

DIVISION 09 - FINISHES
SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Surface preparation and field application of paints and coatings.

1.02 REFERENCES

- A. American Society for Testing and Materials
 - 1. ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. National Association of Corrosion Engineer
 - 1. NACE - Industrial Maintenance Painting.
 - 2. NPCA - Guide to U.S. Government Paint Specifications.
- C. Steel Structures Painting Council
 - 1. SSPC - Steel Structures Painting Manual.

1.03 DEFINITIONS

- A. Refer to ASTM D16 for interpretation of terms used in this Section.

1.04 SUBMITTALS

- A. Submit in accordance with the requirements of Section 01 33 00.
- B. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- C. Samples: Submit samples of manufacturer's available paint colors for selection.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

1.05 COORDINATION

- A. Completely paint and finish all new surfaces throughout the project, including but not limited to, building, all new exposed piping, and mechanical equipment.

- B. The Contractor shall familiarize himself with the specifications of various other trades and all surfaces left unfinished by the requirements of their specifications shall be painted or finished as part of this Contract.
- C. All finish coat paint materials must be compatible with shop or manufacturer's prime coat materials.
- D. No painting work shall be initiated until the item of equipment, materials, tankage, piping, or duct has satisfactorily passed the required testing.

1.06 QUALITY ASSURANCE

- A. Field Samples
 - 1. Provide field sample of paint when requested by the Authority.
 - 2. Provide field sample on smooth plywood, 12 inches square, illustrating coating color, texture, and finish.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, Federal Specification number, contents by volume, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Store paint materials at minimum ambient temperature of 45°F and a maximum of 90°F, in ventilated area, and as required by manufacturer's instructions.
- D. Storage space shall be kept clean at all times. Every precaution shall be taken to avoid fire hazards.

1.08 PROJECT/SITE CONDITIONS

- A. Environmental Requirements
 - 1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the manufacturer.
 - 2. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the manufacturer.
 - 3. Minimum Application Temperatures for Paints: 45°F for interiors; 50°F for exterior; unless required otherwise by manufacturer's instructions.

1.09 MAINTENANCE

- A. Extra Materials
 - 1. Provide one gallon of each color and type to Owner.

2. Label each container with color, type, texture, and locations in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Paint materials listed in the Schedule, are products of Tnemec and Carboline unless otherwise stated.
- B. Equivalent products of the following manufacturers may be used subject to approval.
 1. M.A.B. Paints, Inc.
 2. Sherwin-Williams, Inc.
 3. Or Equal

2.02 MATERIALS

- A. Coatings: Ready mixed, except field-catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- C. Patching Materials: Latex filler.
- D. Fastener Head Cover Materials: Latex filler.
- E. Provide undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- F. Chemical Paint Remover: Manufacturer's standard formulation for removing paint coatings from masonry, concrete, or metal.
- G. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film forming, strippable masking material for protecting glass and metal surfaces from damaging effect of cleaners and removers.

2.03 FINISHES

- A. Refer to paint schedule on the Contract Documents at end of section for surface finish schedule.
- B. Colors to be selected by Owner; not necessarily manufacturer's standard colors. Refer to color schedule at end of section and Contract Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify site conditions.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer. Verification by manufacturer's representative.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Starting of painting work will be construed as Contractor's acceptance of surfaces and conditions within any particular area or associated with any equipment or product.
- E. Test shop applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.

3.02 GENERAL PREPARATION PROCEDURES

- A. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Schedule cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly painted surfaces.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.
- C. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Correct defects and clean surfaces, which affect work of this Section. Remove existing coatings that exhibit loose surface defects.
- E. Seal with shellac and seal marks, which may bleed through surface, finishes.
- F. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- H. Galvanized Surfaces Do not paint.
- I. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, fins and protrusions, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- J. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool wire brushing or

sandblasting; clean by washing with solvent as defined by SSPC SP1 methods. Ferrous metal surfaces subject to immersion service or wet conditions will be prepared in accordance with SSPC SP10 abrasive blast procedures as per instructions under 3.08. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

