

08110.1 DESCRIPTION

This section of the specifications covers the furnishing and installing of all doors, transoms, center panels, windows, and associated finished hardware. In general, details, door and window types and sizes are indicated on the Plans.

08110.1.1 RELATED WORK

Not used.

08110.1.2 SUBMITTALS

08110.1.2.1 SHOP DRAWINGS - Shop drawings shall be submitted to the Engineer for his approval. Shop drawings shall show all details of doors, frames, windows, and accessory items, including all details or proper anchorage to the adjacent wall construction in each case.

08110.1.2.2 DESCRIPTIVE LITERATURE - Descriptive literature which identifies the manufacturer, model numbers, materials of fabrication and sizes shall be provided in accordance with Section 01300 of these Specifications.

08110.1.2.3 MANUFACTURER'S LITERATURE - Any manufacturer's literature provided for maintaining and operating their doors and hardware shall be furnished to the Owner prior to the time of final acceptance for payment.

08110.1.2.4 STAINED SAMPLES - See 08110.2.2.4 below.

08110.1.3 DEFINITIONS

Not used.

08110.2 MATERIALS**08110.2.1 STEEL DOORS**

All steel doors indicated in the Door Schedule and their pressed steel frames shall be hollow steel doors as detailed on the Plans and specified herein.

Doors and frames shall be made of prime quality, cold-rolled, pickle annealed, stretcher leveled steel, free from scale, pitting, and surface defects.

Hollow metal doors shall be 1-3/4 inches thick flush type, constructed of 2 sheets of not less than 16-gauge steel sheets formed and welded for flush pan assembly, with internal 20-gauge vertical reinforcing channels spaced not over 8 inches on centers the full height of the door. Reinforcing channels shall be uniformly spot welded to mated pans. Continuous 18-gauge stiffener channels shall be welded to faceplates top and bottom of all doors. Filler channels shall be provided at the top of exterior doors and also at the bottom of doors with thresholds to provide flush closure. All interior void spaces shall be completely filled with not less than 3-pound density rock wool or polyurethane. There shall be no visible joints on the face of the doors.

Concealed sheet or bar steel reinforcing shall be provided for mortise type hardware. Reinforcing shall be not less than the following: 9-gauge for butts; 12-gauge for locksets; and 14-gauge for surface applied hardware. Reinforcing shall be drilled and tapped to template requirements. Concealed reinforcing shall be provided for closers.

08110.2.1.1 OPENINGS

Where indicated in the Door Schedules on the Plans, doors shall be provided with glazed openings. Moldings shall be integral with and welded into the door providing 2 recessed rebates at all openings. The top and bottom interior glazing stop shall be removable and shall be flush with face sheets of door. Doors with glazed openings shall be Overly door type, or approved equal.

08110.2.1.2 ASTRAGALS

Astragals shall be provided on the active leaf of all exterior double doors and shall be a 1-3/4 inches wide, 12-gauge steel strip extended the full height of the door.

08110.2.1.3 FRAMES

Frames for hollow metal doors shall be pressed steel as indicated on the Plans. Pressed steel frames shall be constructed of not less than 16-gauge steel and shall be of the shape indicated on the plans and as required to fit the various wall construction. Frames shall be of welded unit construction assembled and welded in the shop. Welding shall be to the hairline joint with all exposed beads ground smooth. Jamb rebates shall be provided for three gray rubber door silencers. Concealed forcing of the frames for mortise hardware shall be not less than the following: 3/16-inch for butts; 12-gauge for lock strike; 14-gauge for surface applied items; and 18-gauge plaster guards over mortised hardware reinforcement. Frames shall be mortised drilled, and tapped to template requirements. Lock reinforcing units shall be supplied by finish hardware supplier. Frames in concrete shall be held in place by grout poured in keyways provided at all heads and jambs. Anchors for doorframes in masonry shall be Overly No. 111, or approved equal.

After shop assembly, doors and frames shall be cleaned thoroughly, ground smooth, and all seams along the edges of the door shall be filled flush with mineral filler. All doors and frames shall be bonderized and given one shop coat of rust inhibitive primer.

Gray rubber mutes shall not be installed until after painting, and then installation shall be deferred until as late in the job as possible, to avoid loss or damage. Before installation of the rubber mutes, the space behind the holes which are to receive the mutes shall be thoroughly cleared of any mortar or other obstructions which might prevent the mutes snap-locking into place.

08110.2.2 WOOD WALK DOORS

08110.2.2.1 DOORS - Wood doors shall be furnished and installed where shown on the Plans and as specified herein. Doors shall be flush veneered, prefinished, with a clear thermoplastic film 3 mils thick, edges sealed, and individually carton packed. Doors shall be guaranteed by the manufacturer according to the N.W.M.S. Standard Door Guarantee.

08110.2.2.2 DOORFRAMES - Doorframes, except fire door, shall be extruded anodized aluminum as indicated on the Plans. Door frames and accessories shall be color anodized as indicated on the Drawings or required in these Specifications.

08110.2.2.3 FIRE-RATED WOOD DOOR - Door shall be 1-3/4-inch, "Label B", one-hour mineral core fire door as manufactured by Weyerhaeuser Company; Paine Lumber Co., Inc.; or approved equal. Face veneer shall be Rotary Select White Birch and the door shall bear the "Label B" Underwriter's Laboratory designation. The door shall be installed in a UL approved frame.

08110.2.2.4 SOLID CORE DOORS - Solid core doors shall be solid particleboard core as manufactured by Weyerhaeuser Company; Paine Lumber Company, Inc.; or approved equal. Face veneers and edges shall be stained. Stained samples shall be submitted to the Engineer for approval prior to staining of the actual door.

08110.2.2.5 HOLLOW CORE DOORS - Door face veneers and edges shall be Rotary White Birch, and shall be Paine Lumber Co. "Rezo Type", or approved equal.

08110.2.3 TRANSOMS AND CENTER REMOVABLE PANELS

Transoms shall be either glass or steel panel as indicated in the Door Schedule on the Plans. All transoms and center panels shall be easily removable with clips as indicated on the Plans. All center panels shall match the door in which the center panel is placed, in thickness, material, and finish unless otherwise noted in these Specifications or on the Plans.

