vertical joints at any corner; bend lath around all corners, internal and external.

B. Attach lath to studs by fasteners at spacings required by local building codes. All attachments to be corrosion resistant.

C. Install all accessories to plumb, true and level lines, and backing plates as located by the trade furnishing these items.

D. Install beads, corner laths, control joints, reglets, screeds, and like items, using single lengths wherever possible. Provide corner beads at all exterior corners shown, mitering or coping as required, and fastening at six (6) inches o.c., both sides. Provide casing beads wherever interior plaster angles are shown and wherever one or both abutting surfaces are metal lathed, except corner laths are not required where metal lath is continuous around corner at junctions of walls, or where ceiling lath turns down a wall. Tie outer edges only to adjoining lath at six (6) inches o.c. or stub nail to any concrete. Install access panels supplied by other trades.

E. Start installation at bottom of wall, working up and from right to left. Apply lath with long dimension at right angles to supports; lap sides and ends as recommended by manufacturer. Stagger vertical laps. Make no vertical joints at any corner; bend lath around all corners, internal and external.

F. Attach lath to metal and/or wood studs by means of tie wire and nails respectively at spacings as required by Local Building Codes. All attachments shall be corrosion resistant.

G. Install corner beads at all external corners. Use single length except where standard length is not sufficient. Miter or cope as required; fasten with tie wire at six (6) inches o.c., both sides.

H. Install at interior angles and sheer one or both abutting surfaces are metal lath. Corner laths are not required where metal lath is continued around corner at junction of walls and where ceiling lath turns down wall unless otherwise noted on drawings. The outer edges only to adjoining lath at six (6) inches o.c., or stub nail to concrete.

3.04 PLASTERING

A. Do not apply plaster below 55 degrees F temperature. Apply no plaster to frosty surfaces. Dampen any surfaces on which suction must be reduced with fog-spray. Maintain all screeds plumb and true.

B. Except when had mixing small batches is approved, use approved mechanical mixers. Clean mixers, mixing boxes and tools after mixing each batch. Thoroughly mix with water until uniform in color and consistency. Retempering not permitted. Discard

plaster, which has begun to stiffen. Mix in strict accordance with manufacturer's printed directions.

C. Except in the case of specifically formulated plasters, which require only water added job site, proportion by volume as specified.

D. Scratch coat: Apply with sufficient material and pressure to shove material through metal lath and form a good key; 3/8 inch minimum thickness, score in horizontal direction with metal scorer with clipped teeth to provide good mechanical key for second coat. Dampen concrete and concrete block surfaces to reduce suction prior to application.

E. Brown coat: Apply not sooner than 48 hours after application of scratch coat; properly dampen scratch coat; apply sufficient pressure to force plaster into scratches and build out to within 1/8 inch to screeds; for, float and darby to true, plumb surfaces and corners; leave rough for finish coat.

F. Curing: Keep Brown coat moist for at least 48 hours; commence moistening as soon as plaster has hardened sufficiently so to prevent injury; apply water in a fine fog spray; avoid soaking; curing shall proceed over holidays, Saturdays and Sundays if necessary. If atmospheric conditions are hot and dry, curing time shall be extended as necessary at no additional cost to Owner. Allow plaster base coats to cure for a minimum of fourteen (14) days before applying finish coat.

G. Finish coats Apply to partially dry base coat, or to a thoroughly dry base coat that has been evenly wetted by brushing or spraying; avoid use of excessive water. Trowel all finish surfaces of plaster to perfectly true and even surface without scratches, ridges, voids, cracks, etc. Fill fissures or breaks in brown coat and existing plaster before application of finish coat. Make coats uniform in thickness with average thickness about 1/8 inch; minimum thickness anywhere: 1/16 inch.

3.05 CLEANING AND PATCHING

A. A clean floor of droppings immediately after each coat is applied. At any exterior locations, remove droppings or splashes from all concrete, masonry or other finish surfaces.

