

## SECTION 09 91 13

### EXTERIOR FIELD PAINT AND COATINGS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Section Includes: Surface preparation and the field application of paint systems.
1. Concrete.
  2. Fiber cement board.
  3. Clay masonry.
  4. Concrete masonry units (CMUs).
  5. Steel and iron.
  6. Galvanized metal.
  7. Aluminum (not anodized or otherwise coated or prefinished).
  8. Wood.
  9. Portland cement plaster (stucco).
  10. Gypsum board.
  11. Cotton or canvas insulation covering.
  12. Bituminous coated surfaces.

##### 1.2 DEFINITIONS

- A. Standard coating terms defined in ASTM D 16 apply.
1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85 degrees meter.
  2. Eggshell refers to low sheen finish with a gloss range between 20 and 35 when measured at a 60 degrees meter.
  3. Semigloss refers to medium sheen finish with a gloss range between 35 and 70 when measured at a 60 degrees meter.
  4. Full gloss refers to high sheen finish with a gloss range more than 70 when measured at a 60 degrees meter.

##### 1.3 ACTION SUBMITTALS

- A. Product Data: Technical data and product information for block fillers, primers, paints, and coatings, including label analysis and instructions for handling, storing, surface preparation, and application for each paint and coating system.
1. For field painting of factory primed metal products and fabrications, submit technical data for each type of paint product, surface preparation requirements, and application instructions.

2. Indicate manufacturer's instructions for special surface preparation procedures and substrate conditions requiring special attention.
  3. Product List: Provide inclusive list of required coating systems and materials. Indicate each material and cross reference specific coatings, finish system, and application. Identify each material by manufacturer's catalog number, series, and general classification. Use same designations indicated in Finish Schedules.
- B. Samples: Submit aged (minimum seven days) paint samples for each type of paint system and each color and gloss of topcoat.
1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
  2. Provide list of material and application for each coat of each sample. Label each sample as to location and application.
  3. Submit samples on substrates for review of color and texture:
    - a. Concrete: Two 4 inch (50 mm) square samples for each color and finish.
    - b. Concrete Masonry: Two 4 inch by 8 inch (100 mm by 200 mm) samples of masonry, with mortar joint in the center, for each finish and color.
    - c. Painted Wood: Two 12 inch (305 mm) square samples of each color and material on hardboard.
    - d. Ferrous and Nonferrous Metals: Two 4 inch (100 mm) square samples of flat metal and two 8 inch (200 mm) long samples of solid metal for each color and finish.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Quality Control Submittals: Furnish certificates from manufacturer that products supplied comply with VOC content limits and emission in accordance with local, state, and federal regulations and sustainability limit requirements.

#### 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with Federal and local toxicity and air quality regulations and with Federal requirements on content of for heavy metals including but not limited to: lead and mercury. Do not use solvents in paint products that contribute to air pollution.
- B. Applicator Qualifications: Entity having minimum 5 years documented experience in applying paints and coatings similar in material, design, and extent to those indicated.
- C. Source Limitations:
1. Provide exterior field paints by the same manufacturer to the greatest extent possible.
  2. Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
  3. Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

- D. Coordination of Work: Coordinate field finishing of shop primed metals are provided to ensure compatibility of total systems for various substrates.
- E. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
    - b. Other Items: Architect will designate items or areas required.
  - 2. Final approval of color selections will be based on mockups.
    - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
  - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Container Labels: Include manufacturer's name, type of paint, brand name, lot number and date of manufacturer, brand code, coverage rate, surface preparation, instructions for mixing and reducing drying time, cleanup requirements, color designation, and application instructions.
- B. Store materials not in use in tightly covered containers in well ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F (7 degrees C).
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

#### 1.7 FIELD CONDITIONS

- A. Do not thin or add water to waterbased paints, including waterbased alkyds.
- B. Weather Conditions:
  - 1. Apply paints when temperature of surfaces to receive paint and ambient air temperatures are between 50 degrees F and 95 degrees F (10 degrees C and 35 degrees C).
  - 2. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.
  - 3. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (35 degrees C) for exterior, or as indicated by manufacturer's Product Data Sheet.