Glass transoms shall have 1/4-inch tinted tempered plate glass and shall be shop glazed in 6063T5 extruded aluminum sashes.

Steel transoms shall match the door over which the transom is placed in thickness, material and finish. Each transom shall have a neoprene gasket between the steel back and the transom. The clip shall tighten the transom against the neoprene gasket.

08110.2.4 DOOR HARDWARE

Shall be as follows:

08110.2.4.1 PANIC BAR LATCH - All exterior doors shall be equipped with panic bar latching devices, Rim 80 Series by Sargent and Company, or approved equal.

08110.2.4.2 DOOR CLOSURES - Doors shall be equipped with Series 351 closures as manufactured by Sargent and Company, or approved equal. All closures shall have hold-open features.

08110.2.4.3 KNOB LATCH SET - Shall be as follows:

- Latch sets for exterior walk doors shall meet Fed. Spec. FFH-106a-161A. They shall be stainless steel unless specified otherwise on the door schedule. One latch set is required for each single door and one for the active-leaf on double doors on all exterior walk doors. Latch sets shall be locked/unlocked by key from the outside knob and pushbutton locked from the inside. Sargent 11 Line by Sargent Company, or approved equal.
- Latch sets for interior doors shall meet Fed. Spec. FFH-106a-161N. They shall have no locks. Knobs shall be Tulip type rasp.

08110.2.4.4 DEADLOCKING LATCH: Dead lock latches shall have a dead lock, double cylinder B252PD as manufactured by Schlage Locks, or approved equal where shown on the door schedule.

08110.2.4.5 KEYING: Locks shall be keyed in conjunction with the existing system. Keying shall be submitted and is subject to Engineer's approval.

08110.2.5 LOCKS

Shall be Series 11 Line by Sargent with L stainless steel levers, or approved equal. Five keys shall be provided for each lock set.

08110.2.6 HINGES

Shall be full mortise, five knuckle, with non-removable hinge pins. Each door shall be fitted with three hinges.

08110.2.7 THRESHOLDS

Shall be extruded aluminum, No. 171A, by Pemko, or approved equal.

08110.2.8 DOOR GASKETING

Shall be vinyl bubble, held in place with aluminum molding around the perimeter of the door.

08110.2.9 DOOR BOTTON PROTECTION

All Doors shall be provided with an aluminum molding with a neoprene gasket, No. 315 AN, by Pemko or approved equal.

08110.3 CONSTRUCTION REQUIREMENTS**08110.3.1 MANUFACTURE AND SHIPPING**

All doors and doorframes shall be fabricated in a workmanlike manner. Hardware shall be installed by the door manufacturer. Hardware shall be installed so that the doors operate smoothly and with no binding

Doors shall be checked to assure that no damage has occurred during shipment to the Work site.

08110.3.2 INSTALLATION**08110.3.2.1**

DOORS AND FRAMES - All doors and doorframes shall be installed in a workmanlike manner. All doors and frames shall be adjusted so that operation will be smooth, free, easy and with no binding in the hardware between doors and frames. Doors shall be set plumb, square and level at their proper elevation and location. All hardware shall be adjusted to operate smoothly, freely and properly. Door holders shall be installed on the outside of doors such that they will not cross the threshold when the door is opened.

Doors and frames shall be reinforced for hinges, locksets, strikes, flush bolts, etc., as required. Doorknobs are to be 40 inches above the floor to the centerline of the knob.

Wood doors shall be installed in accordance with the National Woodworkers Manufacturing Standards. After fitting at job site, all four edges shall receive two coats of clear compatible lacquer.

08110.3.2.2

STEEL TO ALUMINUM CONTACT - Wherever there is a steel to aluminum contact, the two metals shall be separated by butadyne tape or equal.

08110.3.2.3

GASKETING - Gasketing shall be installed in accordance with the manufacturer's recommendations. Installation of gasketing should be delayed until painting of the door and frame has been completed.

08110.3.2.4

PAINTING - Painting of the doors and frames shall be in accordance with the requirements of Section 09910 of these Specifications. Care shall be taken to assure door hardware is not painted.

08110.4 METHOD OF MEASUREMENT

No separate measurement will be made for doors and frames.

08110.5 BASIS OF PAYMENT

Payment for doors and frames shall be included in the contract unit price for the building on which the doors are installed and accepted.

08210.1 DESCRIPTION

Includes furnishing and installing metal framed windows on buildings or enclosures as shown on the Drawings and in accordance with the requirements described herein.

08210.1.1 RELATED WORK

Not used.

08210.1.2 SUBMITTALS

The Contractor shall provide complete information which includes complete material description and manufacturer's installation instructions in accordance with the requirements of Section 01300.

08210.1.3 DEFINITIONS

Not used.

08210.2 MATERIALS**08210.2.1 FRAMES AND SASHES**

Frames shall be of heavy-duty, high quality aluminum with the finish shown on the Drawings or required in the Special Provisions. Frames shall be fabricated with the number of sliding sashes shown on the Drawings and fitted with latches to secure the window sashes in the closed position. Sliding sash openings shall be screened with standard bright aluminum screens which can be removed only from the inside. Window frames shall be specifically manufactured or fabricated for use with the materials forming the window opening (i.e. concrete, metal framing, wood framing, etc.). Window sashes for exterior windows shall be manufactured with double panes of glass to form an insulated window, and the window frames shall be fitted with non-metallic heat transmission barriers to minimize heat loss through the frame.

08210.2.2 GLAZING

Clear double strength glass shall be installed in the window sashes unless indicated otherwise on the Drawings. All exterior glazing shall be composed of 1 inch Thermopane with 3/16 inch tinted exterior glass, 5/8-inch air space, and 3/16-inch clear interior glass.

Any interior glass with sashes and frames shall be as shown on the Drawings or required in the Special Provisions of these Specifications.

