

SPECIFICATIONS - DETAILED PROVISIONS
Section 09871 - Coating System for Water Pumping Plants

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SECTION 09871
COATING SYSTEM FOR WATER PUMPING PLANTS

PART 1 - GENERAL

1.01 DESCRIPTION

The work included in this section consists of the furnishing of all labor, materials, apparatus, scaffolding, and all appurtenant work in connection with painting, in accordance with these specifications.

- A. Work Included. In general, the following surfaces are to be painted or coated (including interior "linings"):
1. Exposed piping and other ferrous metal surfaces, interior and exterior.
 2. All structural and miscellaneous steel.
 3. All specifically designated concrete surfaces.
 4. Equipment furnished without factory finished surfaces.
 5. All pumps and piping.
- B. Related Work Not Included. In general, the following surfaces shall not be painted:
1. Non-ferrous metals unless otherwise noted or indicated, and fiberglass.
(Galvanized metal shall not be considered a non-ferrous metal.)
 2. Concrete surfaces subject to pedestrian traffic.
 3. Electrical and mechanical equipment furnished with baked enamel surface and exempted by the District.
- C. Paint Required. In no case shall any concrete, wood, metal, or any other surface requiring protection be left unpainted even though not specifically defined herein.
- D. Protection of the Work
1. The Contractor shall take the necessary steps to protect the work of others during the time his work is in progress. The Contractor shall be responsible for any and all damage to the work.

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2. Motors, pumps, and other equipment that might be damaged by sandblasting and that are furnished with approved, factory-applied finish shall be solvent cleaned, lightly sanded, and given one (1) coat of Dutch Boy Epicote Finish No. 26-66. The District shall be the final judge as to which equipment the above requirement applies. Color shall be as determined by the District.

1.02 QUALITY ASSURANCE

A. Materials

1. Paint. All materials specified by name and/or manufacturer, or selected for use under these specifications shall be delivered unopened at the job site in their original containers and shall not be opened until inspected by the Engineer. Whenever a manufacturer's brand name is specified, it is intended to define the general type and quality of paint desired. Other paints of equal quality may be used only with written approval of the District. No paint, varnish, or stain shall be reduced or applied in any way, except as herein specifically called for or if not specifically called for, then it shall be applied in accordance with the manufacturer's recommendations.
 - a) Heavy Metals including lead, chromates and mercury are not permitted. Any coating containing toxics that require hazardous waste treatment or disposal are not permitted.
2. Fusion Bonded Epoxy Linings (and coatings). Epoxy shall be applied to all metal as designated in accordance with AWWA Standard C-213-79 by either fluidized bed application or electrostatic spray application. The minimum dry coating thickness shall be 8 mils provided however, that the thickness of coating in the grooves for valves of fittings designed to receive a rubber gasket shall be approximately 5 mils.
3. Liquid Epoxy. Where the size of the valve or other item is too large to be lined by the powder epoxy method, it shall be prepared in accordance with the requirements of AWWA Specification D102-78 Inside System No. 1 and lining shall conform to the following requirements:
 - a) Thickness of Lining. The epoxy shall be applied in 2-5 spray coats to a minimum dry film thickness of 8 mils.
 - b) Application and Cure. The first coat of liquid epoxy shall be spray applied to the prepared surface within four (4) hours after completion of sandblasting. All items to be coated and the epoxy to be applied shall be at a temperature of 50° F. at the time of application. The first coat shall be air-dried at room temperature twenty-four (24) hours prior to application of the second coat; all items shall be air-cured with adequate ventilation for seven (7) days at a temperature of 65° F.

- B. Color Selection. All color selections shall be subject to approval of submittals by the District.
- C. Primer and Intermediate Coats. Primer and intermediate coats of paint shall be unscarred 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 recoating the entire surface involved.

Sufficient time shall be allowed between coats to insure proper drying, unless these specifications or manufacturer's recommendations specifically state otherwise. Excessive time or exposure between coats shall not occur in cases where such excessive time or exposure will impair the bond between coats.

1.03 SUBMITTALS

Submit samples of field-applied paint and coating finishes, colors, and covering at least sixty (60) days prior to start of such finishing operations.

- A. Identification. Label or tag each sample or set of samples identifying the manufacturer's name and address, brand name, catalog number, project title, and intended use.
- B. Colors, Patterns, and Textures. For items required to be of selected and approved colors, patterns, textures, or other finish, submit sufficient samples to show the range of shades, tones, values, patterns, textures, or other features corresponding to the instructions and requirements specified.
- C. Factory Finish Colors. Colors of material specified to be furnished with a factory finish are subject to approval. Submit duplicate samples of factory finishes showing the full range of available colors for selection and approval.