- C. Apply solvent thinned paints when temperatures of surfaces to receive paint and surrounding air are between 45 degrees F. and 95 degrees F (7 degrees F and 35 degrees C).
  - 1. Minimum Application Temperature for Varnish Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.
- D. Painting may continue during inclement weather if surfaces and areas to receive paint and coatings are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.
- E. Provide lighting level of 80 foot candles (860 lx) measured midheight at substrate surface.
- F. Labels: Do not paint over Underwriters Laboratories, Factory Mutual, other code required labels, or equipment name, identification, performance rating, or nomenclature plates.

## 1.8 EXTRA MATERIALS

- A. Furnish extra materials from the same product run, matching products installed and packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: Minimum 1 gal. (3.8 L) of each material and color applied. In addition to manufacturer's label, identify each container with color, type, texture, and room location.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Performance and Durability:
  - 1. ASTM D 16 Standard Test Method for Load Testing Refractory Shapes at High Temperatures.
  - 2. ASTM D 2486 Standard Test Method for Scrub Resistance of Interior Wall Paint.
  - 3. ASTM D 2805 Standard Test Method for Hiding Power of Paints by Reflectometry.
  - 4. ASTM D 4828 Standard Test Method for Practical Washability of Organic Coatings.
- B. Chemical Components of Paints and Coatings: Provide products complying with limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
  - 2. Restricted Components: Paints and coatings shall not contain components restricted by the EPA.

## 2.2 MATERIALS

- A. Basis of Specifications: . Subject to compliance with requirements, provide first quality commercial or industrial products of one of the specified manufacturers. Residential products are not permitted:
  - 1. Benjamin Moore & Co.
  - 2. Devoe High Performance Coatings.
  - 3. Kelly-Moore Paint Company Inc.
  - 4. Pittsburgh Paints.
  - 5. Sherwin-Williams Company (The).
- B. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Accessories: Linseed oil, shellac, turpentine, paint thinners, and similar materials not specifically indicated but necessary to achieve the finishes specified for commercial quality.
- D. Patching Materials: Latex filler compatible with paint systems.
- E. Fastener Head Cover Materials: Latex filler.
- F. Colors: Indicated in Finish Schedule or as selected by the Architect.

## 2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
  - 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  - 2. Testing agency will perform tests for compliance with product requirements.
  - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
- B. Test substrates after repairing and cleaning substrates but prior to application of paint and coatings.
  - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
    - a. Concrete: 12 percent.
    - b. Fiber Cement Board: 12 percent.
    - c. Masonry (Clay and CMUs): 12 percent.
    - d. Wood: 15 percent.
    - e. Portland Cement Plaster: 12 percent.
    - f. Gypsum Board: 12 percent.
  - 2. Test cementitious substrates and plaster cement/stucco for alkalinity (pH).
- C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.
- D. Exterior Gypsum Board Substrates: Verify joints are properly taped and finishing compound is sanded smooth.
- E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
  - 1. Verify previously painted surfaces can be stripped to bare substrate, repaired if necessary, and prepared to receive new paint or coating system consisting of primer and two top coats at a minimum.
    - a. Note: When previously painted surfaces have failed to accept new paint systems, determine cause of failure and take corrective measures to ensure each surface accepts new paint or coating system. Failure of new paint system is not permitted.
  - 2. Shop Primed Metals: Inspect shop primed metals to determine if primer is in condition to receive and is compatible with topcoats.
- F. Commence paint and coating application after correcting unsatisfactory conditions and surfaces are dry. Application of coating indicates applicator's acceptance of surfaces and conditions.

#### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Coordination of Work:
  - 1. Preprimed Substrates: Inspect existing conditions in which primers are factory applied to ensure compatibility of the total system for each substrate. Notify

- Architect of anticipated problems when using the materials specified over factory primed or preprimed substrates.
2. Existing Painted Surfaces: Inspect previously painted surfaces to ensure compatibility of the existing paints with new paint system for each substrate. Notify Architect of anticipated problems.
  3. Repair defects and clean surfaces affecting bond with paint system. Remove existing paints exhibiting loose surface defects showing signs of rust, scale, or delamination.
  4. Seal marks which may bleed through surface finishes.
  5. Touch up shop primer or previously painted surfaces prior to application of topcoats.
- C. Surface Cleaning: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each substrate condition. Provide barrier coats over incompatible primers or remove and reprime. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting
1. Before applying paint or surface treatments, clean substrates of substances that impair bond of the various coatings. Remove oil and grease before cleaning. Schedule cleaning and painting so dust and contaminants from the cleaning process will not fall on wet, newly painted surfaces.
  2. Remove in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, protect items before surface preparation and painting.
    - a. After completing painting operations, reinstall removed items. Remove surface applied protection from in place items.
  3. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
  4. Seal marks which may bleed through surface finishes with shellac. Provide barrier coats over incompatible primers or remove and reprime.
  5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- D. Cementitious Substrates: Remove release agents, curing compounds, efflorescence, chalk, dust, dirt, grease, oils, release agents, mold, mildew, and existing paint. Roughen as necessary to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
1. Use abrasive blast cleaning methods if recommended by paint manufacturer.
  2. Do not paint surfaces if moisture content or alkalinity of surfaces exceeds that permitted in manufacturer's written instructions.
    - a. Determine alkalinity and moisture content of surfaces by performing appropriate pH testing. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct condition prior to application of paint.
    - b. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m).

- c. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation after substrates have obtained percent relative humidity level recommended by paint manufacturer.
    - d. Perform additional moisture tests when recommended by manufacturer. Proceed with installation when moisture content complies with that permitted in manufacturer's written instructions.
    - e. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to thoroughly dry.
  3. Clean concrete decks and floors to receive paint or coating with a 5 percent solution of muriatic acid or etching cleaner. Flush floors with clean water to remove acid; neutralize with ammonia, rinse, allow to dry; vacuum before painting.
- E. Ferrous Metals: Remove rust, loose mill scale, and shop primer. Clean ungalvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations.
  1. SSPC-SP 6/NACE No. 3: Where rust is present, Blast steel surfaces clean to prepare for prescribed paint system.
  2. .
  3. SSPC-SP 3 minimum.
  4. SSPC-SP 11.
- F. Shop Primed Ferrous Metal Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop primed surfaces.
  1. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
  2. Touch up bare areas and damaged shop applied prime coats. Wire brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
- G. Galvanized Ferrous Metal Substrates: Clean galvanized surfaces with nonpetroleum based solvents leaving surface free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Aluminum Substrates: Remove surface oxidation with acid etch and solvent washing. Remove oil, grease, surface oxidation, and contaminants in accordance with SSPC SP-1 Solvent Cleaning. Apply etching primer immediately following cleaning.
- I. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- J. Wood Substrates: Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