08210.3 CONSTRUCTION REQUIREMENTS

08210.3.1 INSTALLATION - The Contractor shall install the windows in accordance with the manufacturer's instructions. Frames shall be securely fastened and sealed with exterior paintable silicone caulking. Installation of the windows shall be made so that operation of the sliding sashes is easy and without any obstruction.

08210.3.2 FINISH - Unless indicated otherwise on the Drawings, windowsills, inside and out, shall be finished and caulked to form a tight seal around the frame. Exterior sills shall be formed with concrete masonry which matches other adjacent building windows or as shown on the Drawings.

08210.4 METHOD OF MEASUREMENT

Separate measurement for Metal Windows will not be made when they are installed as a component of a building or structure listed in the Bid Schedule.

08210.5**BASIS OF PAYMENT**

Separate payment will not be made for window materials installed and accepted in a building or structure listed separately in the Bid Schedule.

09210.1 DESCRIPTION

It shall be the responsibility of the Contractor to coordinate with the Owner and/or the Engineer on the color of paint to be used on the referenced materials.

09210.2 MATERIALS**09210.2.1 CONCRETE AND MASONRY**

- A. The project building(s) shall be constructed as shown on the plans. Concrete work shall conform to the requirements of Division 3, and shall be Class A concrete. All work shall be neat and workmanlike. The surface of the entire structure, both interior and exterior, shall have any irregularities ground smooth. After being smoothed, the exterior surface of the structure shall be brushed with a mixture of 1/3 water, 1/3 cement, and 1/3 sand. The thickness of the brushed on mixture shall not exceed 1/8 inch.
- B. Exposed Concrete or masonry interior walls shall be sealed with a high quality concrete sealer and painted with one coat of white, high gloss enamel paint or other color as may be specified.
- C. Unless a different color is specified, the interior floor of the building shall be sealed with a gray industrial cement floor sealer.

09210.2.2 P-TRAPS

Drain piping shall be drain waste and vent (DWV) schedule 40 PVC pipe and fittings sized to fit the floor drain in accordance with the Drawings.

09210.2.3 OTHER SURFACES

- A. All plywood and other wood surfaces shall be painted with two coats of wood seal primer and one coat of white, high gloss enamel paint unless other colors are specified.
- B. All doors shall be painted with two coats of high gloss epoxy paint.
- C. All exposed pipe shall be painted with two coats of high gloss epoxy paint. Where required, the paint shall be color coded to indicate the nature of the material being transported in the pipe.
- D. All factory painted items should be approved by the Owner prior to delivery to coordinate color combinations.

09210.3 METHOD OF MEASUREMENT

09210.3.1 This work shall not be measured for separate payment, but shall be considered incidental to other items in the Bid Schedule.

09210.4 BASIS OF PAYMENT

09210.4.1 Complete compensation for the accepted work outlined in this Section shall be included in other bid items.

09500.1 DESCRIPTION

Work under this section of the Specifications shall include all labor, materials, equipment, and appliances required to furnish and install all lathing and stucco, as well as incidental and related items.

09500.1.1 RELATED WORK

Not used.

09500.1.2 SUBMITTALS

The Contractor shall submit finish coat color and texture samples to the Engineer/Owner for approval and selection.

09500.1.3 DEFINITIONS

Not used.

09500.2 MATERIALS

The materials used in the stucco shall be as follows:

09500.2.1 PORTLAND CEMENT

Portland Cement shall conform to ASTM C 150.

09500.2.2 LIME HYDRATE

Hydrated lime shall conform to Federal Specification No. SS-L-351.

09500.2.3 SAND

The sand used for scratch or brown coats shall be clean, free from organic matter and shall pass the soundness tests of ASTM C88. The loss in weight shall not exceed 10 percent for any sieve size.

SAND SEIVE SIZE

Sieve Size	Percent Passing
No. 89 Mesh	100
No. 14 Mesh	70 to 90
No. 28 Mesh	30 to 50
No. 48 Mesh	10 to 20
No. 100 Mesh	3

Not more than 3 percent of the sand by weight shall be allowed to pass the 100-mesh sieve. Sand shall be thoroughly dampened before using.

09500.2.4 REINFORCEMENT

Reinforcing shall be 3.4 galvanized wire mesh. Metal lath shall weigh not less than 3.4 pounds per square yard. Lath, furring and supporting material shall conform to ANSI A42.4.

09500.2.5 WATERPROOFING PAPER

Waterproofing paper shall be Morstop No. 2 or approved equal.

09500.2.6 WIRES, TIES, AND/OR STRING

Wire and ties shall be galvanized soft annealed No. 18 gauge.

09500.2.7 SCREENS

Screens shall be 26 gauge expanded wingtype, galvanized.

09500.2.8 CASING BEAD

Casing bead shall be Milcor" No. 66, 24 gauge zinc.

09500.2.9 CONTROL JOINT

Control Joint "Milcor" No. 15, 26 gauge zinc.

09500.2.10 FINISH COAT MATERIALS REQUIREMENTS

- Water proofing agent shall be a stearate compound, or approved equal.
- Colors and textures of finish coat shall be as per samples approved by the Engineer.
- Dry stucco mix shall be delivered to the job in the original package.
- Stucco waterproofed exterior float shall be as manufactured by California Stucco Products Company, San Francisco, California; Mission Stucco Company; or approved equal.

09500.3 CONSTRUCTION REQUIREMENTS**09500.3.1 INSTALLATION**

All finished work shall be complete and ready for use. All lathing and stuccoing shall be done in accordance with the room finish schedule with details as indicated on the Plans, and as specifically specified within these Specifications. Details of lathing and stuccoing not specifically covered in these Specifications shall be done in accordance with ANSI A42.2 and ANSI A42.3 for Portland cement stucco insofar as they apply to this project, and insofar as they are not in contradiction with the specific requirements of these Specifications.

09500.3.2 WATERPROOF PAPER AND WIRE MESH

Use metal lath with waterproof back behind. Install casing beads, where shown, and wherever plaster abutts or adjoints any other material and at all exposed termination points plaster. Control joints shall be provided in the plaster at a maximum spacing of 15 feet, or as details.

