CANYON LAKE WATER SERVICE COMPANY

FACILITY AND ASSET PAINTING AND COATING

MAY 20, 2015

PART 1 GENERAL

1.1 DESCRIPTION

A. The purpose of this specification is to establish methods and procedures for coating and painting.

B. The work covered by this section includes furnishing all labor, materials, and equipment required to accomplish all painting as specified herein and shown on the Drawings.

1.2 SCOPE OF WORK

A. In general, work included under this section shall include the surface preparation, shop priming, field priming, and/or field painting of all exposed items and surfaces throughout the project, unless otherwise indicated.

B. All exposed items and surfaces shall be painted using the appropriate paint system as specified herein. Coating system schedules and finish schedules may be provided herein and/or on the Drawings, which identify specific paint systems and paint colors to be used on specific items and surfaces. However, these schedules do not necessarily cover all items to be painted. Where the selection of a specific painting system for a particular application is not clear, it shall be the responsibility of the Contractor to request clarification from the Engineer.

C. Surface preparation, priming, and coats of paint specified are in addition to shop priming and surface pretreatment specified in other sections, unless otherwise indicated.

D. All exposed surfaces shall be painted except where the natural finish of the material is obviously intended to be the finished surface or if the surface is specifically noted not to be painted.

E. In general, and unless otherwise specifically noted in both the drawings and these specifications, items to be painted include:
   1. All exposed exterior surfaces including:
      a. Concrete masonry units, excepting split face CMU.
      b. Equipment supports.
      c. Pipe, valves, fittings, hydrants, and appurtenances.
      d. Ductwork and appurtenances.
      e. Non-galvanized conduit and appurtenances.
      f. Interior and exterior surfaces of ferrous metal tankage.
      g. Ferrous metals.
      h. All factory primed steel doors and equipment.
      i. Exposed untreated wood.
      j. All other surfaces subject to corrosion.

2. All exposed interior surfaces including:
    a. All wall surfaces in all spaces unless specifically noted not to be painted.
    b. All columns, equipment pads, pipe supports, and appurtenances.
    c. Pipe, valves, fittings, hydrants, and appurtenances.
    d. Ductwork and appurtenances.
    e. All electrical conduit unless specifically noted not to be painted.
    f. All hangers and supports for overhead items.
    g. Ferrous metals.
    h. All factory primed steel doors and equipment.
    i. Exposed untreated wood.
    j. All other surfaces subject to corrosion.
    k. All interior surfaces of wet wells, headworks channels, screen channels, grit removal channels, vortex structure, and chemical containment structures.
3. Equipment that does not have an approved final coat or does not have the appropriate finished color as directed by the Engineer.
4. Interior of pump station wet wells.
5. Touch up all equipment that has been damaged by the existing construction as directed by the Engineer.
6. Touch up all existing or new items and surfaces damaged by construction as directed by the Engineer.

F. In general, items NOT to be painted include:
1. Items with Engineer approved factory finish.
2. Electrical equipment unless specifically noted.
3. Surfaces hidden from view including piping, conduit, ducts, and insulation. Note, the manufacturers standard coatings, if any, may remain.
4. Stainless steel surfaces.
5. Aluminum surfaces except:
    a. Where specifically noted to be painted.
    b. Where embedded in or in contact with concrete.
    c. Where in contact with dissimilar metals.
    d. Piping or tubing.
6. Fiberglass surfaces except piping and piping appurtenances.
7. Interior of pipe, ductwork, and conduits.
8. Moving parts of mechanical and electrical units where painting would interfere with the operation of the unit.
9. Code labels and equipment identification and rating plates.
10. Exterior concrete or pre-cast concrete surfaces.
11. Galvanized metal surfaces except interior conduit.
12. Face brick, ceramic tile, plastic laminate.
13. Concealed deck except where specifically specified to be painted.
14. Pre-finished metal.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)
1. ASTM D 4258 Standard Practice for Cleaning Concrete
2. ASTM D 4259 Standard Practice for Abrading Concrete
3. ASTM D 4260 Standard Practice for Acid Etching Concrete
4. ASTM D 4261 Standard Practice for Surface Cleaning Concrete Masonry Unit