1. Sand surfaces that will be exposed to view, and dust off.
  2. Prime, stain, or seal wood to be painted. Prime edges, ends, faces, undersides, and back sides of wood, as applicable.
  3. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- K. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- L. Mildew and Mold Removal: Remove mildew and mold by high power washing (pressure range of 1500 to 4000 psi) with solution of trisodium phosphate and bleach. If substrate is too soft for high power washing, scrub substrate with solution. Rinse with clean water and allow surface to dry.
- M. Protective Coverings: Provide protections for duration of the work, including covering furnishings and decorative items. Protect and mask adjacent finishes and components against damage, marking, overpainting, and injury. Clean and repair or replace damage caused by painting.
- N. Renovated Surfaces: Clean surface free of loose dirt and dust. Except at gypsum board surfaces, remove existing paint and coatings to bare substrate and prepare substrates to receive new paint system. Test substrate to verify it will bond with primer and receive new paint system without failure. If test fails, clean surface to base substrate and apply barrier coat. Retest to verify surface will accept new paint system.
1. Remove surface film preventing proper adhesion and bond.
  2. Wash glossy paint with a solution of sal soda and rinse thoroughly.
  3. Remove loose, blistered, and defective paint and varnish; smooth edges with sandpaper.
  4. Clean corroded iron and steel surfaces.
  5. Repair and blend into portland cement plaster.
  6. Prime bare surfaces.
  7. Tone varnished surfaces with stain bringing to uniform color.
  8. If existing surfaces cannot be put in acceptable condition for finishing by customary cleaning, sanding, and puttying operations, notify Owner and do not proceed until correcting unsatisfactory conditions.
- O. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair. Sand taped joints and repaired defects smooth.
- P. Plaster/Stucco Substrates: Remove contaminants, release agents, curing compounds, efflorescence, chalk, mold, mildew, and similar deterrents. Spot patch existing plaster to eliminate blisters, buckles, excessive crazing, and to check cracking, dryouts, efflorescence, sweat outs, and similar defects the prevent plaster from bonding with paint or coatings. Sand or texture repair or patch to match adjacent finish and to remove trowel marks and arrises.
1. Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

2. Deep Cracks: Clean out and fill deep cracks with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
  3. Do not paint surfaces if moisture content or alkalinity of surfaces exceeds that permitted in manufacturer's written instructions. Test for alkali using litmus paper.
  4. Allow patching and repair compounds to set and cure before painting.
- Q. Exterior Insulation and Finish System: Remove oil, grease, and contaminants from acrylic top coat. Fill hairline cracks, small holes, and imperfections.
- R. Pipe Covering and Insulation: Remove loose, foreign, and objectionable material before applying sealing coat.
- S. Barrier Coat: Provide barrier coats over incompatible primers or remove and reprime. Notify Owner in writing of anticipated problems using specified finish coat material over previously coated substrates.
- T. Paint and Coating Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
  3. Do not use thinners for water based paints.
  4. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.
- U. Asphalt, Creosote, or Bituminous Surfaces Scheduled for Paint Finish: Remove foreign particles to permit adhesion of finishing materials. Apply compatible sealer or primer.
- V. Copper Surfaces Scheduled for Paint Finish: Remove contamination by steam, high pressure water, or solvent washing. Apply vinyl etch primer immediately following cleaning.
- W. Copper Surfaces Scheduled for Natural Oxidized Finish: Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for required effect. Once attained, rinse surfaces with clear water and allow to dry.
- X. Glue Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
- Y. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- Z. Wood and Metal Doors: Seal top and bottom edges with primer.

### 3.3 APPLICATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
1. The term exposed surfaces includes areas visible when permanent or built in fixtures, grilles, convector covers, covers for finned tube radiation, and similar components are in place. Extend coatings in these areas to maintain system integrity and provide desired protection.
  2. Provide finish coats compatible with primers.
  3. Use applicators and techniques suited for paint and substrate indicated.
  4. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat.
  5. Paint exposed surfaces. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces.
    - a. Field painting of exposed surfaces include bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory applied final finish.
    - b. Areas visible when permanent or built in fixtures, grilles, convector covers, covers for finned tube radiation, and similar components are in place.
    - c. Extend coatings in areas, as required, to maintain system integrity and provide desired protection.
  6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  7. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  8. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  9. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or surface imperfections. Cut in sharp lines and color breaks.
  10. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
  11. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  12. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
  13. Sand lightly between each succeeding enamel or varnish coat.
  14. Paint entire exposed surface of window frames and sashes.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