09500.3.3 MORTAR

All mortar shall be mixed in a power mixer for at least 5 minutes before applying. Use only enough clean water to produce a plastic mortar mix. Mortar for both the scratch coat and the browning coat shall be mixed in the following proportions:

MORTAR PROPORTIONS

Ingredient	Amount
Portland cement	1 volume
Hydrated lime	1/10 volume to each volume of cement
Sand	3-1/2 volumes (minimum)

09500.3.4 SCRATCH COAT

After all reinforcement is in place, a scratch coat should be applied. The scratch coat shall be applied so that the reinforcement is entirely embedded to 1/2 inch in thickness. The scratch coat shall be scored in opposite directions with a metal scratching tool having teeth set 1 inch apart. Scratch coat should be wet down for at least two days after application and then be permitted to dry before applying browning coat.

09500.3.5 BROWNING COAT

The scratch coat shall be dampened evenly before applying browning coat. Browning coat shall be applied to a minimum thickness of 3/8 inch and shall be rodded straight and true in all directions. This coat shall be applied to an entire elevation without laps or joinings. Overnight joinings shall be made at natural breaking points, such as rises, angles, and window ledges. Browning coat should be wet down for two days after application and shall be permitted to cure and dry for a minimum of seven days before applying finish coat.

09500.3.6 FINISH COAT

Finish coat shall be waterproofed exterior float. Use only sufficient clean water to produce a plastic mortar.

The browning coat shall be dampened evenly with water before applying the finish coat. The finish coat shall be applied to an entire elevation without showing laps or joinings. Overnight joinings shall be made at natural breaking points, such as rises, angles, or window ledges. This coat shall be a minimum 1/8-inch in thickness. The day after application, this coat shall be fog sprayed lightly, but not to saturation, and maintained in a damp condition for not less than two days or until cured.

09500.4 METHOD OF MEASUREMENT

This work shall be included with that of other items on the Bid Schedule and no separate measurement will be made.

09500.5 BASIS OF PAYMENT

Payment for this work shall be included with that of other items on the Bid Schedule and no separate payment will be made.

09910.1 DESCRIPTION

The Contractor shall furnish all labor, materials and equipment necessary to paint all designated components of buildings, piping and equipment in accordance with these Specifications.

09910.1.1 RELATED WORK

Not used.

09910.1.2 SUBMITTALS

09910.1.2.1 DESCRIPTIVE LITERATURE - Descriptive literature identifying manufacturer, type, content, application recommendations, and color samples, shall be provided in accordance with Section 01300 of these Specifications.

09910.1.2.2 DATA FOR PAINT APPROVAL - Complete data on each type and kind of paint and primer shall be submitted to the Engineer for approval. Approval shall be received from the Engineer before the paint is delivered to the jobsite. This procedure must be followed whether or not the paint that the Contractor proposes to use is named in the Specifications. Approval data shall show where and for what uses each paint product is proposed. Information submitted on each proposed type and kind of paint shall include data to show that the paint meets the detailed requirements of these Specifications.

09910.1.2.3 SAMPLES - The Contractor shall prepare and submit sample colors for all items which require color selection by the Engineer. No color selection will be made until all samples of all paints have been submitted. After all samples of all paints have been submitted, the Engineer will prepare a color scheme using the submitted colors. Colors will not necessarily be standard colors with all suppliers. The manufacturer shall mix colors, to secure the desired color when it is not one of his standard colors.

09910.1.2.4 SAND BLAST PANELS - The Contractor, at the beginning of the Project, shall furnish one square foot steel panels sandblasted in accordance with the sandblasting specifications and coated with non-yellowing shellac or clear non-yellowing plastic coating. Panels shall be used as the standards for preparation of steel surfaces for the duration of the project.

09910.1.2.5 PAINT REMNANT - At the end of the project, the Contractor shall turn over to the Engineer a gallon can of each type and color of paint, primer, thinner, or other coating used in the field painting. If the manufacturer packages the material concerned in gallon cans, then it shall be delivered in unopened labeled cans as it comes from the factory. If the manufacturer does not package the material in gallon cans, and in the case of special colors, the materials shall be delivered in new gallon containers, properly closed with typed labels indicating brand, type, color, etc. The manufacturers' literature describing the materials and giving directions for their use shall be furnished in three bound copies. A typewritten inventory list shall be furnished at the time of delivery.

09910.1.3 DEFINITIONS

Submerged Surfaces - In general, items shall be treated as submerged if they are to be at any time under water or are in structures which normally contain water. Unless specified otherwise, anything below the tops of the walls of such structures shall be considered as submerged.

09910.2 MATERIALS

09910.2.1 QUALITY CONTROL

This specification is not intended to be exclusive or limit competition, but rather to set forth the minimum standards for quality and performance. The Owner reserves the right to reject substitutions if in his opinion, the proposed substitutions will not achieve comparable equipment installation and performance standards.

09910.2.2 COLOR

The Engineer will make color selection from color samples provided by the Contractor.

09910.2.3 PAINT SELECTION

All paint and coating systems shall include high quality materials, resistant to temperatures up to 130°F, and sunlight exposure. Paints selected shall meet the manufacturer's recommendations and suitability standards for the specific application where it will be used.