- K. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent as per SSPC SP 1 methods. Prime bare steel surfaces.
- L. Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Sandpaper to smooth finish prior to final coat.
- M. Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.
- N. Plastic Surfaces: Sandpaper to rough surface, remove dust.
- O. Exposed Tar Coated Pipes and Fittings: All exposed or nonsubmerged piping and fittings which are tar coated and which are to be painted shall receive one coat of primer equal to Carbogaurd 60 @ 2.0 – 3.0 mils DFT, prior to applying finish coats.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry.
- C. Apply each coat to uniform finish. Finished surface shall be uniform in finish and color and free of brush marks, sagging, corduroy and other imperfections. Should any coat be judged unsatisfactory, Contractor shall sandpaper or otherwise clean off this coat and apply another. If the undercoating is disturbed, complete refinishing will be required.
- D. Apply each coat at rate specified by manufacturer to achieve the minimum thickness recommended by manufacturer. Deficiencies in film thickness shall be corrected by application of additional coat(s) of paint.
- E. Apply paint under conditions of adequate ventilation and illumination.
- F. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- G. Finish exterior doors on tops, bottoms and side edges same as exterior faces.
- H. Omit first coat (primer) on metal surfaces, which have been shop-primed and touch-up painted, unless otherwise indicated.
- I. Edges of paint or finish adjoining other materials or colors shall be sharp and clean without overlapping. Should workmanship be found defective, proper preparatory work shall be done and additional coats applied as necessary to give a finish in accordance with specified requirements. All finish hardware, accessories, fixtures and similar items installed prior to painting and not required to be painted, shall be removed or protected

during such painting. If removed, the items shall be carefully replaced and adjusted upon completion of the painting.

- J. All paint shall be airless spray roller or brush applied. Extreme care shall be exercised in spray application that no finished materials are damaged. If this condition should occur, repair or replace damaged materials.
- K. Contractor shall protect his work, work by others, adjacent work, and existing plant by carefully covering with drop cloths. Upon completion of work, remove all paint spots from the floors, glass and other surfaces. Remove from the premises all rubbish and accumulated materials. When all other trades are finished, inspect building and equipment and touch up all abrasions, scratches, etc. to the satisfaction of Engineer. Contractor shall be responsible to deliver the painting work in a clean and undamaged condition.
- L. Apply prime coat to material which is required to be painted or finished, and which has not been prime coated by others.
- M. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- N. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- O. Sand wood and metal lightly between coats to achieve required finish.
- P. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
- Q. Allow applied coat to dry before next coat is applied.
- R. Prime concealed surfaces of interior and exterior woodwork with primer paint.
- S. Paint complete surface of all exposed pipes and valves.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Engineer shall provide schedule of color coding and identification banding of equipment, duct work, piping, and conduit. See color schedule at end of section.
- B. Paint shop primed equipment. Any equipment shop primed with an epoxy-based primer must be finish coated with a compatible epoxy product.
- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports except where items are prefinished, with either baked enamel, stainless steel, or aluminum.
- E. Paint exposed electrical equipment same color as adjacent wall.
- F. Paint both sides and all edges of plywood backboards for electrical and telephone equipment before installing equipment.

- G. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements of Engineer. Color band and identify with flow arrows and names for each exposed pipeline. Provide names and numbers in each item of equipment. All pipe and equipment banding and identification will be in corresponding colors selected by Engineer.
- H. Re-install electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 PROTECTIVE PAINTING

- A. Aluminum: Aluminum surfaces shall be prevented from direct contact with dissimilar materials or concrete by one of the following methods:
 - 1. Dissimilar metals, except stainless steel, white bronze, and solid zinc, shall be painted with a heavy brush or spray coat of zinc-chromate primer and one coat of aluminum paint; or shall be painted with one heavy brush coat of alkali-resistant bituminous paint; or shall be separated from the aluminum by a heavy coat of mastic caulking compound, or by a non-absorptive tape or gasket.
 - 2. Dissimilar metals used in locations where drainage from those metals passes over aluminum shall be painted to prevent staining of aluminum.
- B. Copper:
 - 1. Copper piping shall be prevented from direct contact with concrete surfaces with a complete coating of a coal tar epoxy.
 - 2. For copper pipe penetrations through walls or floors or other concrete surfaces, the protective coating shall extend no less than 2 inches from the concrete surface.