5. ASTM D 4262 Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces
6. ASTM D 4263 Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
7. ASTM D 4285 Standard Test Method for Indicating Oil or Water in Compressed Air
8. ASTM F 1869 – Calcium Chloride Test to Quantify Moisture in Concrete

B. National Association of Corrosion Engineers (NACE International)
1. NACE 6G191 - Surface Preparation of Contaminated Concrete for Corrosion Control
2. RPO 188- Discontinuity (Holiday) Testing of Protective Coatings

C. National Association of Pipe Fabricators (NAPF)
1. NAPF 500- Surface Preparation Standard for Ductile Iron Pipe and Fittings

D. NSF International (NSF)
1. NSF 61 – Drinking Water System Components-Health Effects

E. Society for Protective Coatings (SSPC)
1. SSPC- SP1- Solvent Cleaning
2. SSPC-SP2- Hand Tool Cleaning
3. SSPC-SP3- Power Tool Cleaning
4. SSPC-SP5- White Metal Blast Cleaning
5. SSPC-SP6- Commercial Blast Cleaning
6. SSPC-SP7- Brush Off Blast Cleaning
7. SSPC-SP10- Near White Blast Cleaning
8. SSPC-SP11- Power Tool Cleaning to Bare Metal
9. SSPC-SP12- Surface Preparation and Cleaning of Metals by Water jetting

F. Underwriters' Laboratory (UL)
1. 3P83 Drinking Water System Components- Health Effects

G. Joint Standard of SSPC and NACE
1. SSPC-SP 13 / NACE No. 6 – Surface Preparation of Concrete

H. OSHA, NFPA, AWWA, and TCEQ

1.4 DEFINITIONS

A. Definitions of Painting Terms: ASTM D16, unless otherwise specified.

B. Dry Film Thickness (DFT): Thickness of a coat of paint in fully cured state measured in mils (1/1000 inch).

C. Submerged Metal: Steel or iron surfaces below tops of channel or structural walls which will contain water even when above expected water level.

D. Submerged Concrete and Masonry Surfaces: Surfaces which are or will be :
1. Underwater
2. In structures which normally contain water.
3. Below tops of walls of water containing structures.

E. Exposed Surface: Any metal or concrete surface, indoors or outdoors that is exposed to view and environment.

F. Volatile Organic Compound (VOC): Content of air polluting hydrocarbons in uncured coating product measured in units of grams per liter or pounds per gallon as determined by EPA Method 24

G. Ferrous: Cast iron, ductile iron, wrought iron, and all steel alloys except stainless steel.

H. Where SSPC surface preparation standards are specified or implied for ductile iron pipe or fittings, the equivalent NAPF surface preparation standard shall be substituted for the SSPC standard.

1.5 SUBMITTALS

A. The Contractor shall submit shop drawings and product data to the Engineer in accordance with the requirements of the section titled "Submittals" of these specifications.

B. At a minimum, the submittals shall contain, but not be limited to, the following information to establish compliance with these specifications:
   1. Product Data
      a. Submit Manufacturer's product data for each coating, including generic description, complete technical data, surface preparation, and application instructions.
   2. Color Samples
      a. Submit Manufacturer's color samples showing full range of standard colors.
   3. Manufacturer's Quality Assurance
      a. Submit Manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.
      b. Submit Manufactures sample warranty of no less than 10 years shall be provided prior to start of project.
      c. Submit Manufactures final project warranty of no less than 10 years.

   4. Applicator's Quality Assurance
      a. Submit list of a minimum of 5 completed projects of similar size and complexity to this work. Include for each project:
      b. Project name and location.
      c. Name of Owner.
      d. Name of Contractor.
      e. Name of Engineer.
      f. Name of coating manufacturer.
      g. Approximate area of coatings applied.
      h. Date of completion.
   5. Warranty
      a. Submit a complete description of the warranty to be provided by both the Manufacture and Applicator.
   6. Painting Schedule
      a. Contractor shall submit a schedule of all items (structures, equipment, pipe, etc.) to be painted prior to beginning painting operations. Schedule shall include, but not be limited to, items to be painted, surface preparation, paint system, and color. The schedule shall be submitted to the Engineer for approval at which time the Engineer will select the colors to be used that are not specified herein or on the Drawings.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications
   1. Specialize in manufacture of coatings with a minimum of 10 years successful experience.
   2. Able to demonstrate successful performance on comparable projects.
   3. Single Source Responsibility
   4. Coatings and coating application accessories shall be products of a single manufacturer.