09910.2.3.1 MINIMUM REQUIREMENTS - Minimum requirements for paint materials and their application shall be as shown in the tables below:

EXTERIOR PAINT APPLICATION TABLE

Application Substrata	No. of Coats	Paint Materials and Manufacture*	Coating Thickness (Mils Per Coat)
Wood Siding, Trim, Doors	1	A-100 Exterior Alkyd Wood Primer	2.3
	2	A-100 Exterior Latex Flat House & Trim by Sherwin Williams - OR -	1.3
	1	SUPRIME 8 Exterior	1.3
	2	Pro-Hide Plus Latex Satin House by Pratt & Lambert- OR -	1.3
	1	System 2H-4 Alkyd by Tnemec	2.5
	2	Tnemec 36-603 Undercoater 2H-Color Hi-Build Tnemec Gloss	2.5
Porous Masonry (Block)		System 52-2 Modified Epoxy Sand Texture Finish by Tnemec	
	1	52-Color Tnemec-Crete	60-80
	1	52-Color Tnemec-Crete	8-10
Concrete Walls, Above Grade	1	Loxon Ext. Masonry Acrylic Primer	3.1
	2	A-100 Exterior Latex Satin House & Trim by Sherwin Williams -OR -	1.3
	2	Pro-Hide Plus Latex Satin House by Pratt & Lambert - OR -	1.3
	2	System 6-1 Acrylic Latex Low Sheen by Tnemec 6-Color Tnemec-Cryl	2.5
Metal (Aluminum)	2	A-100 Exterior Latex Satin House & Trim by Sherwin Williams - OR -	1.3
	1	SUPRIME 3 Latex Metal Primer	1.3
	2	Pro-Hide Plus Latex Satin House by	1.3

Application Substrata	No. of Coats	Paint Materials and Manufacture*	Coating Thickness (Mils Per Coat)
	1	Pratt & Lambert – OR – DEFLEX 4020 Primer	3
	1	DEFLEX 4206 S/G Waterborne Acrylic Enamel by DeVoe	1.5
Metal, New Steel, (Mild Service)	1	Kem Kromik Universal Metal Primer	2.5
	2	Direct to Metal Enamel by Sherwin Williams - OR -	3.0
	1	SUPRIME 3 Latex Metal Primer	1.3
	2	Pro-Hide Plus Latex Satin House by Pratt & Lambert – OR –	1.3
	1	Devguard 4160 Primer followed by	2
	1	Devguard 4308 Alkyd Enamel or	2
	2	DEFLEX 4218 DTM Enamel by DeVoe	2
Metal, New Steel, (Severe Service)		System 66-2 Aliphatic Polyurethane by Tnemec	
	1	66-Color Hi-Build Epoxoline	4
	1	70-Color Endura-Shield	2
Metal, Galvanized Steel, (Mild Service)	1	Galvite HS	2.0
	2	A-100 Exterior Latex Satin House & Trim by Sherwin Williams -OR -	1.3
	1	SUPRIME 2 Latex Metal Primer	1.3
	2	Pro-Hide Plus Latex Satin House by Pratt & Lambert – OR –	1.3
	1	Devguard 4020 Primer	3
	2	DEFLEX 4206 S/G Waterborne Acrylic Enamel by DeVoe	1.5
Metal, Galvanized Steel, (Severe Service)		System 70-1 Aliphatic Polyurethane by Tnemec	
	1	66-Color Hi-Build Epoxoline	4
	1	70-Color Endura-Shield	2
PVC Pipe		System 66-23 Epoxy Polyamide by Tnemec	
	1	66-Color Hi-Build Epoxoline	4

INTERIOR PAINT APPLICATION TABLE

Application Substrata	No. of Coats	Paint Materials and Manufacturer*	Coating Thickness (Mils Per Coat)
Woodwork	1	ProMar 200 Alkyd Enamel Undercoater	1.9
	2	ProMar 200 Int Alkyd Semi-Gloss by Sherwin Williams-OR	1.7
	1	SUPRIME 11 Int Alkyd Wood Primer	1.5
	2	Pro-Hyde Plus Alkyd Satin by Pratt & Lambert – OR –	1.5
		System 2H-4 Alkyd by Tenemec	
	1	Tnemec 36-603 Undercoater	2.5
	2	2H-Color Hi-Build Tnemec Gloss	2

Application Substrata	No. of Coats	Paint Materials and Manufacturer*	Coating Thickness (Mils Per Coat)
Drywall	1	ProMar 200 Latex Wall Primer	2.5
	2	ProMar 200 Int Alkyd Semi-Gloss by Sherwin Williams - OR -	1.8
	1	SUPRIME 1 100% Acrylic MP Primer	1.1
	2	Pro-Hyde Plus Latex Satin by Pratt & Lambert - OR -	1.5
	2	System 6-1 Acrylic Latex Low Sheen by Tnemec 6-Color Tnemec-Cryl	2
Metal (Aluminum)	1	SUPRIME 9 Int/Ext Alkyd Metal Primer	1.1
	2	Pro-Hyde Plus Alkyd Satin by Pratt & Lambert - OR -	1.5
	1	DEFLEX 4020 Primer	3
	1	DEFLEX 4206 Semi-Gloss Waterborne Acrylic Enamel	1.5
Metal, New Steel, (Mild Service)	1	Kem Kromik Universal Metal Primer	2.5
	2	ProMar 200 Int Alkyd Semi-Gloss by Sherwin Williams - OR -	1.7
	1	SUPRIME 9 Int/Ext Alkyd Metal Primer	1.1
	2	Pro-Hyde Plus Alkyd Satin by Pratt & Lambert - OR -	1.5
	1	Devguard 4160 Primer followed by	2
	1	Devguard 4308 Alkyd Enamel or	2.5
Metal, New Steel, (Severe Service)	2	DEFLEX 4218 DTM Enamel by DeVoe	2
		System 66-2 Epoxy Polyamide by Tnemec	
	1	66-1211 Epoxoline Primer	3.5
	1	66-Color Hi-Build Epoxoline	4
Metal, Galvanized Steel, (Mild Service)	1	Galvite Paint	2.0
	2	ProMar 200 Int Alkyd Semi-Gloss by Sherwin Williams - OR -	1.8
	1	SUPRIME 9 Int/Ext Alkyd Metal Primer	1.1
	2	Pro-Hyde Plus Alkyd Satin by Pratt & Lambert - OR -	1.5
	1	Devguard 4020 Primer	3
	2	DEFLEX 4206 S/G Waterborne Acrylic Enamel by DeVoe	1.5
		System 66-2 Epoxy Polyamide by Tnemec	
Metal, Galvanized Steel, (Severe Service)	1	66-1211 Epoxoline Primer	3.5
	1	66-Color Hi-Build Epoxoline	4
PVC Pipe (Mild Service, Interior Only)	2	System 6-1 Acrylic Latex Low Sheen by Tnemec 6-Color Tnemec Cryl	2
PVC Pipe (Severe Service, Interior or Exterior)	1	System 66-23 Epoxy Polyamide by Tnemec 66-Color Hi-Build Epoxoline	4
Concrete Walls and	1	ProMar 200 Latex Wall Primer	1.1