- C. If undercoats or substrate conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Minimum Coating Thickness: Apply paint materials to dry film thickness indicated in pain schedule but no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
  - 1. Measure film thickness on magnetic surfaces by use of Elcometer thickness gauge and on nonmagnetic surfaces by pit gauge or Tooke Gauge.
- F. Application: Apply first coat to surfaces that have been cleaned, pretreated, or prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
  - 2. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished after removing rust and scale and priming or touching up surface sand if acceptable to topcoat manufacturers.
  - 3. If undercoats, stains, or conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.
  - 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried and cured to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- G. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
  - 1. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
  - 2. Prime and paint uninsulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, heat exchangers, tanks, ductwork, conduit, switchgear, and paintable insulation except where items are prefinished.
  - 3. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
  - 4. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

5. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names, and numbering.
  6. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
  7. Concealed Members: Wherever steel and metal parts to receive paint are built into and concealed by construction, paint as specified for exposed parts so finish painting is complete before members are concealed.
  8. Paint the following work where exposed to view:
    - a. Equipment, including panelboards .
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
    - g. Tanks that do not have factory applied final finishes.
    - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or paintable jacket material.
  9. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.
- H. Items not to Receive Paint: Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
- I. Electrostatic Spray Painting: Apply coating electrostatically to finished surfaces, free from runs, sags, visible overlaps, holidays, craters, pinholes and other defects detrimental to protective and decorative qualities of coating.
1. Thickness of Coatings: 1.5 to 2.0 mils dry film thickness. Measure dry film thickness with magnetic gauge.
  2. Use application techniques, equipment, materials, and preparation procedures recommended by manufacturer.
- J. Block Fillers: Apply block fillers to concrete masonry block at rate to ensure complete coverage with pores filled.
- K. Prime Coats: Before applying finish coats, apply prime coat, recommended by manufacturer, to material required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or defects due to insufficient sealing.
- L. Finish Coats: Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance without bleed through.
1. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and

- coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or surface imperfections is not acceptable.
2. Transparent (Clear) Finishes: Use multiple coats to produce glass smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.
- M. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.
- N. Touch Up: Touch up marred, scraped, and blemished areas of surfaces which were factory primed or previously coated.
1. Prepare and touch up scratches, abrasions, and blemishes and remove foreign matter before proceeding with succeeding coats.
  2. Touch up marred, scraped, and blemished areas of factory primed or previously coated surfaces.
  3. Feather touch up coating overlapping minimum 2 inches onto adjacent unblemished areas producing smooth, uniform surface.
  4. As soon after erection and installation as possible, touch up fasteners, welded surfaces and surroundings, field connections, and areas on which shop coat has been abraded or damaged with specified primer before corrosion and other damage occurs from exposure.

### 3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
  2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### 3.5 CLEANING AND PROTECTION

- A. Clean Up: At end of each day, remove rubbish, empty cans, rags, and other discarded materials from site. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- B. Protections: Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

- D. At completion of painting activities, touch up and restore damaged or defaced painted surfaces.
- E. Provide *Wet Paint* signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work. After related work is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### 3.6 PAINT AND COATING SCHEDULE