B. Patch after all other Work, except painting, has been completed. Cut out damaged or broken plaster to straight lines with clean, sharp edges. Cut out cracks to width of at least one (1) inch. Fill areas to be patched with base materials, and then give a finish coat of same material as adjoining plaster. Patched areas shall match adjoining work in finish and texture. Joining shall be flush and smooth so joints between patch and existing plaster are not noticeable.

C. At completion of Work, remove excess plaster from beads, screeds, etc., and leave Work clean and ready for painting. Promptly remove plaster, rubbish, surplus material, scaffolding and other equipment from job site. Leave areas broom clean.

***** END OF SECTION *****

SECTION 09250

GYPSUM BOARD SYSTEMS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

All of the requirements of the Contract Documents apply to this Section.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

A. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. List of items to be provided under this Section.
2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

B. Mock-ups:

1. At an area on the site where accepted by the Architect, provide mock-up panels as follows:
   a. Make each mock-up panel approximately 4'-0" high and 4'-0" long.
   b. Provide one mock-up panel for each variation of panels.
   c. The mock-up panels may be part of the Work, and may be incorporated into the finished Work, when so accepted in advance by the Architect.
2. If the mock-up panels are not permitted to be part of the finished Work, completely demolish and remove them from the job site upon completion and acceptance of the other work of this Section.

1.05 DELIVERY AND STORAGE

Deliver all manufactured materials in original packages bearing manufacturer's name and brand. Use only one brand of each material throughout job. Store materials off ground and cover against weather. Remove any damaged materials from the site.

1.06 QUALITY ASSURANCE

A. Comply with all applicable requirements of "American Standard Specifications for the Application and Finishing of Gypsum Wallboard", by the America Standards Association, except where more stringent requirements are called for herein, in local Codes or by manufacturer of wallboard. Do all cutting and patching required to accommodate work of other trades.

B. Maintain temperature of drywalled spaces in range of 55 to 90 degrees F until building is entirely closed and ventilated to eliminate excessive moisture.

C. All work herein requires coordination with trades who's Work connects with, is affected or concealed by drywall. Before proceeding with drywall Work, make certain all required inspections have been made.

D. Inspect surfaces to receive drywall before starting Work and do not start until surfaces are acceptable. Starting Work under this Section implies acceptance of surfaces.

PART 2 -- PRODUCTS

2.01 WALLBOARD MATERIALS

A. Gypsum Board: Conforming to ASTM C-36: 5/8" thick, maximum permissible length, ends square cut, tapered and beveled edges.

B. Fire resistive gypsum board: Type X at all interior conditions: 5/8 inch thick x 4 feet wide. Use moisture resistant type X where used in interior wet conditions (ASTM C79).

C. Moisture-resistant Gypsum Board, conform to ASTM C630, 5/8" thick, maximum permissible length.

D. Exterior Cement Board: Concrete glass-fiber reinforced, ½" thick prefabricated panel, consisting of aggregate and Portland cement reinforced with vinyl coated woven glass fiber mesh embedded in both surfaces. Durock Tile Backer Board by USG or approved equal.

2.02 WALLBOARD ACCESSORIES

A. Trim and Edging: 26 gauge, electro-galvanized steel, with knurled surfaces for bedding cement. Provide angle corner pieces with 1-1/4 inch legs at all external corners and channel type metal trim pieces as detailed at all gypsum board edges meeting dissimilar materials. 136#/1000 l.f.

B. Screws: KW self-tapping sheet metal screws, blued steel, counter sunk Phillips heads, of lengths as required to accommodate thickness of drywall construction, for metal framing attachments.

C. Expansion joints: Conspec Systems, Inc. model FWF and FWFC as applicable in field locations. Extruded clear aluminum with continuous gasket.

D. Adhesive: Manufacturer's recommended adhesive for drywall/masonry condition.

2.03 FINISHES

A. Typical walls and/or ceilings to be painted are to receive a medium stipple (orange peel) textured finish as approved by the Architect. Texture to be applied mechanically by this subcontractor.

B. Sand textured walls shall have white play or plaster sand added into the mud prior to application. The application shall be troweled to simulate a smooth plaster finish.

