ITEM 447

PAINTING AND PROTECTIVE COATING

447.1 Description. This item shall govern for the finished paints, their source and for the application of paint to structures. The painting of structures shall include, unless otherwise provided in the contract, the proper preparation of the surfaces, the application, protection and drying of the paint coatings, the protection of pedestrian, vehicular or other traffic upon or underneath the structure, the protection of all parts of the structure (superstructure or substructure) against disfigurement by splatters, splashers and smirches of paint materials and the supplying of all tools, tackle, scaffolding, labor, workmanship, paint and materials necessary for the entire work.

Surface conditions and application requirements are specified with the intent to obtain full adhesion of coatings to clean dry metal and to previously applied coats. This will require careful attention to the preparation of surfaces, to prevention of contamination and moving of coatings, during and after drying and to the uniform skillful application of each coat of paint.

Services receiving paint include:

A. Metal surfaces when designated by the plans, or in these specifications.

B. Concrete surface when noted on the plans.

C. Interior concrete surfaces of concrete boxes, when noted on the plans.

D. Galvanized steel surfaces when required by the plans, or in these specifications.

Do not paint the surface of stainless steel, aluminum, bronze, copper and lead.

447.2 Quality Assurance. All paints, sealers and coating shall be manufactured by those firms listed in Table No. 2. Products of equal quality by other manufacturers will be considered, subject to review of written submittal that includes product data and a detailed coating and painting schedule.

Contractor shall provide the manufacturer's written instructions on cleaning and coating, prior to any surface preparation or coating. Whenever possible, all coatings shall be from a single manufacturer.

447.3 Submittals. Contractor shall submit a list indicating major items to be painted, preparation, paint manufacturer, product designation and dry mil thickness.

Contractor shall also submit panels containing samples of proposed paints and coatings. Include three displays of each kind and color of paint used. Panel to be representative of material to be coated.

If requested by the Engineer, contractor shall submit 1/4 pint of each kind of paint and coating proposed for use. For all paint and coatings, contractor shall furnish Engineer with two sets of printed instructions and application sheets.

447.4 Products. Tables one and two of this specification include the paint, protective coatings and sealers for the project. Contractor shall furnish all such specific materials required for the manufacturer's coating systems, whether or not included in these specifications.

The Engineer shall select the colors. Contractor shall submit a list of items to be painted and the color charts.

Contractor shall follow the OSHA requirements of 29 CFR Part 1910.44 for "Safety Color Codes for Marking Physical Hazards".

The following general hazards are set forth as a guide:

A. Red-Fire protection equipment, danger signs and fire exit signs;

B. Orange-Moving parts of equipment protected by guards;

C. Yellow-Caution signs and all physical hazards;

D. Green-To designate safety;

E. Black & White-To indicate areas that must remain clear.

447.5 Surface Preparation. Prior to painting, concrete surfaces shall be free of all latent matter, burrs and fins, using one or more of the following methods:

A. Wash concrete surfaces with 10% solution of muriatic acid, then wash clean and free of scale, mortar, dust, moisture and other foreign matter.

B. Sandblasting may be used if adjacent equipment is adequately protected.

C. Remove oil and grease with detergent and thoroughly rinse with fresh water.

If curing compound is used, it must be removed prior to coating.

Metal surface shall be cleaned by sandblasting in the shop as required by Table 1 and leave clean, dry and ready to receive a prime coat. Contractor shall provide moisture separators to effectively remove all oil and free moisture from air supply. All dust and sand shall be removed

from surface by brushing or blowing with clean dry air and removing all sand and grit around and between joints of connecting members.

Field sandblasting shall be done only if required to correct unsatisfactorily cleaned and shop primed metal.

Oil and grease shall be removed with a solvent approved by the coating manufacturer, or by steam combined with detergent. The use of gasoline, kerosene, naptha, or carbon tetrachloride shall not be permitted.

In field work, where sandblasting is not possible, scrapers, wire brushes and other suitable grinding or chipping tools may be used for the removal of existing paint coatings prior to repainting or for cleaning before applying second coat.

Surfaces which have been cleaned, but which have started to show signs of rust or dirt, are to be cleaned again prior to coating at no additional expense to Harris County. Surfaces shall be coated the same day they are cleaned.