B. Applicator's Qualifications
   1. Experienced in application of specified coatings for a minimum of 5 years on projects of similar size and complexity to this work.
   2. Applicator's Personnel
      a. Employ persons trained for application of specified coatings.

C. Mock-Ups
   1. Prepare 10 foot x 10 foot mock-up for each coating system specified using same materials, tools, equipment, and procedures intended for actual surface preparation and application. Obtain Engineer's approval of mock-ups. Retain mock-ups to establish intended standards by which coating systems will be judged.
   2. Mock-up may be part of finished product

D. Pre-application Meeting
   1. Convene a pre-application meeting two (2) week(s) before start of application of coating systems. Attendance of parties directly affecting work of this section, including Contractor, Engineer, Applicator, and Manufacturer's representative, is required. The meeting shall cover, but not be limited to, the following:
      a. Environmental requirements.
      b. Protection of surfaces not scheduled to be coated.
      c. Surface preparation.
      d. Application.
      e. Disinfection.
      f. Repair.
      g. Field quality control.
      h. Cleaning.
      i. Protection of coating systems.
      j. One-year inspection.
      k. Coordination with other work.

E. Manufacturer's Representative During Painting Operations
   1. An authorized Manufacturer's representative shall be present at the start-up and weekly during painting operations. Such representative shall instruct and observe the Contractors and Applicators work and shall, at the completion of work, certify in writing to the Engineer that the Manufacturer's application recommendations have been adhered to. The cost of this work shall be borne by the Contractor.

F. Field Quality Control
   1. Surface preparation shall be based upon comparison with "Pictorial Surface Preparation Standards for Painting Steel Surfaces: SSPC-VIS 1", ASTM Designation D2200, "Standard Methods of Evaluating Degree of Rusting on Painted Surfaces", ASTM D 4417, Method A and/or Method C or NACE Standard RP0287, and ASTM Designation

D610 “Visual Standard for Surfaces of New Steel Air Blast Cleaned with Sand Abrasive". In all cases the written standard shall take precedence over the visual standard.

2. NACE Standard RP0178-91, along with the Visual Comparator, shall be used to verify the surface preparation of welds.
3. Check thickness of coatings with a non-destructive, magnetic-type thickness gauge, as per SSPC-PA 2 “Measurement of Dry Film Thickness with Magnetic Gages”. References in PA 2 which allow 80% of the minimum thickness specified are not acceptable. Use an instrument such as a Tooke Gauge if the Engineer deems a destructive test necessary.
4. The integrity of interior coated surfaces shall be checked with a holiday detector in accordance with NACE Standard RP0188. Non-destructive holiday detector shall not exceed 67.5 volts, nor shall destructive holiday detector exceed the voltage recommended by the manufacturer of the coating system. A solution of 1-ounce non-sudsing type wetting agent, such as Kodak Photo-Flo, and 1 gallon of tap water shall be used to perform the holiday testing. All pinholes and/or holidays shall be marked and repaired in accordance with the manufacturer's printed recommendations and retested. No pinholes or other irregularities will be permitted in the final coating.
5. Furnish in good working condition the following inspection devices for detection of holidays and measurement of dry film thicknesses of coatings by the Engineer or his representative:
    1. U.S. Department of Commerce, National Bureau of Standards certified thickness calibration plates and/or plastic shims, depending upon the thickness gauge used, to test the accuracy of dry film thickness gauges.
    2. Certified instrumentation to test the accuracy of holiday detectors.
    3. Dry film gauges and holiday detectors.
6. Measure the dew point using a Sling Psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychometric Tables.
7. All materials furnished and all work performed under the Contract shall be subject to inspection by the owner. The Contractor shall be held strictly to the true intent of the Specifications in regard to quality of materials, workmanship, and diligent execution of the Contract.
8. “Hold point’ inspections will be used for this project. The Engineer or his representative will inspect surfaces prior to abrasive blasting, after abrasive blasting but prior to application of coating materials, and between subsequent coats of material. Final inspection of coatings will take place prior to placing the tank in service. Provide rigging that will enable the Engineer or his representative to conduct the required inspections.
9. Work performed in the absence of prescribed inspection may be required to be removed and replaced under the proper inspection, and the entire cost of removal and replacement.
10. Contractor shall bear the entire cost of performing all the work and furnishing all the materials necessary for the removal of the covering and its subsequent replacement, as directed and approved by the owner.
11. The owner, or their authorized representative will make, or have made, such tests as deemed necessary to assure the work is being accomplished in accordance with the requirements of the Contract.
12. In the event such tests reveal noncompliance with the requirements of the Contract, the Contractor shall bear the cost of such corrective measures deemed necessary by the owner, as well as the cost of subsequent retesting.