C. A sample of 4' x 4' is to be prepared of each texture for the Architect's approval prior to application.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. If framing members are out to alignment, bowed or warped, correct to make true surfaces before application of gypsum board. Make finish walls or ceilings plumb and level without ridges, bows or warps.

B. Apply boards with long dimension perpendicular to framing members with all abutting ends and edges over supports. Neatly fit and stagger all end joints. Make joints occur on different studs at opposite sides of partition. Cut and fit neatly around all outlets and switches. Space fasteners 8 inches o.c. along vertical edges, and 12 inches o.c. of midpoints, 3/8 inch from edge of board. Fasten boards to backings specified (unless noted as shear walls).

C. Erection technique shall result in plumb and straight surfaces with no waves or buckles, free of unevenness at joints.

D. Joints wider than 1/8 inch will be cause for rejection of board surface by Architect.

E. Provide all backing, furring, stripping, or blocking indicated or required for installation and attachment of Work of all other trades. Cut and frame all openings required by other trades. Structural members shall not be cut, notched or drilled except as shown or noted on Drawings.

3.03 TAPING AND FINISHING

A. Mix joint and finishing compounds per manufacturer's directions.

B. Center tape over joint and embed in uniform layer of joint compound of sufficient width and depth to provide firm and complete bond. Apply skim coat while embedding tape.

C. Treat angles with reinforcing tape folded to conform to adjacent surfaces and straight true angles.

D. Allow compound to thoroughly dry for at least 24 hours.

E. Over joint compound and tape, apply coat of finishing compound. Spread evenly and feather out beyond edge of board. After first finishing coat is thoroughly dry (at least 24 hours), cover with second coat with edges feathered out slightly beyond preceding coat.

F. Give all dimples at fastener heads and all marred spots on surface of board one coat joint compound and two coats finishing compound, applied as each coat is applied to joints.

G. Install metal corner reinforcement at all external corners. Conceal flanges of metal reinforcement with at least two coats compound. When completed, compound shall extend approximately 8 inches to 10 inches on each side of metal nosing.

H. After each application of joint or finishing compound has dried, lightly sand all joints. Leave all board and treated areas uniformly smooth and ready for texturing and painting.

3.04 SCHEDULE

A. Provide fire-rated gypsum board at all firewalls and shafts as indicated on Drawings and required by code.

B. Provide water resistant gypsum board at all bermed walls, plumbing walls - full height, and walls to receive tile finish.

3.05 CLEAN UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust and to prevent tracking gypsum and joint finishing compound onto floor surfaces.

B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris and surplus material of the Section.

***** END OF SECTION *****

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SECTION 09510

ACOUSTICAL CEILING SYSTEMS

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Supply and install all Acoustical Ceiling Work as shown on Drawings and as specified herein. All the requirements of the Contract Documents apply to this Section.

1.03 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.04 SUBMITTALS

A. Submit complete layout of all systems including attachments, intersections of members and edge conditions.

B. Samples: submit 2 samples of each type of unit specified herein.

1.05 QUALITY ASSURANCE

A. Have applicators approved by manufacturer of material or system being installed.

B. Work hereunder requires coordination with trades who's Work connects with, is affected, or concealed by acoustical units. Before proceeding with Work, make certain all required inspections have been made.

C. Examine sub-surfaces to receive Work. Commencement of Work will be construed as acceptance of all sub-surfaces.

D. Comply with all applicable requirements of Acoustical Materials Association, Bulletin "Architectural Acoustical Materials".

1.06 DELIVERY AND STORAGE

Deliver all manufactured materials in original containers bearing manufacturer's name and brand. Use only one brand for each type of unit throughout job. Store materials within building in locations directed.

PART 2 -- PRODUCTS

2.01 GRID

A. Ceiling Suspension Materials: Comply with ASTM C635, as applicable to the type of suspension system required for the type of ceiling units indicated. Coordinate with other work supported by or penetrating through the ceilings.