Application Substrata	No. of Coats	Paint Materials and Manufacturer*	Coating Thickness (Mils Per Coat)
Ceilings (Mild Service)	2	ProMar 200 Int Alkyd Semi-Gloss by Sherwin Williams - OR -	1.3
	1	SUPRIME 4 Latex Wall Primer	1.2
	2	Pro-Hyde Plus Latex Satin by Pratt & Lambert	1.5
Concrete Walls and Ceilings (Severe Service)	2	System 66-4 Epoxy Polyamide by Tnemec 66-Color Hi-Build Epoxoline	4
Porous Masonry Walls (Mild Service)	1	Pre-Prime 167 by Devoe	1.5
	2	ProMar 200 Latex Wall Primer	1.1
	2	ProMar 200 Int Alkyd Semi-Gloss by Sherwin Williams - OR -	1.3
	1	SUPRIME 4 Latex Wall Primer	1.2
Porous Masonry Walls (Severe Service)	2	Pro-Hyde Plus Latex Satin by Pratt & Lambert	1.5
	1	System 66-15 Epoxy Polyamide by Tnemec 54-660 Masonry Filler	75-100
Concrete Floors (Mild Service)	2	66-Color Hi-Build Epoxoline	4
	1	Pre-Prime 167 by Devoe	1.5
	1	Concrete and Terrazzo Sealer (ANCO Cure and Hard by Intermountain Concrete Specialties.	None
	2	Industrial Enamel by Sherwin Williams - OR -	2
	2	With STAND Alkyd Floor Enamel by Pratt & Lambert - OR -	1
Concrete Floors (Severe or Mild Service)	2	Devguard 4328 Alkyd Enamel by DeVoe	2
	2	System 67-1 Epoxy Polyamide Semi-Gloss by Tnemec 67-Color Tneme Tread	2.5

*Brand names of materials have been used to indicate the types and quantities of materials required. Approved equals will be accepted.

09910.2.3.2 PAINT FOR WASTEWATER SYSTEMS - All paint for concrete and metal surfaces in wastewater systems shall be especially adapted for such use.

- Fume Resistance. All paint for final coats shall be fume resistant, compounded with pigments suitable for exposure to sewage gases, especially to hydrogen sulfide and to carbon dioxide. Pigments shall be materials, which do not tend to darken, discolor, or fade due to the action of sewage gases. If a paint manufacturer proposes use of paint which is not designated "fume resistant" in its literature, it shall furnish full information concerning the pigments used in this paint.
- Lead Paint. No lead paints shall be used.

09910.2.3.4 PAINT FOR POTABLE WATER SYSTEMS - All paint systems to be used in potable water service shall meet NSF requirements. See also Subsection 09910.2.3.5 below.

09910.2.3.5 PAINT FOR SUBMERGED SURACES

- Coal Tar Epoxy. Coal tar epoxy shall meet and conform with Government Specification Mil P-23236 with further qualification that the coal tar epoxy manufacturer and product must be listed on the current U.S. Navy Qualified Products List. Coal tar epoxy shall be subject to the Engineer's approval.
- Alternate Systems. Alternate coating systems for submerged service, such as Epoxy Polyamide Epoxoline by Tnemic, Epoxy Bar Rust 233H, by DeVoe, or equal, may be required for some applications, or may be approved in lieu of coal tar by the Engineer, upon request. Some colors of Epoxy Polyamide Epoxoline, or equal may be acceptable for use in potable water systems, however the manufacturer must be consulted for verification of acceptability prior to use in potable water applications.

09910.2.3.6 HIGH TEMPERATURE SURFACE TO 400°F - Paint for high temperature surfaces shall be DeVoe Hi-Heat Aluminum HT-4, Glidden 592 Metallite Aluminum, or Sherwin-Williams Silver-Brite Heat resisting aluminum paint B59 S1, or approved equal.

09910.2.4 CLEANING MATERIALS

Cleaning materials shall be best quality solvents, chemicals or detergents, which are commercially prepared for preparing painted surfaces and delivered to the site in sealed containers bearing an identifying label and the manufacturer's name.

09910.3 APPLICATION REQUIREMENTS

ALL paint and coating systems shall be applied in strict accordance with the manufacturer's published instructions for use.

09910.3.1 SURFACE PREPARATION

09910.3.1.1 CLEANING - All surfaces to be painted shall be clean and dry except that in some cases the paint manufacturer's directions may require wetting the surface before painting. Grease and oil shall be removed by wiping with mineral spirits or naphtha per Specification SP-1. Rust, scale, welding slag, and spatter shall be removed and the surface prepared by hand tool cleaning, power tool cleaning, or blast cleaning in accordance with the appropriate Specification SP-2 through SP-10.

09910.3.1.2 METAL SURFACES - Except as otherwise provided, all preparation of metal surfaces shall be in accordance with Specifications SP-1 through SP-10 of the Steel Structures Painting Council (SSPC). Sandblasting procedures shall be as follows:

- No surface, which is to be sandblasted, shall be given a coat of primer or paint in the shop or in the field before sandblasting.
- Unless otherwise specified, all iron or steel surfaces which are to be painted as submerged metal shall be dry sandblasted on the site in accordance with Specification SP-10, near white blast cleaning.
- Except as otherwise specified, all metal surfaces, which are to be painted as non-submerged metal, shall be commercial blast cleaned per Specification SP-6. This sandblasting shall be done not more than 12 hours ahead of the painting, subject to humidity and weather conditions between the time of sandblasting and painting operations. If any rusting of sandblasted surfaces occurs before painting, such rusting shall be removed by additional sandblasting.
- Threaded portions of valve and gate stems, machined surfaces intended for sliding contact, surfaces to be assembled against gaskets, surfaces of shafts for sprockets or to fit into bearings, machined surfaces of bronze trim on slide gates, and similar surfaces shall be masked off to protect them from the sandblasting of adjacent surfaces.