3.06 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.07 SURFACE PAINTING REQUIREMENTS

- A. Provide painting of all interior and exterior exposed items and surfaces throughout project, except as specifically otherwise indicated.
- B. Completely paint and finish all surfaces throughout the interior and exterior of the building; exposed piping, mechanical equipment, cabinet work and to provide protective coatings on concrete structures in contact with liquid and earth.
- C. Contractor shall become completely familiar with the specifications of various trades and other prime contractors and all surfaces left unfinished by the requirements of their specifications shall be painted or finished as part of this Contract with the exception of the following:
 - 1. Aluminum Work
 - 2. Ceiling Tile
 - 3. Primer coat on items specified to be primed at the shop

4. Electrical Panels
 5. Stainless Steel Items
 6. Other non-ferrous metal such as brass, bronze, copper, etc., unless specifically indicated.
- D. Unless otherwise indicated on the Drawings, the painting shall include all new surfaces installed as a part of this project, specifically including, but not necessarily limited to, the following items:
1. All interior masonry concrete walls and ceilings.
 2. All interior woodwork.
 3. All miscellaneous metal work other than aluminum fabrications.
 4. All machinery and equipment, including HVAC and electric equipment furnished by others.
 5. All piping, valves and appurtenances.
 6. All structural steel and metal roof decks.
 7. Dissimilar metals protection.
 8. Protection of copper from concrete.
 9. Exterior reinforced concrete building and tank walls shall not be painted above grade.
 10. The omission of minor items not described herein shall not relieve the Contractor of his obligation to include such items where they come within the general intent of these Specifications.

3.08 PAINT SCHEDULE

All such notations “2.0 – 3.5” refers to dry film mills. The Authority shall select color from manufacturer’s standard colors, unless otherwise noted.

- A. Masonry Surfaces (Interior Walls & Ceilings above grade cast-in-place or precast)
1. Surface Preparation: 28 day cure. Prepare surfaces in accordance with 3.02.1. Surfaces shall be clean and dry.
 2. First Coat: N69 Epoxoline / Carboguard 60 @ 2-3 mils DFT.
 3. Second Coat: 1075 Endurashield / Carboline Sanitile 655 @ 3-5 mils. DFT.
- B. Masonry Surfaces (Interior Walls & Ceilings – Porous Block)
1. Surface Preparation: Surface shall be clean and dry.
 2. Primer/Block Filler: 130 Envirofil / Sanitile 100 @ 75 – 85 sqft/gal. (Fill voids wider than 1/4” with Series 63-1500 / Carboguard 501).

3. Second Coat: Series N69 / Carboguard 60 @ 225 sqft/gal.
 4. Third Coat: Series 84 / Sanitile 655 @ 225 sqft/gal.
- C. Interior Non-Submerged / Exterior Non-Submerged Ferrous Metals
1. Surface Preparation: SSPC-SP6 Commercial Blast Cleaning.
 2. Shop Primer: Tnemec N69-1211 / Carbogaurd 60 @ 3.0 - 5.0 mils DFT.
 3. Field First Coat: Tnemec N69 / Carbogaurd 60* @ 3.0 - 5.0 mils DFT.
 4. Field Finish Coat: Interior: Series N69 / Carbogaurd 60 ** @ 3.0 – 5.0 mils DFT.
Exterior: Series 1075 Endurashield / Carbothane 133 VOC @ 3.0 – 5.0 mils DFT.
- * Color same as finish.
** For exterior, use Tnemec 1075 Endurashield / Carbothane 133 VOC.
- D. Ferrous Metal – Immersion or Wet conditions – Not Shop Primed
1. Surface Preparation: SSPC-SP10 Near White Metal.
 2. First Coat: N69-1255 Epoxoline / Carbogaurd 60 @ 6.0 – 8.0 mils DFT.
 3. Finish Coat: 104 HS Epoxy / Carbogaurd 890 @ 6.0 – 8.0 mils DFT.
- E. Ferrous Metal – Immersion or Wet conditions – Shop Primed
1. Surface Preparation: SSPC-SP10 Near White Metal.
 2. Shop Prime: N69-1211 / Carbogaurd 60 @ 4.0 – 6.0 mils DFT.
 3. Intermediate Coat: Series N69 / Carboguard 60 @ 4.0 – 6.0 mils DFT.
 4. Finish Coat: Series 104-HS / Carbogaurd 890 @ 8.0 – 10.0 mils DFT.
- F. Metal Equipment and Machinery (Interior)
1. Surface Preparation: SSPC-SP6 Commercial Blast Cleaning.
 2. Shop Prime: N69 Epoxoline / Carbogaurd 60 @ 3.0 – 5.0 mils DFT.
 3. Field Touch-up: N69 Epoxoline / Carbogaurd 60 @ 2.0 – 3.0 mils DFT.
 4. Finish Coat: 1080 Endurashield / Carbothane 134 WB @ 3.0 – 5.0 mils DFT.
- G. Ferrous Metal (Exterior)
1. Surface Preparation: SSPC-SP6 commercial Blast Cleaning.
 2. Shop Prime: 90-97 Tneme-Zinc/Carbozinc 859 @ 3.0 – 5.0 mils DFT.
 3. Field Touch-Up: 90-97 Tneme-Zinc/Carbozinc 859 @ 2.0 – 3.0 mils DFT.