B. Manufacturer, Type, Location, and Pattern: as indicated on the drawings.

C. Edge Mouldings: Manufacturer's standard channel moulding for edges and penetrations of ceiling, with a single flange of moulding exposed, white baked enamel finish, unless otherwise indicated.

2.02 ACOUSTICAL TILE

Manufacturer, Type, Location, and Pattern: as indicated on the drawings.

2.03 EXTRA STOCK

Order additional 3% of each type of acoustical unit specified, for maintenance use, at no additional cost to Owner. (One box minimum.)

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

A. Provide all materials and accessories for complete installation per Drawings and manufacturer's printed instructions and recommendations.

B. Install units to sub-surfaces from setout points and to pattern shown on Drawings. Verify location of Work of other trades so their items occur within a whole unit or at joints as shown.

C. Install units in place fitting snugly. Provide spacers or hold-down clips where shown or required.

D. After installation, clean any soiled surfaces. Replace any damaged units at no additional cost to the Owner.

E. Arrange acoustical units in the manner shown by reflected ceiling plans. Consult with Architect pertaining to any adjustments.

3.03 SUPPORT SYSTEMS FOR SUSPENDED CEILING

A. General: Ceilings shall not support material or building components other than grills, insulation batts or light fixtures. Duct work, plumbing and like work shall have its own support system and shall not use the ceiling system or suspension wires.

B. Vertical Support System: Suspension wires shall be a minimum of 12-gauge galvanized wire attached to the main runner at 4 ft. maximum spacing in both directions. Each wire shall be anchored to the structure above with a device capable of supporting a minimum of 75 pounds. Wires supporting fixtures shall be capable of supporting four times the fixture weight. Suspension wires shall not hang more than 1 in 6 out of plumb unless counter sloping wires are provided. Wires shall not attach to or bond around interfering material such as ductwork. Trapeze or equivalent devices shall be used where obstructions interfere with direct suspension.

C. Horizontal Support System: The lateral support system for ceilings shall be shown in detail shop Drawings. Provisions shall be made for possible deferential movement between ceilings and sidewalls. Terminal ends of each main and each cross runner shall be wire supported; wall trim angles shall not provide primary support for runners. Lateral support of ceilings shall not be provided by the angle trim and runner shall not be riveted to wall trim.

D. Light Fixture Support: All recessed or drop-in light fixtures shall be supported directly from the fixture housing to the structure above with a minimum of two 12 gauge wires; leveling

and positioning of fixture may be provided by the ceiling grid. Fixture support wires may be slightly loose to allow fixture to seat in heavy-duty grid system only.

E. Secure wire hangers by looping and wire tying either directly to structures or to inserts, eye-screws or other devices which are secure and appropriate for the substrate, and which will not deteriorate or fail with age or elevated temperatures.

3.04 CLEANING AND PROTECTION

A. Clean exposed surfaces of acoustical ceilings, including trim, edge mouldings and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

B. The installer shall advise the Contractor of required protection for the acoustical ceilings, including temperature and humidity limitations and dust control, so that the Work will be without damage and deterioration at the time of acceptance by the Owner.

***** END OF SECTION *****

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SECTION 09650

RESILIENT FLOORING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

Furnish all materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to comply with the Contract Documents, including, but not limited to these major items:

1. Resilient tile flooring.
2. Floor substrate surface.
3. Rubber base.

1.03 REGULATORY REQUIREMENTS

Conform to applicable code for flame rating requirements of 75 or less in accordance with ASTM E84.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Provide product data on specified products, describing physical and performance characteristics.

B. Submit two samples, illustrating color and pattern for each floor material or base, substituted for those indicated in the Drawings.

C. Submit manufacturer's installation instructions. When approved by the Architect, will become the basis for accepting or rejecting actual installation procedure used on the Work.

1.06 OPERATION AND MAINTENANCE DATA

Submit cleaning and maintenance data maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

1.08 EXTRA MATERIALS

Provide 5% of each pattern and color of flooring and of base specified.