PART 2 - PRODUCTS AND MATERIALS

2.01 PROTECTIVE COATING MATERIALS

P1	Alkyd rust-inhibitive primer	Amercoat 25 Carbocoat 150 Tnemec 413
P2	Alkyd finish	Amercoat 52 Carbocoat 139 Tnemec 2
P3	Rubber primer	Polyken Plicoflex

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2.01 PROTECTIVE COATING MATERIALS – cont'd

P4	PVC 20-mil tape (AWWA C214-83)	Polyken tape Plicoflex tape
P5	Coal Tar Epoxy	Amercoat 78 Carboline Bitumastic 300M Tnemec 413
P6	Coal Tar Mastic	Carboline Bitumastic 50
P7	Universal Primer	Carbocrylic 120 Amercoat 38 Tnemec 77 Chem-Prime
P8	Grease	Chevron E.P. Roller Grease or Texaco Rust Inhibitive Grease
P9	Epoxy	Amercoat 74 Carboguard 890 Tnemec 66
P10	Vinyl Wash Primer	Amercoat 59 Rustbond Penetrating Sealer Tnemec 32-1210
P11	Epoxy Coating - Powder	3M Scotch Coat Dow DC 3100 Furane 2611
P12	Epoxy Coating – Liquid (AWWA Std. D102-78 Inside System No. 1)	Keysite 750 Tnemec Series 20 Engard 460 H.S. Carboguard 891
P13	Waterproofing	Regular Rainguard Regular Penetreat-50 Rainproof
P14	Field Applied Finish Coat	Dutch Boy Epicote No. 26-66
P15	Acrylic Latex	Prufcoat - Prufacryl 556 Series Devoe 12XX

2.02 SURFACE PREPARATION AND COATING THICKNESS

ITEM	SURFACE PREPARATION	FIRST COAT	SECOND COAT	THIRD COAT	MIN. TOTAL DRY FILM THICKNESS (MLS)
1. Ferrous Metal Surfaces					
A. Exposed	SP65	P15	P2	P2	6.0
B. Submerged Non-Potable	SP10	P5	P5	---	16.0
C. Submerged Potable	SP10	P11 or P12	P11 or P12	---	8.0
D. Underground	SP3	P6	P6	---	32.0
E. Subjected to High Temp. (300°+ F)	SP6	P9	P9	---	8.0
F. Wearing Surfaces	None	P8	---	---	50.0
2. Steel Pipe					
A. Exterior (if not CML)	SP10	P11 or P12	P11 or P12	---	8.0
B. Exterior (if concrete encased)	SP3	P1	---	---	16.0
C. Exterior (if not CMC or concrete encased)	(Coated and wrapped per current AWWA C-203)				
3. Ferrous Metal Valves					
A. Exterior	(As described for Item 1)				
B. Interior	SP10	P11 or P12	P11 or P12	---	8.0
4. Black Steel Pipe (Buried; Exterior)	SP3	P3	P4	---	40.0
5. Galvanized Surfaces					
A. Coated in addition to galv.	SP3	P10	P2	P2	4.0
	Acid Wash & Wash Prime				
B. Buried	SP3	P3	P4	---	40.0

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2.02 SURFACE PREPARATION AND COATING THICKNESS - cont'd

ITEM	SURFACE PREPARATION	FIRST COAT	SECOND COAT	THIRD COAT	MIN. TOTAL DRY FILM THICKNESS (MLS)
6. Structural Steel		Spot			
A. Shop Primed	SP1	P1	P2	P2	5.0
B. Not Shop Primed	SP3 or SP7	P1	P2	P2	5.0
7. Mech. Equip. w/Factory Finish		Spot			
A. Field Applied Touch-up	SP2	P1	P2	---	---
B. Additional Field	SP3	P16	---	---	---
8. Aluminum Embedded in Concrete	SP1	P6	---	---	---
9. Brass and Copper Alloy	Light Blast using 60 to 80 mesh	P1 (1.5)	P2 (2.5)	P2 (1.5)	4.0
10. Concrete					
A. Interior Walls & Surfaces	Clean Surface	P15	P15	---	---

DEFINITIONS

Exposed: Above ground in pump stations, in pipe galleries, and in buildings.

Submerged: Below the top of walls of water-bearing structures whether below the liquid surface or not. Also includes interior of pipes or locations subjected to splashing and occasional wetting.

Underground: Below the ground surface and surrounded by earth.

SUPERSCRIPT NOTES

1. Surfaces of flanged faces shall be coated with red lead just prior to assembly.
2. Omit on shop-primed items and provide surface preparation SP1.