4. Intermediate Coat: N69 Epoxoline/Carbogaurd 60* @ 2.0 – 3.0 mils DFT (Light Grey Color).
 5. Finish Coat: 1075 Endurashield/Carbothane 133VOC @ 2.0 – 3.0 mils DFT.
- H. Galvanized Metal (Exterior)
1. Surface Preparation: SSPC-SP1 Solvent Cleaning. Use a pretreatment similar in performance to Great Lakes Chemical Clean & Etch.
 2. First Coat: N69 Epoxoline/Carbogaurd 60 @ 2.5 – 3.5 mils DFT.
 3. Finish Coat: 1075 Endurashield/Carbothane 133VOC @ 2.0 – 3.0 mils DFT.
- I. Mill Finish Aluminum (Exterior)
1. Surface Preparation: Surface shall be clean and dry/SSPC-SP1.
 2. First Coat: N69 Epoxoline / Carbogaurd 60* @ 1.0 – 2.0 mils DFT.
 3. Finish Coat: 1075 Endurashield/Carbothane 133VOC @ 2.0 – 3.0 mils DFT.
- J. Galvanized Metal (Interior)
1. Surface Preparation: Surface shall be clean and dry/SSPC-SP1. Use a pretreatment similar in performance to Great Lakes Chemical Clean & Etch.
 2. First Coat: N 69 / Carboguard 60 @ 2.0 – 3.0 mils DFT.
 3. Finish Coat: N69 Epoxoline / Carboguard 60 @ 2.0 – 3.0 mils DFT.
- K. Mill Finish Aluminum (Interior)
1. Surface Preparation: Surface shall be clean and dry/SSPC-SP1.
 2. First Coat: N69 Epoxoline / Carboguard 60 @ 2.0 – 3.0 mils DFT.
 3. Finish Coat: 114 Tuf Coat / Sanitile 555 @ 2.0 – 3.0 mils DFT.
- L. Generator Exhaust Pipe
1. Surface Preparation: SSPC-SP6 commercial Blast Cleaning.
 2. First Coat: 90-E-92 / Carbozinc 11 @ 1.0 – 2.0 mils DFT.
- M. Copper
1. Surface Preparation: Surface shall be clean and dry.
 2. First Coat: N69 Epoxoline/ Carboguard 60 @ 3.0 – 5.0 mils DFT.
- N. Insulated Piping
1. Surface Preparation: Surface shall be clean and dry.