PART 2 -- PRODUCTS

2.01 VINYL COMPOSITION TILE

Manufacturer(s), Type(s), Location(s), Color(s), and Pattern(s) as indicated on drawings.

2.02 SHEET VINYL

Manufacturer(s), Type(s), Location(s), Color(s), and Pattern(s) as indicated on drawings.

2.03 BASE MATERIALS

Manufacturer(s), Type(s), Location(s), Color(s), and Pattern(s) as indicated on drawings.

2.04 ACCESSORIES

A. Subfloor Filler: Latex cement underlayment as recommended by flooring material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Sealer and Wax: Types recommended by flooring manufacturer.

D. Welding rod: Use same manufacturer as flooring manufacturer and install per manufacturer's instructions. Colors to be selected from standard colors. All flooring in medical procedure rooms and in restrooms shall be heat welded.

E. Provide other materials, not specifically described but required for a complete and proper installation as selected by the Contractor subject to the approval of the Architect.

2.05 FLOORING TRANSITIONS

Manufacturer(s), Type(s), Location(s), Finishes(s), as indicated on drawings.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft. and are ready to receive work.

E. Verify concrete floors are dry to the maximum moisture content of 2.5% (two and one half percent); and exhibit negative alkalinity, carbonization, or dusting. Provide test results to indicate that the substrate meets moisture requirements prior to starting work. Higher moisture content will be as accepted by manufacturer in their written warranty.

F. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.

B. Apply, trowel, and float filler to leave smooth, flat, hard surface.

C. Prohibit traffic from area until filler is cured.

D. Vacuum clean substrate.

E. Maintain the temperature of the space to receive the flooring and the materials to be installed at a minimum of 65 degrees F and maximum of 100 degrees F for at least 48 hours prior to, during, and 48 hours after installation. Maintain a minimum temperature of

55 degrees F thereafter.

F. Install flooring after all other trades, including painting, have been completed.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, conventional full-spread system.

B. Spread only enough adhesive to permit installation of materials before initial set.

C. Set flooring in place; press with heavy roller to attain full adhesion.

D. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

E. Install edge strips at unprotected or exposed edges, and where flooring terminates.

F. Scribe flooring to walls, columns, permanent cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION -- BASE MATERIAL

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, "V" cut back of base strip to 2/3 of thickness and fold.

C. Install base on solid backing. Bond tight to wall and floor surfaces.

D. Scribe and fit to doorframes and other interruptions.

3.05 PROTECTION

Prohibit traffic on floor finish for 48 hours after installation.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean, seal, and wax floor and base surfaces in accordance with manufacturer's instructions.

***** END OF SECTION *****

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SECTION 09660

FLUID-APPLIED FLOORING

PART 1 -- GENERAL

1.01 SUMMARY

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 WORK INCLUDED

A. Trowel-applied, direct bonded, elastomeric resin with graded aggregates for floor and base. System shall incorporate an elastomeric fiberglass reinforced waterproof membrane.

B. Perimeter edging for edge of deck and joint between plaster walls and decking cove base. Coordinate with other trades for correct installation.

1.03 QUALIFICATIONS

A. Applicator: Company specializing in resinous matrix flooring applications.

B. Supervisor; Trained by product manufacturer.

1.04 REGULATORY REQUIREMENTS

Conform to applicable code for flooring flame/fuel/smoke ratings in accordance with UL listings.

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

A. Submit product data and samples under pertinent provisions of Article 5 of the General Conditions.

B. Submit product data for divider strips and perimeter edging.

C. Submit two samples illustrating color and variation.

D. Submit manufacturer's installation instructions. When approved by the Architect, these will become the basis for accepting or rejecting actual installation procedures.

1.06 OPERATION AND MAINTENANCE DATA

Submit cleaning and maintenance data under provisions of Sections 01710 and 01730. Include procedures for stain removal, repairing surface, and cleaning.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 01640. All materials must be shipped to the job in unopened bags and containers.

B. Store materials in a dry, secure area. Maintain minimum temperature of 50 deg. F.

C. Keep products away from open flame.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not install flooring when temperature is below 50 degrees F except with written acceptance from manufacturer.