- Cadmium-plated or galvanized items shall not be sandblasted except that cadmium plated, zinc-plated, or sheradized fasteners used in assembly of equipment to be sandblasted shall be sandblasted in the same manner as the other metal.
- Surfaces which cannot be sandblasted, or cannot be sandblasted and then painted after the assembly of which they are a part has been completed and placed in final position, shall be sandblasted, or sandblasted and painted, before the items are put into final position. In some cases, while the painting could be done after the items concerned were in place, the limitation on time between sandblasting and painting may make it necessary to paint the surfaces before installation of those items.
- Sand or other media residue from sandblasting operations shall be thoroughly removed, using any method necessary and consistent with the requirements of the painting system, including vacuum cleaners or other means.

- 09910.3.1.3 GALVANIZED SURFACES - Galvanized surfaces which are to be painted shall first be treated with Koppers No. 40 Metal Conditioner; Amercoat No. 59 as manufactured by Amercoat Corporation, Brea, California; Galvaprep No. 5 as manufactured by Amchem Products, Fremont, California; or approved equal.
- 09910.3.1.4 CONCRETE SURFACES - Concrete and masonry surfaces shall be free of dust, mortar droppings and spatter, fins, loose concrete particles, form release materials, oil, grease, and other deleterious materials. If required by the coating manufacturer, such surfaces shall be etched as specified below or brush off blast cleaned per Specification SP-7.
- Concrete surfaces specified to be acid etched shall be etched with a 15 to 20 percent solution of muriatic or sulfamic acid until the surface has the texture of fine sandpaper. The surface shall then be thoroughly scrubbed with clean water, rinsed, and allowed to dry.
- 09910.3.1.5 WOOD SURFACES - Wood shall be cleaned and dusted immediately prior to painting. Final dusting shall be accomplished using tack cloth. Shelves, drawers, benches, and associated woodwork shall be sanded before painting and lightly sanded between coats. Prior to application of each coat, the surfaces shall be again dusted with tack cloth to remove all dust.
- 09910.3.1.6 BITUMINOUS PAINTED SURFACES - Surfaces, which are to be painted with other than bituminous paint, and which have a bituminous coating (such as coal tar varnished pipe), shall be sealed with not less than 2 coats of Inertol Tar Stop; Sherwin-Williams Metalatex B42W100; Glidden Insulcap as manufactured by the Glidden Company; or approved equal. This seal coating shall be applied in sufficient quantity to permanently prevent bleeding of the bituminous coating.
- 09910.3.1.7 HIGH TEMPERATURE SURFACES - In general, high temperature paint shall be applied to exposed (un-insulated) steam line valves and traps, heat exchangers, and miscellaneous metal piping and equipment in piping and mechanical systems exposed to high temperatures. The Contractor shall paint these surfaces with two coats of high temperature paint as specified herein or as otherwise shown or directed. No painting shall be done on surfaces with a temperature in excess of 125 degrees F at the time of application. Immediately before application of the first coat of paint, the surface shall be sandblasted according to SSPC-SP-5 (Blast Cleaning to "white" metal). See also Subsection 09910.3.1.2 above.
- 09910.3.1.8 THINNING - No thinning of paint other than as directed by the manufacturer's published directions shall be done without the approval of the Engineer. No painting shall be done under conditions, which, in the opinion of the Engineer, will jeopardize the appearance of quality of the painting in any way.

- 09910.3.1.9 TINTING OF FIRST COAT - When two coats of the same material are specified, the first coat applied shall be tinted with aluminum powder, lampblack, or other suitable pigment to distinguish it from the top coat.
- I09910.3.1.10 BETWEEN-COATS TREATMENT - All painted surfaces shall be dusted between coats, and high gloss finish shall be lightly sanded and dusted between coats unless otherwise directed by the manufacturer.
- 09910.3.2 PAINT APPLICATION
- 09910.3.2.1 PAINTER QUALIFICATIONS - Contractor or subcontractor personnel applying the coating system shall have had past experience in application of the type or types of coatings and under similar conditions that it will be required to meet in this contract. The qualifications of personnel applying the coating system, whether Contractor or subcontractor shall be verified by the Contractor prior to allowing application to proceed. The Contractor shall not subcontract paint application to a subcontractor that is not qualified to apply the coating system.
- 09910.3.2.2 WEATHER CONDITONS - No painting shall be done under dusty conditions, during or immediately after a rain, during rainy weather, or when the temperature is less than 50°F.
- 09910.3.2.3 GENERAL REQUIREMENTS FOR LAYING-ON OF PAINT – These requirements shall be as follows:
- All work shall be done in a workmanlike manner, leaving the finished surfaces free from drops, ridges, waves, holidays, laps, or brush marks.
 - Where possible, prime coats shall be applied by brush and well worked into the surface, unless directed otherwise by the paint manufacturer.
 - Other paints may be applied by brush, roller, trowel, or spray, unless manufacturer's recommendations or these Specifications require a particular method of application.
 - Primer and intermediate coats of paint shall be un-scarred and completely integral at the time of application of each succeeding coat.
 - Each coat shall be subject to the inspection and approval of the Engineer before the next succeeding coat is applied, and defective work of any kind shall be deemed sufficient cause for re-coating the entire surface involved.
 - Where spray application is used, each coat of paint shall be applied to a thickness equivalent to a brush coat application at a coverage rate not greater than that specified by the manufacturer for a brush coat application. All spray painting shall be done with airless type spray units.
 - The time interval between paint coats shall meet the recommendations of the paint manufacturer, and these Specifications. The Contractor shall not allow excessive time or exposure between coats, where such excessive time or exposure will impair the bond between the coats.
 - The number of coats specified in these Specifications is the minimum to be applied. Suction spots between coats shall be touched up, and additional coats shall be provided if required to produce a finished surface with a solid, even color free from defects.
 - The total thickness of the coating shall be as specified. Additional coats of paint shall be added if necessary to bring the total thickness up to not less than that specified. For control, the Contractor shall determine the dry film thickness of the coatings on metal surfaces with a correctly calibrated thickness meter. The Contractor also shall check for holidays with a low voltage holiday detector. The Engineer may use the Contractor's meter and detector for additional inspection and checking deemed necessary.