447.6 Application of Paint & Protective Coating. Contractor shall protect floors and all other areas where work is done with suitable drop cloths and remove oil rags and waste from work area at the close of each day's work. On completion of operations, contractor shall remove all spots, oil and stain from all surfaces and leave the entire project in a clean condition. Remove from premises, all containers and debris resulting from this work.

Contractor shall use only those thinners and solvents specified in paint formulas of the paint being used and shall use in the proportions recommended by the paint manufacturer.

Coverage shall be as recommended by the paint manufacturer and sufficient to obtain the minimum mil thickness specified. If applicable, contractor shall not exceed the maximum mil thickness specified by the manufacturer. After the final coat is applied, the thickness shall be checked with an elecometer or mikotest dry film thickness gauge. The drying time specified by the manufacturer, shall be allowed between coats.

For brush application, use first quality hog hair or suitable synthetic bristle brushes. The use of horsehair bristle brushes is not permitted. Brushes shall be kept clean and free from the accumulation of dried paint or dirt. When brushes for oil or varnish base paints are not in use, they shall be kept suspended in a linseed oil bath. Brushes shall be cleaned with turpentine or mineral spirits, before reuse. Brush application shall be by uniform thickness, consistent with specified coverage and with sufficient cross-brushing to ensure filling of surface irregularities. Care shall be exercised in painting around bolt heads and nuts and in corners and other restricted space.

Spray application shall be done with an adjustable air gun, equipped with suitable water trap to remove moisture from compressed air and with a

paint pot having a hand agitator. Application shall be made with a width of spray not less than 12 inches, nor more than 18-inches and with a suitable pressure for the particular type of paint being used. Contractor shall make frequent checks to ensure a correct spreading rate and coating and shall apply without sags or runs.

Metal surfaces shall be shop primed prior to delivery to the job site. After delivery and prior to installation, all coated metal surfaces shall be kept clean and free from corrosion. Contractor shall clean up or repair damaged areas with additional primer.

After erection or installation of metal work, clean and touch up all rust spots and all places where primer has been rubbed or scraped off and all bolts and nuts. After previously applied paint has hardened and when surfaces to receive succeeding coats of paint have been cleaned and dried, apply finish paint in accordance with Tables 1 and 2. Allow 5 days or more, as recommended by coating manufacturer for hardening of final coat for submerged surfaces.

447.7 Special Requirements. Contractor shall provide electrical flow detection equipment, such as a Tinker Rasor Holiday Detector to test areas of coatings that are to be submerged. Tests are to be performed before structure is put into the water.

447.8 Measurement & Payment. No separate payment shall be made for work performed under this item. Include the cost of same in the contract price bid for work of which this is a component part.

SEE ATTACHED TABLE NOS. 1 & 2

TABLE NO. 1

SYSTEM SCHEDULE

TABLE NO. 2 - MATERIAL REFERENCE

Type of Surface	Exposure	Cleaning	Primer	1st Coat	2nd Coat	3rd Coat	Minimum Total Mil Thickness
Structural and Misc. Steel	Exterior	NACE-#2	16	18	9	—	7.0
Structural and Misc. Steel	Interior	NACE-#3	16	17	—	—	5.5
Galvanized Steel	Interior	Solvent Cleaning	15	17	—	—	2.9
Galvanized Steel and Galvanized							

Pipe Conduit Threads	Exterior	Solvent Cleaning	15	18	9	—	4.4
Wet-Well	Interior Surfaces	Para. 3.01 A	6	13	13	—	22

Note: NACE - Reference to National Association of Corrosion Engineers.