B. Maintain this temperature, 24 hours before, during and 72 hours after installation of flooring.

C. Ventilate area where flooring is being installed. Post and enforce NO SMOKING or OPEN FLAME signs until flooring has cured.

D. Provide uniform lighting of 25 fc measured at area of installation.

E. Restrict traffic from area where flooring is being installed or is curing.

1.09 WARRANTY

A. Provide one-year warranty under provisions of Section 01700.

B. Warrant: Include coverage against flooring delamination from substrate and degradation of surface finish. All products found not to conform to specifications within one year of completion of project shall be replaced at no extra cost to the Owner.

1.10 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

Selby: Promdek Exterior deck system with Selby waterproof elastomeric membrane. Distributed by Harris Specialty Chemicals, Inc. (904) 996-6228.

2.02 MATERIALS

A. Waterproof membrane: modified neoprene, elastomeric resin system reinforced with fiberglass.

1. Weight: 0.25 lbs. per square foot – 3/32" thick.
2. Tensile strength: ASTM D0751 – 43 psi.
3. Water Absorption: ASTM D-570 – nil.
4. Electrical resistivity: NFPA Bulletin 99 – nonconductive.
5. Elongation: ASTM D-751 – 535%.
6. Moisture Vapor Permeability: ASTM-1653 – nil.

B. Top Coat: elastomeric resin with graded aggregates - colored, skid-resistant.

1. Weight: 2.5 lbs/square foot – ¼" thick.
2. Compressive strength: ASTM C-579 – 1,550 psi.
3. Tensile strength: ASTM D-638.
4. Indentation: MIL-D-3134 – Initial 2.7%; After 24 hr. residual – 1.2%.
5. Impact resistance: MIL-D-3134 – 0.03" – no chipping, cracking or detachment.
6. Fire resistance: MIL-D- 3134 – U.L. – Class-A fireproof decking fire retardant.
7. Adhesive strength: MIL-D-3134 – 165 psi.
8. Water absorption: MIL-D-3134 – Nil.
9. Moisture Vapor Permeability: ASTM D-1653 – Nil.
10. Electrical resistivity: NFPA Bulletin #56A – non-conductive.
11. Abrasion resistance – 110 wear index.
12. Non-slip properties:
    a. Static Friction: dry- 1.03; water – 1.07; oily – 0.84.
    b. Sliding Friction: dry – 1.05; water – 1.07; oily – 0.84.

13. Color as selected from standard manufacturer colors.

2.03 ACCESSORIES

A. Divider Strips, end caps: With anchoring features as shown on drawings and required where adjacent to non-compatible surfaces.

B. Finish: divider strips and end caps to be aluminum with bronze anodized finish or equal as accepted by coating manufacturer.

C. Strip Height: To match flooring thickness.

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Verify that surfaces are ready to receive work, that subfloor surface is clean, dry, and free of substances which could affect bond.

E. Do not begin work until concrete substrate, where occurs, has cured 28 days, minimum, and measured moisture content is not greater than 16 percent.

F. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

A. Clean substrate surface free of foreign matter.

B. Do not install products over wet substrate or in rainy weather.

C. Apply primer coat per manufacturer's recommendations.

3.03 INSTALLATION – ACCESSORIES

A. Install strips straight and level as required.

B. Install base divider strips and seismic expansion joints as shown on the plans and required to allow for movement of substrate.

3.04 INSTALLATION – FLOORING

A. Install the waterproof elastomeric membrane reinforced with woven fiberglass in a direct bonded method approved by manufacturer. The cove base membrane should be brought over the top of the deck membrane where applicable.

B. Install exterior deck type grit coat and when dry sand lightly to remove trowel marks. Trowel apply one grout coat. Sand and vacuum to produce smooth surface.

C. Apply topcoat to ¼" minimum thickness in color and finish as selected through submittals.

3.05 MAINTENANCE

A. At the completion of installation, the applicator shall furnish three sets of the manufacturer's maintenance instructions.