- A. Concrete, and Masonry (Other than Concrete Masonry Units): Refer to Section 09 96 53 – Elastomeric Paint Coatings.
- B. Concrete, GFRG Units, Cement Fiber Board and Masonry (Other than Concrete Masonry Units):
  - 1. Finish: Semi-Gloss acrylic latex, two finish coats.
  - 2. Primer:
    - a. GP: 3030 Bond Prep Pigmented Bonding Primer, 1.4 – 1.6 mils dft.
    - b. Moore: Super Spec Masonry 100% Acrylic Primer, N066, 1.5 mils dft.
    - c. PPG: Perma-Crete Interior/Exterior Alkali Resistant Primer 4-603, 1.2-1.5 mils dft.
    - d. S-W: Loxon Exterior Acrylic Masonry Primer A24W8300, 3.2 dft minimum.
    - e. KM: 247 Acry-Shield 100% Acrylic Exterior Masonry Primer 1.5-2.0 mils dft.
- C. Finish Coats:
  - a. GP: Ultra-Hide 150 Exterior Semi-Gloss Paint 2416V, 1.3 – 1.5 mils dft/coat.
  - b. Moore: Ultra Spec EXT Satin Finish, N448, 1.5 mils dft minimum.
  - c. PPG: 90-474 Pitt-Tech Int./Ext. Satin DTM Industrial Enamels, 2.0-3.0 mils dft/coat.
  - d. S-W: A-100 Gloss A8 Series, 1.3 dft/coat.
  - e. KM: 1250 Acry-Shield 100% Acrylic Exterior Semi-Gloss Enamel 1.5-2.0 mils dft.
- D. Concrete - Poured, Tilt-up and Precast: Refer to Section 09 96 53 – Elastomeric Paint Coatings.
- E. Concrete Masonry Units: Refer to Section 09 96 53 – Elastomeric Coatings.
- F. Metal – Aluminum, Semi-gloss:
  - 1. Finish: Semi-Gloss latex enamel, primer and two finish coats.
  - 2. Primer:
    - a. Devoe Coatings Devflex 4020PF Direct to Metal Primer/Finish, 2.0-2.2 mils dft.
    - b. Moore: Super Spec HP Acrylic Metal Primer, P04, 1.7-2.3 mils dft.
    - c. PPG: 90-712 Pitt-Tech Interior/Exterior Primer/Finish DTM Industrial Enamel, 2.0 -3.0 mils dft.

- d. S-W: Pro-Cryl Universal Acrylic Primer B66-310 Series, 2.0 – 4.0 mils dft.
  - e. KM: 5725 DTM Acrylic Primer/Finish 1.6 – 2.0 mils dft.
3. Finish Coats:
- a. Devoe Coatings Devflex 4216HP High Performance Acrylic Semi-Gloss, 1.5-4.0 mils dft.
  - b. Moore: Super Spec HP DTM Acrylic Semi- Gloss, P29, 1.5-2.5 mil dft/coat.
  - c. PPG: 90-474 Pitt-Tech Int./Ext. Satin DTM Industrial Enamels, 2.0-3.0 mils dft/coat.
  - d. S-W: Sher-Cryl HPA Semi-Gloss, B66-350 Series 2.5 – 4.0 dft/coat.
  - e. KM: 1250 Acry-Shield 100% Acrylic Exterior Semi-Gloss Enamel 1.5-2.0 mils dft.
- G. Ferrous Metal - Structural Steel and Metal Fabrications, Semi-gloss:
- 1. Finish: Semi-gloss acrylic, anticorrosive alkyd primer and two finish coats.
  - 2. Primer:
    - a. Devoe Coatings Devguard 4160 Tank & Structural Primer, 2.0 - 2.5 mils dft/coat.
    - b. Moore: Super Spec HP Acrylic Metal Primer, P04, 1.7-2.3 mils dft/coat.
    - c. PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer, 1.5 – 2.0 mils dft/coat.
    - d. S-W: Pro-Cryl Universal Acrylic Primer B66-310 Series, 2.0 – 4.0 mils dft..
    - e. KM: 1710 Kel-Guard Alkyd Rust Inhibitive Primer, 1.5 – 2.0 mils dft/coat.
  - 3. Finish Coats:
    - a. Devoe Coatings Devflex 4216HP Waterborne Acrylic Semi-Gloss Enamel, 1.5 – 4.0 mils dft/coat.
    - b. Moore: Super Spec HP DTM Acrylic Semi-Gloss, P 29, 1.5 – 2.5 mils dft/coat.
    - c. PPG: 90-1210 Pitt-Tech Plus 100% Acrylic Semi-Gloss Low VOC, 1.5 – 2.0 mils dft/coat.
    - d. S-W: Sher-Cryl HPA Semi-Gloss, B66-350 Series 2.5 – 4.0 dft/coat.
    - e. KM: 1250 Acry-Shield 100% Acrylic Exterior Semi-Gloss Enamel 1.5-2.0 mils dft.
- H. Ferrous Metal – Doors, Frames, Guardrails, Handrails:
- 1. Finish: Semi-gloss alkyd, anticorrosive primer and two finish coats.
  - 2. Primer:
    - a. Moore: Corotech Acrylic Metal Primer, V 110, 1.6-2.0 mils dft/coat.
    - b. Devoe Coatings Devguard 4160 Tank & Structural Primer, 2.0 - 2.5 mils dft/coat.
    - c. KM: 1710 Kel-Guard Alkyd Rust Inhibitive Primer, 1.5 – 2.0 mils dft/coat.
    - d. PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer, 1.5 – 2.0 mils dft/coat.
    - e. S-W: Pro-Cryl Universal Acrylic Primer B66-310 Series, 2.0 – 4.0 mils dft.
  - 3. Finish Coats:

- a. Moore: Corotech Alkyd Urethane Semi-Gloss, V201., 1.5 – 2.5 mils dft/coat.
  - b. Devoe 4306 Devguard Rust Preventative Semi-Gloss Enamel, 1.9-2.4 mils dft/coat.
  - c. KM: 1275 Weather Shield Int/Ext Semi-Gloss Oil, 1.7 – 2.2 mils dft/coat.
  - d. PPG Speedhide Int/Ext Urethane Modified Gloss Oil, 2.3 dft/coat.
  - e. S-W: Sher-Cryl HPA Semi-Gloss, B66-350 Series 2.5 – 4.0 dft/coat.
- I. Galvanized Metal - Structural Steel and Metal Fabrications: Refer to Section 09 96 59 – High Build Glazed Coatings.
- J. Galvanized Metal - Doors, Frames, Guardrails, Handrails: Refer to Section 09 96 59 – High Build Glazed Coatings.
- K. Portland Cement Plaster: Refer to Section 09 96 56 – Acrylic Coatings.
- L. Portland Cement Plaster:
1. Finish: Semi-Gloss acrylic, primer and two finish coats.
  2. Primer:
    - a. GP: 3030 Bond Prep Pigmented Bonding Primer, 1.4 – 1.6 mils dft.
    - b. Moore: Super Spec Masonry 100% Acrylic Primer, 066, 1.0 mils dft minimum.
    - c. PPG: Perma-Crete Interior/Exterior Alkali Resistant Primer 4-603, 1.2-1.5 mils dft.
    - d. S-W: Loxon Exterior Acrylic Masonry Primer A24W8300, 3.2 dft minimum.
    - e. KM: 247 Acry-Shield 100% Acrylic Exterior Masonry Primer 1.5-2.0 mils dft.
  3. Finish Coats:
    - a. GP: Ultra-Hide 150 Exterior Semi-Gloss Paint 2416V, 1.3 – 1.5 mils dft/coat.
    - b. Moore: Ultra Spec EXT Satin Finish, N448, 1.5 mils dft minimum.
    - c. PPG: 90-474 Pitt-Tech Int./Ext. Satin DTM Industrial Enamels, 2.0-3.0 mils dft/coat.
    - d. S-W: DTM Acrylic Semi-Gloss Coating B66-200 Series, 2.0 – 4.0 dft/coat.
    - e. KM: 1250 Acry-Shield 100% Acrylic Exterior Semi-Gloss Enamel 1.5-2.0 mils dft.
- M. Wood – Siding and Trim:
1. Finish: Semi-Gloss acrylic latex, primer and two finish coats.
  2. Primer:
    - a. GP: 3210 GRIPPER Int/Ext Primer Sealer, 1.8 - 2.1 mils dft.
    - b. Moore: Sure Seal Latex Primer-Sealer, 027, 1.3 mils dft.
    - c. PPG: 17-921 Seal Grip Acrylic Universal Primer, 1.3 – 1.6 dft.
    - d. S-W: A100 Exterior Latex Primer, 1.4 mils dft minimum.
    - e. KM: 255 Acry-Shield 100% Acrylic Exterior Wood Primer 1.5-2.0 mils dft.
  3. Finish Coats:
    - a. GP: Ultra-Hide 150 Exterior Semi-Gloss Paint 2416V, 1.3 – 1.5 mils dft/coat.