G. Remedial Work

1. Any location where the coating has peeled, bubbled, cracked, or is of noncompliance with the coating specification shall be repaired in accordance with the manufactures written approved remediation.

H. Warranty
1. The Applicator shall provide a written warranty of no less than 10 years on workmanship. The extended warranty may include an acceptable prorated percentage of failure not to exceed 5% failure per year.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery
1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying:
a. Coating or material name.
b. Manufacturer.
c. Color name and number.
d. Batch or lot number.
e. Date of manufacture.
f. Mixing and thinning instructions.

B. Storage
1. Store materials in a clean dry area and within temperature range in accordance with Manufacturer's instructions.
2. Keep containers sealed until ready for use.
3. Do not use materials beyond Manufacturer's shelf life limits.

C. Handling
1. Protect materials during handling and application to prevent damage or contamination.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Weather
1. Air and Surface Temperatures
a. Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with Manufacturer's instructions.
2. Surface Temperature
a. Minimum of 5 degrees F (3 degrees C) above dew point.
3. Relative Humidity
a. Prepare surfaces and apply and cure coatings within relative humidity range in accordance with Manufacturer's instructions.
4. Precipitation
a. Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.
5. Wind
a. Do not spray coatings if wind velocity is above manufacturer's limit.

B. Ventilation
1. Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with AWWA D 102.

2. Provide fans, heating devices, dehumidifiers, or other means recommended by the coating manufacture to prevent formation of condensate or dew on the surface of substrate, coating between coats and within curing time following application of last coat.
3. Dehumidifiers for forced air during blast cleaning and coating application is Mandatory

C. Dust and Contaminants
1. Schedule coating work to avoid excessive dust and airborne contaminants.
2. Provide forced air and dust socks to remove dust and airborne contaminants.
3. Protect work areas from excessive dust and airborne contaminants during coating application and curing.

D. Abrasive Blast Cleaning
1. All surfaces to be abrasive blast cleaned shall be shrouded. The shrouding shall remain in place until the painting operation is complete. The shroud shall enclose or surround the area being blasted to minimize the atmospheric entrainment of fine particulates and direct that material to a confined area for disposal. The shroud shall have overlapping seams to prevent leakage of particulates, shall extend a minimum of 15 feet (15') above the area being blasted, and shall have a shade factor of 95 percent (95%) of a control factor of 95 percent (95%) of particles 100 grit or greater.

1.9 SAFETY AND HEALTH REQUIREMENTS

A. Contractors shall conform with safety requirements set forth by regulatory agencies applicable to the construction industry and manufacturer's printed instructions.

B. All ladders, scaffolding and rigging shall be designed for their intended uses. Ladders and scaffolding shall be erected to facilitate inspection and to be moved by the contractor to locations requested by the owner.

C. The contractor shall use all proper head and face protection and approved respiratory devices.

D. Blasting, spray and air hoses shall be grounded to prevent accumulation of charges of static electricity.

E. Spark proof artificial lighting shall be provided for all work in confined spaces.

F. The lighting fixtures and flexible cords shall comply with the requirements of NFPA 70.

G. When handling and mixing coating and paints, workers shall wear proper gloves and eye shields.

H. During mixing and application of the coating and paints, all flames, welding and smoking shall be prohibited in the vicinity. Appropriate fire extinguishers shall be provided by the contractor and be kept at the job site.

1.10 DISINFECTION

A. Disinfecting interior surfaces shall be performed in the presence of the owner in accordance with AWWA standards. C652-86 method 2

B. After testing has been completed and prior to the tank being placed into service, the chlorine residual shall not be less than 1.0mg/l nor greater than 2.0mg/l.