B. Deck should be cleaned with a free rinsing detergent as often as necessary following recommended practices of the maintenance industry.

C. Protect the finish surface during construction to prevent damage from other trades until completion of project.

***** END OF SECTION *****

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SECTION 09670

EPOXY RESINOUS FLOORING

PART 1 -- GENERAL

1.01 RELATED DOCUMENTS

Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Section in Division 1 of these Specifications.

1.02 DESCRIPTION/SUMMARY

A. Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

B. Work Included the work includes, but is not limited to, providing all materials, labor, equipment and transportation to provide an epoxy resinous flooring system complete as indicated and as specified herein.

Surface preparation

Primer, base coat and cove base

C. Related Work Specified Elsewhere Note: Coordinate work of this section with work of other sections to properly execute the work and maintain satisfactory progress of work of other sections including:

CAST-IN-PLACE CONCRETE, Division 3

ROUGH CARPENTRY, Division 6

SEALANTS, Division 6

PLUMBING, Division 15

1.03 REFERENCES

References made herein to published specifications; standards, methods of testing and recommended methods of trade, industry and governmental organizations shall apply to the year of original adoption or the year of the latest revision or approvals.

Refer to Division 1, Section: REFERENCE STANDARDS.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 5.3 of the General Conditions.

1.05 SUBMITTALS

Submit samples, manufacturers literature and installation instructions per Division

1. Comply with pertinent provisions of Article 5 of the General Conditions.

1.06 QUALITY ASSURANCE

A. Applicator shall have minimum of five years experience in application of the specified type of flooring.

B. Provide certification from the manufacturer that the applicator is approved for installation of the flooring.

1.07 WARRANTY

Provide one (1) year guarantee for material and installation.

1.08 PRODUCT HANDLING AND DELIVERY

Deliver all material in manufacturers sealed containers and store under cover in a well-ventilated area.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Manufacturer: **Sunbelt Flooring, Inc.,**

Phone: (909) 628-1090 Fax: (909) 628-1280

Website: www.sunbeltflooirng.com

B. System: **The Sunbelt Flooring System** as installed **by Sunbelt Flooring, Inc.,** including: Preparation and installation on the "**Heavy-Duty Sunbelt Flooring No. 1100 Chemical Resistant Industrial Floor**" The General Contractor shall coordinate scheduling with adequate advance notice prior to floor installation as agreed upon with **Sunbelt Flooring, Inc**.

C. Products: Primer as recommended for conditions. Chemical Resistant Industrial Flooring No. 1100 (Color to be selected by Architect from the **Sunbelt Flooring, Inc**., sample boards as submitted) and installed only by **Sunbelt Flooring, Inc.** System shall be solids, translucent quartz grains, coated, pigmented, inorganic ceramic film, grade #28.

D. Sunbelt 1100 Flooring System Physical Properties

TEST		PHYSICAL PROPERTIES	
Compressive Strength (Kpsi) **ASTM C579**		18.5	
Tensile Strength (psi) **ASTM C-307**		2000	
Flexural Strength (Kpsi) **ASTM C-580**	6.15		
Flexural Modulus of Elasticity (psi) **ASTM D-790**		2.2×10^5	
Hardness (Shore D) **ASTM D-2240**		86	
Bond Strength (psi) **ASTM D-454**		600	
Indentation (mil/Kpsi) **Mil D-3124F**		11	(No visible indentation)
Abrasion Resistance (mg/Kcyc) **ASTM C-501**	597.4		
Coefficient of Friction **ASTM D-2047**		>0.9	
Flammability			

ASTM D-635

Burning time (sec)		104	(Self extinguishing)	Extent
of burning (mm)	6.5			

Thermal Coefficient of
Linear Expansion (in/in °C)
ASTM E-831

25° to 65°C	2.6×10^5
65°C to 135°C	5.7×10^5
135°C to 220°C	2.3×10^5

TEST	PHYSICAL PROPERTIES
Water Absorption (%) **ASTM C-413**	.01%
Heat Resistance limit (°F) **ASTM N/A**	**DRY -** 250° Continuous / 275° Intermittent **WET -** 140° Continuous / 200° Intermittent
Impact Resistance / Indention **Mil D-3124**	5x10-4 in. (No visible indentation)
Weather Resistance Weather-O-Meter 200 Hr Exposure	No visible cracking or deterioration

Resistance to Elevated Temperatures
A sample of the flooring was warmed to 158 degrees. There was no discernable softening. After cooling sample showed no measurable slip or flow.