2. First Coat: 28 Tufcryl / Carbocrylic 3359 @ 2.0 – 3.0 mils DFT (Light Grey Color).
 3. Finish Coat: 28 Tufcryl / Carbocrylic 3359 @ 2.0 – 3.0 mils DFT
- O. Plaster and Gypsum Wallboard
1. Surface Preparation: Surface shall be clean and dry (lime plaster, 28 day cure).
 2. First Coat: 51 – 792 / Carbocrylic 120 @ 2.0 – 3.0 mils DFT.
 3. Second Coat: 113 Tneme-Tufcoat / Sanitile 555 @ 3.0 – 4.0 mils DFT.
 4. Third Coat: 113 Tneme-Tufcoat / Sanitile 555 @ 3.0 – 4.0 mils DFT, Color to be chosen by Owner.
- P. Tar-Dipped Piping
1. Surface Preparation: Surface shall be clean and dry.
 2. First Coat: N69 Epoxoline / Carboguard 60 @ 2.0 – 3.0 mils DFT.
 3. Finish Coat: N69 Epoxoline / Carboguard 60 @ 2.0 – 3.0 mils DFT.
- Q. Galvanized Steel (mild exposure such as ducts and chain link fences)
1. Surface Preparation: Surface shall be clean and dry. SSPC-SP2 or SSPC-SP3 all rusted areas.
 2. Spot Prime: 22-Color Galv-Gard / Galvanox @ 2.0 – 3.0 mils DFT.
 3. Finish Coat: 22-Color Galv-Gard / Galvanox @ 2.0 – 3.0 mils DFT.
- R. High Temperatures (steel)
- | | |
|----------|-----------------------|
| 39-661: | Dry continuous 600F |
| 39-1061: | Dry continuous 1,000F |
| 39-1261: | Dry continuous 1,200F |
1. Surface Preparation: SSPC-SP10 Near-White Blast Cleaning.
 2. First Coat: Carbozinc CZ 11 HS @ 2.0-3.0 mils DFT.
 3. Second/Third Coat: Thermaline 4700 VOC @ 1.0 – 2.0 mils/ct.
- S. Exterior Existing Latex Coatings (Concrete or CMU)
1. Surface Preparation: High Pressure wash to remove chalk and loose existing coating. Feather all edges.
 2. First Coat: 151-Elasto-Grip / Carbocrylic 120 @ 1.5 – 2.0 mils DFT.
 3. Finish Coat: 156-Enviro-Crete / Carboline Flexide* @ 6.0. – 8.0 mils DFT.
- * If rolled or brushed, may require two coats for complete hiding and to attain DFT.

- T. Chemically Resistant Coating for Chemical Storage Sumps
1. Surface Preparation; Abrasive brush blast or diamond cup wheel grind to create surface similar in texture to 30-40 grit sandpaper. Apply Series 218 MortarClad / Carboguard 510 (Epoxy Modified Concrete) with trowel blade to thickness required to fill voids in excess of pinholes. Surfaces should pass ASTM Plastic Sheet and anhydrous calcium chloride moisture tests (< 3.5 lbs pressure) and demonstrates a pH between 7-11.
 2. Primer: 201 Epoxoprime / Semstone 110 @ 6-8 mils DFT.
 3. First Coat: 282-Tneme Glaze / Semstone 140 @ 10.0- 14 mils DFT.
 4. Finish Coat (Joints Only): 265- TG / Semstone 805 @ 60.0 + mils DFT.
- U. Interior Concrete Sealer
1. Surface Preparation: Acid Etch or brush-off blast @ 2.0 – 3.5 (28 day cure).
 2. First Coat: 203 Epoxoprime / Carboguard 1340 @ 2.0 – 3.0 mils DFT.
- V. Wood Surfaces (interior and exterior)
1. Surface Preparation: Surface shall be clean and dry.
 2. Primer: Tnemec 51-792 / Carbocrylic 120 @ 1.0 – 2.0 mils DFT.
 3. Intermediate Coat: Tnemec 29 / Carbocrylic 3359 (LT Gray) @ 2.0 – 3.0 mils DFT.
 4. Finish Coat: Tnemec 29 / Carbocrylic 3359 @ 2.0 – 3.0 mils DFT (color as chosen by Owner)
- W. Exterior Concrete Sealer
1. Surface Preparation: High pressure wash to remove dust, dirt and salt. Do not apply over wet surfaces. The material to be treated shall be dry.
 2. First Coat: Endur-O-Seal USA, Inc., CS-20 Plus (180 ft2/gal) or approved equal.
 3. Finish Coat: Endur-O-Seal USA, Inc., CS-20 Plus (180 ft2/gal) or approved equal.”
- X. Submerged Concrete
- Surface Preparation: All surfaces will be abrasive brush blasted in accordance with SSPC SP 7 Brush Blast methods removing dirt, laitance, and other contaminants which would compromise coating adhesion. Surface preparation should provide a surface profile similar to 30-40 grit sandpaper. All surfaces will be clean and dry. Surfaces should pass ASTM plastic sheet test for moisture and demonstrate a pH between 7-11.
- Option 1: Epoxy Lining w/ Trowel Grade Filler to amend bugholes.
- Primer: Series 69 / Carboguard 60 @ 6.0 – 8.0 mils DFT. Spray and backroll to force material into voids.
- Surfacer: Fill holes in excess or ¼” with broad knife applied Series 63-1500 / Carboguard