- Particular care shall be used to assure that the specified coverage is secured on the edges and corners of all surfaces. Additional brush coats shall be applied if necessary to ensure coverage of the edges and corners.
- Damaged paint or scratched painted surfaces shall be sanded smooth before repainting. Sanding and repainting shall be done to such a degree and in such a manner that all evidence of the scratches or damages is obscured.

09910.3.2.4 COAL TAR EPOXY – Application of coal tar epoxy shall be as follows:

- Where called for in the Painting Schedule, shown on the Drawings, or required in these Specifications, concrete and some other submerged surfaces shall be coated with not less than two coats of coal tar epoxy.
- Only components from new, previously unopened containers shall be used to mix coal tar epoxy coatings. Coal tar epoxy shall be mixed and applied in accordance with the manufacturer's recommendations. All coating components shall be mixed with power mixers. The time during pouring or stirring will not be allowed as mixing time. The minimum mixing time as recommended by the manufacturer shall be met. Only unit quantities shall be mixed.
- Coal tar epoxy shall be applied to a total dry film thickness of not less than 16 mils.
- Some metal surfaces may require sandblasting prior to application of the coating system. See Subsection 09910.3.1.2 above.
- In some cases it may also be necessary to apply coatings to parts or subassembly surfaces before they are actually installed at their final Project or system location. All support brackets, stem guides, pipe clips, fasteners, etc., that are bolted to concrete shall be painted on all sides.
- Application of coal tar epoxy shall be performed only at the job site unless specific approval is granted for offsite application. Offsite application will not be allowed unless by an applicator with acceptable proven and documented experience in the application of coal tar epoxy systems.
- Each succeeding coat shall be applied over the previous coat as soon as possible in accordance with the manufacturer's instructions, without causing sagging. Succeeding coats shall not be delayed longer than allowed by the manufacturer's instructions. In no case shall the application of subsequent coats be made after the previous coat has set or oxidized. All coats, and the full thickness on all parts, shall be applied before the previous coat has cured. The Contractor shall check the film thickness after application, and before the coating has cured, to ensure that sufficient coating thickness has been applied. If additional coating is necessary, it shall be applied the same day. Checking and control of thickness at this stage shall be the Contractor's obligation and responsibility and not the Engineer's.
- If the surface coating has been applied for a longer period of time than the limits in the Table below, and if it is found that bituminous paint has not been applied to the specified thickness, the areas that are too thin shall be sandblasted to remove the surface film from the coating. These sandblasted areas shall then be washed and cleaned with the solvent recommended by the manufacturer and shall be re-coated within the time limits specified for coating over fresh bituminous paint. Washing or cleaning the surface of the paint with solvents or other solutions will not be a satisfactory substitute for the specified sandblasting if the painted surface is older than the time limits indicated in the table. This applies even if the paint manufacturer approves the solvent method as adequate for preparing the old surface.

TEMPERATURES AND COATING TIMES

Average Temperature	Maximum Time Between Coats
50 - 60° F	36 hours
60 - 70° F	24 hours
70 - 80° F	12 hours
80 - 120° F	4 hours

Coal tar epoxy shall not be applied when the ambient temperature is less than 50 degrees.

09910.3.2.5 **EDGES AND CORNERS** - The Contractor is hereby CAUTIONED that the edges and corners of members are difficult places upon which to build the required thickness of paint. The required thickness must be applied to all surfaces, including the corners and edges, by applying as many spray coats as necessary or by additional brush coats on the corners and edges, if necessary, in order to build up the required thickness.

09910.3.3 **FINISH SCHEDULE**

The Contractor shall finish all work as follows unless indicated otherwise on the drawings or within these Specifications:

TABLE OF FINISH SCHEDULES

NO FINISH	FACTORY FINISH	SITE FINISH
Stainless Steel Surfaces	Heating Units	Interior Concrete Building
Polished Aluminum Surfaces	Electric Control Panel Cabinets	Floors and Walls
Chain Link or Stock Fencing	Cranes & Hoists	Interior Building Walls &
Name Plates	Gauges and Meters	Ceiling
Exterior Concrete	Instruments	All Interior and Exterior
Exterior Masonry Surfaces	Light Fixtures and Cover Plates	Exposed Piping Valves & Pipe
Exposed Plastic Pipe & Fittings	Electrical Wiring & Transformers	Supports
Warning Labels	Ventilating Fans	Exposed Electrical Conduit &
Operating Instructions	Dampers	Junction Boxes
Gratings	Air Conditioning Units	Entry Doors and Frames
Buried or Encased Pipe	Metal Soffit & Fascia Covering	Wood Moldings and Trim
	Roofing and Siding	Other Exterior Surfaces
	Roll-Up Overhead Doors	Indicated on drawings
		Motors, Pumps, Equipment

09910.3.4 **CLEANUP**

Upon completion of painting, the Contractor shall remove all masking and protective covers and properly dispose of all rubbish, debris and unused paint materials. The Contractor shall remove and cleanup all paint overspray, drips, spatters and etc. from any and all surfaces where it does not belong.

09910.4 METHOD OF MEASUREMENT**09910.4.1 NO MEASUREMENT**

Separate measurement for Painting will not be made when painting is included as part of an item, building or structure listed in the Bid Schedule.

09910.4.2 SEPARATE MEASUREMENT

Separate measurement for Painting will be made as a Lump Sum when painting is listed as a separate item in the Bid Schedule.

09910.5 BASIS OF PAYMENT

When Painting is included as part of the measurement of another item, structure or building listed in the Bid Schedule, separate payment will not be made.

When Painting is required for a specific item, the accepted quantity will be paid for at the contract unit price for:

PAY ITEM	UNIT
<i>Paint (Item Description)</i>	Lump Sum