U.S.D.A	Approved

Fungus/Bacteria Resistance
Will not support growth of fungus or bacterial when subject to mildew and bacteria test specified in TT-P-34

Electrical Conductivity	Electrically non-conductive

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Correct conditions detrimental to timely and proper completion of the Work.

C. Do not proceed until unsatisfactory conditions are corrected.

D. Beginning of installation means acceptance of conditions.

3.02 PREPARATION OF EXISTING CONCRETE

Cleaning of interior concrete slabs: Vacuum shot blast ("Blastrac") all designated existing interior concrete floor slabs that are to receive new flooring materials or leveling underlayment coating. Vacuum shot blasting shall be with steel pellets 330-5 to 390-5 for optimum surface profile in order for all sealers or adhesives to penetrate and bond. Coordinate all vacuum shotblasting with

respective floor covering contractor. Dustless diamond cup grinding may be used in some instances in lieu of shot blasting.

3.03 PREPARATION AND INSPECTION

A. Insure structural substrate to receive flooring is designed to prevent random cracking and/or deflection. Provide adequate control and expansion joints. Finish shall be "light steel trowel finish."

B. Concrete to receive flooring shall be wet cured for a minimum of 28 days. Do not permit use of chemical surface curing agents that may interfere with adhesion.

C. Ensure substrate is sound, dry, and free of dust, dirt, paint, grease, oil or other foreign substances.

D. Substrates in contact with ground must have an effective vapor barrier to prevent potential problems resulting from hydrostatic or capillary moisture pressure.

E. Variations in substrate level should not exceed 1/8" in ten feet. Ensure deviations or deteriorated concrete is corrected prior to start of this work.

F. Advise other trades of finished, fixtures and fittings not to be installed until decking is cured, such as: Painting, floor supported equipment, caulking, plumbing fixtures, etc.

G. Dirt, dust, plaster, oil, grease, tar, paint or any substrate that might impair adhesion must be thoroughly removed with suitable cleaners.

H. All cracks, holes broken and crumbling areas must first be cut out, cleaned and repaired with sand filled Sunbelt 1100.

I. Moving of settling cracks shall be cut or routed out and filled with flexi-caulk or resilient caulk and reinforced with 20 by 20 fiberglass tape.

J. Building shall be encased with roof, walls, windows and doors prior to floor installation. Exceptions shall be agreed upon, in writing, by flooring installer and architect.

3.04 INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Mix Sunbelt Flooring No. 1100 industrial flooring liquids with manufacturers approved equipment.

B. Troweled apply Sunbelt 1100 self-priming epoxy for the first build coat.

C. Add clean, dry aggregates as recommended by manufacturer. Allow to dry.

D. Sand if needed to remove all laitance and vacuum clean.

E. Apply finish coat with trowels to a tight flat surface.

F. If a skid resistant surface is required by Architect or indicated on drawings, non-skid aggregates shall be broadcast onto surface of finish coat, then back rolled for sealing.

G. Allow to cure thoroughly before opening floor to normal use. Use of heating equipment or infrared lamps is suggested if the seal coat cannot be given more than twelve hours of curing time before normal use.

H. Protection: Supply barricades and precautions to allow traffic after and during start of installation, and for the cure period of the final coat.

Sunbelt Flooring 1100
Chemical Resistance Table
ASTM D – 1308-57

Test involved completely submerged a cured disk of Sunbelt 1100 in each of the following solutions. Maximum submersion time was 30 days. Most actual commercial applications are far less demanding, particularly where solvents and other evaporating materials are concerned.