1.11 CLEAN UP

A. Upon completion of the work, all staging, scaffolding and containers shall be removed from the site. Paint spots upon adjacent surfaces shall be removed and the entire job site cleaned. All damage to surfaces resulting from the work of this section shall be cleaned, repaired or refinished to the satisfaction of the owner at no cost to the owner.

1.12 DISPOSAL OF HAZARDOUS WASTE

A. Materials, by their composition, that come within the category of a hazardous waste by virtue of ruling by Federal, State or County Regional Environmental Control Agencies within the framework of Federal and State Laws shall be disposed of in a manner prescribed by these rules and laws.

1.13 TESTING EQUIPMENT

A. The Contractor shall furnish and make available to the Engineer the following items of testing equipment for use in determining if requirements of this section are being satisfied. Specified items of equipment shall be available for the Engineer's use at all times when field painting or surface preparation is in progress.
   1. Wet film gauge.
   2. Surface thermometer.
   3. Keane-Tator surface profile comparator.
   4. Set of National Association of Corrosion Engineers (NACE) visual standards.
   5. Holiday (pin hole) detector (low voltage).
   6. Sling-psychrometer.
   7. Magnetic dry film gauge.

PART 2 GENERAL PAINTING AND MATERIAL

2.1 MANUFACTURERS

A. Approved manufacturers include:
   1. Carboline Co.

B. Product names and numbers specified herein have been selected. Equivalent materials produced by approved Manufacturer's shall be acceptable subject to prior review by the Engineer. Unless otherwise noted in the system charts, finish colors shall be as selected by Engineer from Manufacturer's standard colors.

C. The owner shall be sole and final judge of the acceptability of any proposed substitution. Requests for substitution must be approved in writing prior to date of bid.

D. Manufacture to provide a minimum 2 year warranty on the product.

2.2 PERFORMANCE REQUIREMENTS

A. Coating materials for concrete and metal surfaces shall be especially adapted for use in water treatment plants and/or wastewater treatment facilities.

B. Coating for final coats shall be fume resistant, compounded with pigment suitable for exposure to chlorine, ammonia, and hydrogen sulfide gasses.

C. Pigments shall be materials that do not darken, discolor, or fade due to action of chlorine, ammonia, and hydrogen sulfide gasses.

D. Coating materials used in conjunction with potable water supply systems shall be certified to NSF 61 or UL 3P83

2.3 MAINTENANCE

A. Extra Materials: Include minimum 1 gallon of each type and color of coating applied.
   1. When manufacture packages material in gallon cans, deliver unopened, labeled cans as comes from the factory.
   2. When manufacture does not package in gallon cans, deliver material in new gallon containers, properly sealed and identified with typed labels indicating brand, type, and color.

2.4 SURFACE PREPARATION

A. Solvent Cleaning. Remove heavy deposits of grease or oil from the surface prior to any other surface preparation. Neutralize and flush chemical contamination prior to any other surface preparation.

B. Grinding. Remove weld splatter and rough edges and grind rough welds to produce a surface that will allow proper adhesion. All surface defects such as gouges, pits, welding and torch-cut slag, welding flux and splatter, etc. shall be removed by mechanical means in accordance with SSPC-SP-3. All rough welds shall be ground smooth and all sharp edges shall have a radius of $\frac{1}{8}$-inch ($\frac{1}{8}$") minimum. Gouges and pits shall be filled with weld and ground smooth.

C. Abrasive Blast Cleaning.
   1. Use of source that provides compressed air, free of detrimental amounts of water and oil.
   2. Abrasive blast only the amount of surface area which can be primed the same day or before any rust starts to form, whichever occurs first. Areas which are not painted the same day must be reblasted on the day the prime coat is applied. Remove abrasive residue from the surface by brush or industrial vacuum.
   3. Abrasive blast surfaces to be coated, except those specified in the paragraph Power Tool Cleaning, to "near-white" metal in accordance with Steel Structures Painting Council Surface Preparation Specifications SSPC-SP 10-63T, Near White Cleaning. Remove mill scale, rust dirt, paint, or other foreign matter. The surface should be a uniform gray color and slightly roughened to form a suitable anchor pattern for coating application. The surface profile should be approximately two (2) mils. At least 95 percent (95%) of each square inch of surface area must be free of visible residues and the remainder limited to light discoloration.