- b. MooreUltra Spec EXT Satin Finish, N448, 1.5 mils dft minimum.
- c. PPG: 90-474 Pitt-Tech Int./Ext. Satin DTM Industrial Enamels, 2.0-3.0 mils dft/coat.
- d. S-W: DTM Acrylic Semi-Gloss Coating B66-200 Series, 2.0 – 4.0 dft/coat.
- e. KM: 1250 Acry-Shield 100% Acrylic Exterior Semi-Gloss Enamel 1.5-2.0 mils dft.

N. Wood – Plywood:

- 1. Finish: Semi-Gloss acrylic latex, primer and two finish coats.
- 2. Primer:
  - a. GP: 3210 GRIPPER Int/Ext Primer SealerHydrosealer Primer Sealer 6001-1200, 1.8 - 2.1mils dft.
  - b. Moore Sure Seal Latex Primer-Sealer, 027, 1.3 mils dft.
  - c. PPG: 17-921 Seal Grip Acrylic Universal Primer, 1.3 – 1.6 dft.
  - d. S-W: A100 Exterior Latex Primer, 1.4 mils dft minimum.
  - e. KM: 255 Acry-Shield 100% Acrylic Exterior Wood Primer 1.5-2.0 mils dft.
- 3. Finish Coats:
  - a. GP: Ultra-Hide 150 Exterior Semi-Gloss Paint 2416V, 1.3 – 1.5 mils dft/coat.
  - b. Moore: Ultra Spec EXT Satin Finish, N448, 1.5 mils dft minimum.
  - c. PPG: 90-474 Pitt-Tech Int./Ext. Satin DTM Industrial Enamels, 1.1 – 1.3 mils dft/coat.
  - d. S-W: DTM Acrylic Semi-Gloss Coating B66-200 Series, 2.0 – 4.0 dft/coat.
  - e. KM: 1250 Acry-Shield 100% Acrylic Exterior Semi-Gloss Enamel 1.5-2.0 mils dft.

O. Wood – Solid Stain:

- 1. Finish: Acrylic solid color stain, two finish coats.
- 2. Finish Coats:
  - a. GP: Wood Pride Water-Based Solid Color Siding Stain 2600, 1.1 – 1.3 mils dft/coat.
  - b. Moore: Arborcoat Solid Deck & Siding Stain, 640.
  - c. PPG: 77-1110 Series Sun-Proof, Fence & Siding Solid Color Latex Stain, 1.1 – 1.6 mils dft/coat.
  - d. S-W: WoodScapes Solid Color Acrylic Exterior House Stain, 1.3 – 2.5 mils dft/coat.
  - e. KM: 1240 Acry-Shield 100% Acrylic Exterior Flat Paint 1.5-2.0 mils dft.

P. Wood – Semi-transparent Stain:

- 1. Finish: Semi-transparent stain; one finish coat.
- 2. Finish Coat:
  - a. Moore: Arborcoat Semi-Transparent Deck And Siding Stain, 638.
  - b. PPG:
  - c. S-W: Semi-Transparent Polyurethane Exterior Stain.
  - d. KM: 1285 Acry-Shield Alkyd Modified Acrylic Exterior Semi-Solid Stain 0.8-1.0 mils dft.

END OF SECTION

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