2.03 COLOR AND PAINT SCHEDULE

ARCHITECTURAL SYSTEM DESIGNATION	DESCRIPTIVE MANUFACTURERS' COLOR CODING	PAINT
PLANT BUILDINGS:		
General surface	Tan	Rustoleum #865 (Dunes Tan)
Trim & Doors	Dark Brown	Rustoleum #977 (Chestnut Brown)
Walls (metal)	Yellow-White	Dunn-Edwards #CH-60B (Parchment)

PROCESS SYSTEM DESIGNATION	DESCRIPTIVE MANUFACTURERS' COLOR CODING	PAINT
All exposed piping <u>not</u> within building or structures	Desert Tan	Koppers No. 111 Glamourtex 501

2.04 IDENTIFICATION OF PIPING

- A. Piping Systems. Identification of piping systems shall conform to the requirements of ANSI A13.1, "Scheme for the Identification of Piping System", unless otherwise specified herein.
- B. Color Identification. All exposed and/or unburied pipe, including tubing, galvanized pipe, polyvinyl chloride pipe, fiberglass reinforced pipe, and stainless steel pipe, shall be identified by color to show its use function. Color bands of an approved taped type may be used on PVC, FRP, and stainless steel pipe and all other pipe not readily susceptible to painted finish. Markers shall be adhesive type with extra strength and suitable for continuous duty at 250

F. All markers shall h

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ITEM	COLOR CODE	LABEL
Air, Low Pressure	Light Green (Sherwin Williams F65G4)	Compressed Air (as approp.) psig
Air, High Pressure (Over 50 psi)	Light Green w/Yellow Band (F65G4)	Compressed Air (as approp.) psig
Gas & LPG	Light Yellow (Sherwin Williams F65Y12)	Gas
Wash Water	Red (Sherwin Williams F65R1)	Wash Water
Pure Water (within bldg.)	Pale Blue (Sherwin Williams F65L7)	Pure Water
Oil Lines	Black	Oil
Chlorine	Safety Orange (Sherwin Williams F65E1)	Chlorine
Electrical Panel (within bldg.)	ANSI 61 - Gray	—
Electrical Conduit and Equipment (except panels)	White (Sherwin Williams F65W1)	—

PART 3 - EXECUTION

3.01 PREPARATION

A. Paint

1. Surface Preparation. The Contractor shall examine carefully all surfaces to be finished and before beginning any of his work shall see that the work of the other trades has been left or installed in a workmanlike condition to receive paint. Metals shall be clean, dry, and free from mill scale, rust, grease, and oil.
2. 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). 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 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.

3. Mixing. Paint containers shall be opened only when required for use. Paint shall be mixed only in designated rooms or spaces in the presence of the Engineer. Paint shall be thoroughly stirred or agitated to uniformly smooth consistency suitable for proper application. In all cases, paint shall be prepared and handled in a manner to prevent deterioration and inclusion of foreign matter.
- B. Epoxy Coatings. All oil and grease shall be removed from the metal by caustic degreasing or steam cleaning. The surface shall be sandblasted to near-white metal in accordance with SSPC-SP10. In order to obtain maximum adhesion of epoxy coating, the grit used for blasting shall be coarse enough to impact a tooth in the metal equal to 25% of the thickness of the coating to be applied. The metal shall be cleaned, after sandblasting, with clean, dry compressed air. Use of rags to remove residual dust after sandblasting will not be permitted.
- C. Ventilation. The Contractor shall not permit painting to begin in enclosed places until a forced draft ventilation system of sufficient air volume has been placed in operation.

3.02 APPLICATION OF PAINT

The applicator of the paint shall have had past experience in applying the type or types of coatings and under similar conditions that he will be required to meet in this contract. The Contractor shall verify the paint applicator's qualifications before subcontracting the work to him.

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.

Except that prime coats shall be applied by brush and well worked into the surface, paint may be applied by brush, roller, trowel, or spray, unless the manufacturer's recommendations or these specifications call for some particular type of application. Where spray application is used, each coat of paint shall be applied to a thickness equivalent to a brush coat application at a coverage not greater than that specified by the manufacturer for a brush coat application.

All work shall be done in a workmanlike manner, leaving the finished surfaces free from drops, waves, holidays, laps, or brush marks. Drop cloths and other coverings shall be so placed at all times as to protect floors and other surfaces from spatter and droppings. Hardware, plates, lighting fixtures, nameplates, and similar articles which are not to be painted shall be masked off or removed completely. After completion of painting, any spatter or droppings shall be removed.

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The number of coats specified 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 of 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. No holidays shall be left. 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 cover the edges and corners. The Contractor shall control and check the dry film thickness of the coatings on metal surfaces with a correctly calibrated thickness meter and shall check for holidays with a low-voltage holiday detector. The Engineer may use the Contractor's meter and detector for additional checking.

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 are obscured.

3.03 CLEAN-UP

Upon completion of his work, the painting contractor shall remove his surplus materials. All paint spills shall be removed and the entire premises shall be free from rubbish, debris, etc. caused by his work. He shall present the work clean and free from blemish so that it is acceptable in every way.

3.04 PAINT TO BE PROVIDED TO DISTRICT

At the end of the project, the Contractor shall turn over to the District 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 manufacturer's literature describing the materials and giving directions for their use shall be furnished in three (3) bound copies. A typewritten inventory list shall be furnished at the time of delivery.

3.05 WARRANTY INSPECTION

Warranty inspection shall be conducted during the eleventh (11th) month following completion of all coating work. All personnel present at the pre-job conference shall be present at this inspection. All defective work shall be repaired in strict accordance with this specification and to the satisfaction of the Engineer.

END OF SECTION 09871