4. All surfaces shall be approved by a CLWSC represenative prior to any coating application. The standard of cleanliness for the surface preparation shall be evaluated with the use of SSPC Pictorial Surface Preparation Standards, SSPC-Vis.-1 and "Swedish Standards."
5. Only a non-silica abrasive blasting material shall be used.
6. The abrasive to be used shall be sharp, angular, properly graded, and brought to the job site in moisture proof bags or air tight bulk containers.
7. No cleaned surface shall receive a coating if "rust bloom" or discoloration has occurred.

D. Power Tool Cleaning. Clean pumps and motors to be coated in accordance with Steel Structures Painting Council Surface Preparation Specifications, SSPC-SP 3-63, Power Tool Cleaning, removing loose mill scale, loose rust, loose paint, and other foreign matter.

E. Metalwork. Do not shop prime any metal work unless prior approval is given by the Engineer in writing. The field project representative will make an inspection of any shop primed metal at the factory.

F. Surface Preparation Detail at end of section

2.5 COATING APPLICATION

A. Manufacturer's Representative. The coating manufacturer will be responsible, through an authorized representative, to provide technical assistance to the paint contractor as needed.

B. Workmen. Employ workmen skilled in structural steel painting.

C. Materials.
1. Coating materials, abrasives, and equipment used in painting and cleaning are subject to inspection at any time by the Engineer or his representative. Materials shall be delivered to the site for inspection prior to beginning work.
2. Remove blasting abrasive and dust from the surface to be painted before paint application is begun.
3. If caulking is required, use an epoxy caulk which is flexible, suitable for use in contact with chlorinated potable water and compatible with the epoxy lining system used in the tank. Caulk will be two (2) component, polyamine or polyamide cured and 100 percent (100%) solids. Coatings manufacturer shall confirm in writing that their epoxy lining system is compatible with the proposed caulk. Any conditions for the epoxy caulk (including surface preparation requirements) shall be included in this transmittal.

D. Paint Coating Methods.
1. Spray painting is required. Small areas may be touched-up with a brush or roller only with prior approval by the Engineer.
2. Double coat welds by hand brushing between the first and second coat. Use a color which is different than the first coat. Hand brush all areas where clips attach and spray paint won't reach properly.
3. Coat areas with a uniform film, free of sags, runs, or brushmarks. Where multiple coats of paint are specified, apply each coat in a different shade than the preceding coat. Each coat must be free of shadows and uniform in appearance.
4. Except where otherwise specified, thin paint only as necessary for workability of coating material in accordance with manufacturer's printed instructions. Use only an appropriate thinner.

5. When paint is being applied to interior confined space, provide adequate ventilation.
6. Carefully observe minimum drying time between coats as stated in printed instructions of the coating manufacturer.
7. Provide a suitable cover or plug for the intake pipe at the point where the pipe enters the water compartment to prevent sand, debris, or any other foreign matter from entering the water mains. Leave the cover or plug in place from beginning of the job until just prior to filling the tank for disinfection.
8. Blasting abrasive may be left on the tank floor while painting the ceiling and walls provided no paint is applied to the walls within two (2) feet of the floor. The remaining two (2) feet of wall and the floor may be painted after removal of blasting abrasive from interior.
9. Comply with recommendations of the paint manufacturer in regard to drying time for each coat, technique of spray application, ventilation, paint thinning, and safety precautions. The Contractor must fully inform all members of his field crew of these recommendations.
10. Where inspection shows that the specified thickness is not developed, apply additional coats to produce the required film thickness.
11. Repair and re-coat improper applications as recommended by the manufacturer or as required by the Engineer.
12. Do not coat pump and motor name tags, meter and gauge sight glasses, valve operator stems or other items designated by the Engineer.
13. Each coat of paint shall be allowed to either dry or cure for the amount of time recommended by the coating manufacturer before successive coats of paint are applied. All successive coats of paint shall be applied within the recoat threshold time as recommended by the coating manufacturer.

E. Protection of Surfaces.
1. Contractor shall protect all surfaces which are not to be painted from spray painting, overspray, splatters, paint spills, and any extraneous material from abrasive blast.
2. Contractor shall protect from damage adjacent property, nearby persons, and vehicle traffic.
3. Contractor shall be responsible for and shall correct and/or repair all damage resulting from all members of his field crew.