501.

Finish: Series 104 HS Epoxy / Carboguard 890 or 890 LT @ 10 – 12 mils DFT. Spray and backroll to force material into voids.

Option 2: Flexible Polyurethane Lining.

Series 69 / Carboguard 60 @ 3.0 – 4.0 mils DFT. Spray and backroll.

Series 406 / Polyclad 708 @ 30 – 50 mils DFT.

Note: Coordinate steel primer (shop) with appropriate steel section, such as Division 5 (Structural Steel) and miscellaneous metals such as equipment, etc.

3.09 COLOR CODING AND LETTERING OF PIPING

- A. All exposed piping specified shall be color coded in accordance with the Owner's standard color designation system for pipe recognition. The system shall include the application of color coding to all new and altered plant piping. In the absence of a standard color designation system, the Engineer will establish a standard color designation for each piping service category from color charts submitted by the Contractor.
- B. In addition to the legends specified herein the Engineer may order the Contractor to furnish and install additional identification legends and arrows at no additional cost to the Owner. Such additional signs may be requested near completion of the work and shall be limited to no more than five (5) signs for each type specified herein. The legends and color combinations for additional signs shall conform to the requirements specified herein.
- C. The Contractor shall submit a schedule of the colors and designations proposed in accordance with Division 1 and this Section. A minimum of four (4) color charts with cross-references to the colors listed herein shall be included with the Submittal.
- D. Piping Band: All new and altered piping shall receive identification bands. Such bands shall be 6-inches wide, neatly made by masking, and spaced at intervals of 30-inches on centers regardless of the diameter of the pipe being painted. The Contractor may use approved precut and prefinished metal bands on piping, in lieu of the masked and painted bands, where approved by the Engineer.
- E. Piping Identification Legend: The Contractor shall apply identification legends to all types and sections of piping as shown on the Drawings or as designated by the Engineer. Where there is existing piping of identical service as provided herein, the Contractor shall provide identification labels to match the existing identification labels. Such legends shall be in the form of plain block lettering giving the name of the pipe content in full or abbreviated form, and showing the direction of flow by arrows. Identification lettering shall be located midway between color coding bands where possible. Identification lettering and arrows shall be placed as directed by the Engineer, but shall generally be located each fifteen (15) feet in pipe length, and shall be properly inclined to the pipe axis to facilitate easy reading. In the event lettering and arrow identifications are required for piping less than 3/4-inch in diameter, the Contractor shall furnish and attach approved color coded tags where instructed. All lettering and arrows shall be of the plastic snap-on type, or they shall be formed by stenciling in an approved manner using white or black as directed and shall have an overall height in inches in accordance with the following table:

<u>DIAMETER OF PIPE OR PIPE COVERING</u>	<u>HEIGHT OF LETTERING</u>
3/4 to 1-1/4 inches	1/2-inches
1-1/2 to 2-inches	3/4-inches
2-1/2 to 6-inches	1-1/4-inches
8 to 10-inches	2-1/2-inches
Over 10-inches	3-1/2-inches

F. Color Schedule

<u>SERVICE</u>	<u>LEGEND</u>	<u>COLOR</u>
Reclaimed Water	Reclaimed	Purple
Raw Sewage	Raw Sewage	Gray
Natural Gas	Natural Gas	Yellow

3.10 COLOR CODING OF INTERIOR

A. The Contractor shall effect approved color coding of all interior finishes by application of a finish enamel in accordance with the colors selected by the Authority.

END OF SECTION