TABLE NO. 2

PAINT, SEALER, AND COATING SCHEDULE

Symbol	Minimum Dry Mils Per Coat*	Service	Generic Type	Brand and Manufacturer
1.	N/A	Primary Sealer	Chemical Penetrant	46-V-6 Silikote Water Repellent-Mobil
2.	N/A	Weatherproof Primary Sealer	Acrylic Emulsion	600 Emulsion-Koppers Concrete and Masonry Filler 79-W-1 Exterior Latex Primer-Valspar Amercoat 5625-Ameron Cook Cocoryl 827 Series
3.	N/A	Primary Sealer	Vinyl-Acrylic Emulsion with epoxy esters	600 Emulsion-Koppers Concrete and Masonry Filler 79-W-8 Block Filler Valspar Amercoat 5625-Ameron Cook 304 Block Filler
4.	1.5	Finish Coat	Acrylic Emulsion	Koppers-600-Koppers 79 Series Exterior Latex-Valspar Amercoat 5801-Ameron Cook Corocryl 827 Series

5.	1.5	Metal Primer	Alkyd, Zinc Chromate	Penetrating Primer No 622-Koppers 13-R-50 Chromox Primer-Valspar Amercoat 5105-Ameron Cook 814-Y-436
6.	2.0	Metal Primer	Polyamide Cured Epoxy Resin	654-Epoxy Primer-Koppers 13-R-56 Epoxy Primer-Valspar Amercoat 71-Ameron Cook Co-Poly Primer 920-Y-134 Inorganic Coatings, Inc. P21 Epoxy
7.**	2.0 - 4.0 (as recommended)	Metal Primer	Polyamide Cured Epoxy Resin	Epoxy Coating Hi-Gard-Koppers 78 Series High Build Epoxy with 50% Valspar 7-T-35-Valspar Amercoat 395 (off white)-Ameron Cook Epicon MW 920-W-965 Inorganic Coatings, Inc. P21 Epoxy
8.	1.5	Finish Coats	Alkyd, Straight Long-oil	Rustarmor 500 Enamel-Koppers 12 Series Panorama Coatings-Valspar Amercoat 5401-Ameron Cook 801 Enamel
9.	2.0	Finish Coat	Aliphatic Urethane	Inorganic Coatings, Inc. P35 Urethane Dupont Imron 326 Devoe-Napko 369

				Pruthane
10.	1.5	Wood Primer	Oil Base	Thin Rustarmor 500 Koppers 400-Koppers 17-W-4 Exterior first Coater Valspar Cook 307
11.	1.5	Finish Coat	Alkyd, Straight Long-oil	Rustarmor 500 Enamel-Koppers 20 Series M. F. Enamel-Valspar Cook 801 Enamel Amercoat 5401-Ameron
12.**	4.0 - 6.0 (as recommended)	Submerged Steel, Iron and Concrete	Polyamide Cured Epoxy Resin	Epoxy Coating Hi-Guard-Koppers 78 Series High Build Epoxy-Valspar Amercoat 395 (white)-Ameron Cook Coal Tar Epoxy 920-B-950 Inorganic Coatings, Inc. P29 Coal Tar Epoxy
13.	10	Submerged Steel or Iron	Coal Tar Epoxy Two Component	300-M-Koppers 578-J-1 High Build Coal Tar Epoxy-Valspar Amercoat 330-Ameron Cook Coal Tar Epoxy 920-B-950 Inorganic Coatings, Inc. P29 Coal Tar Epoxy
14.	16	Buried Steel or Iron	Tar Base Pitch	Bitumastic No. 50-Koppers

				35-J-10 High Build Bituminous Coating Valspar
15.	0.4	Galvanized metal primer	Vinyl Wash Primer	40 Passivator-Koppers 13-Y-8 Val-Chem Vinyl Wash Primer-Valspar Amercoat 178 Inorganic Coatings, Inc. B11 Wash Primer Cook 900-Y-002 Vinyl Wash Primer
16.	3.0	Steel Above Ground and Above Water-line	High Ratio Silicate Inorganic Zinc	Inorganic Coatings, Inc. IC531 Dupont 347 WB Inorganic Zinc Devoe-Napko Zinc Prime 9Z
17.	2.5	Steel Interior Interior	Polyamide Cured Epoxy Resin	Inorganic Coatings, Inc. P24 Epoxy Dupont Corlar 823 Devoe-Napko 545 Epoxy
18.	2.0	Intermediate Finish	Epoxy Primer	Inorganic Coatings, Inc. P21 Epoxy Dupont Corlar 823 Devoe-Napko Chemfast 545 Buff

* Or manufacturer's standard, whichever is greater.
Do not exceed manufacturer's maximum standard, if applicable.
** For potable water use.

There are line code(s), description(s), and unit(s) for this item.

END OF ITEM 447