F. Site Cleanup.
1. The project site shall be left neat and clean to the Owner's satisfaction each day with all catalyzed and waste material discarded daily.
2. Upon completion of the work, Contractor shall remove all trash, rubbish, waste, paint cans, staging, scaffolding, and blasting materials. Such materials become the property of the Contractor and must be disposed of in accordance with appropriate governmental regulations at the expense of the Contractor. Contractor shall remove all paint spots, oil, and/or stains spilled or blown on adjacent surfaces at Contractor's expense. Entire project site must be clean and acceptable to Owner.
3. Use only compatible solvents recommended by coating manufacturer for cleaning.

2.17 SURFACE PREPARATION DETAIL

A. SURFACE PREPARATION OF STEEL
1. Prepare steel surfaces in accordance with Manufacturer’s instructions.
2. Fabrication Defects

a. Correct steel and fabrication defects revealed by surface preparation.
b. Remove weld spatter and slag.
c. Round sharp edges and corners of welds to a smooth contour.
d. Smooth weld undercuts and recesses.
e. Grind down porous welds to pinhole-free metal.
f. Remove weld flux from surface.

3. Ensure surfaces are dry.
4. Immersed or Below Grade Surfaces
   a. Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 10/NACE 2.
5. Exterior Exposed or Interior Exposed Surfaces
   a. Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 6/NACE 3.
6. Interior or Immersed Surfaces, Severe Atmospheres
   a. Remove visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter in accordance with SSPC-SP 5/NACE 1.
7. Abrasive Blast-Cleaned Surfaces
   a. Coat abrasive blast-cleaned surfaces with primer before visible rust forms on surface. Do not leave blast-cleaned surfaces uncoated for more than 8 hours.
8. Shop Primer
   a. Prepare shop primer to receive field coat in accordance with manufacturer's instructions.

B. SURFACE PREPARATION OF GALVANIZED STEEL AND NONFERROUS METAL
1. Prepare galvanized steel and nonferrous metal surfaces in accordance with Manufacturer's instructions.
2. Ensure surfaces are dry.
3. Remove visible oil, grease, dirt, dust, protective mill coatings, and other soluble contaminants in accordance with SSPC-SP 1 or Manufacturer's instructions as specified for coating system.
4. Immersed Service
   a. Clean surfaces by abrasive blasting.
5. Remove Rust From Galvanized Steel
   a. Remove white rust from galvanized steel by hand or power brushing.
   b. Remove rust from old galvanized steel in accordance with SSPC-SP 2 or SP 3.
   c. Do not damage or remove galvanizing.
6. Increase mechanical adhesion under moderate to severe conditions, such as exterior exposure or chemical environments, by abrasive blast and/or chemical cleaning.

C. SURFACE PREPARATION OF DUCTILE OR CAST IRON
1. Prepare ductile or cast iron surfaces in accordance with Manufacturer's instructions.
2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

D. SURFACE PREPARATION OF PVC/CPVC
1. Prepare PVC/CPVC surfaces in accordance with Manufacturer's instructions.
2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
3. Scarify PVC/CPVC surfaces.

E. SURFACE PREPARATION OF INSULATED PIPE
1. Prepare insulated pipe surfaces in accordance with Manufacturer's instructions.
2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

F. SURFACE PREPARATION OF CONCRETE
   1. Exterior
      a. Prepare concrete surfaces in accordance with Manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
      b. Allow concrete to cure for a minimum of 14 days.
      c. Test concrete for moisture in accordance with ASTM D 4263 and F 1869.
      d. Level concrete protrusions and mortar spatter.
      e. Fill hairline cracks less than 1/64 inch (0.4 mm) in accordance with Manufacturer's instructions.
      f. Prepare cracks wider than 1/64 inch (0.4 mm), moving cracks, gaps, and expansion joints in accordance with Manufacturer's instructions.
      g. Ensure surfaces are clean, dry, and free of oil, grease, chalk, form release agents, and other contaminants.

G. SURFACE PREPARATION OF CONCRETE FLOORS
   1. Prepare concrete surfaces in accordance with Manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
   2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
   3. Allow concrete to cure for a minimum of 28 days before coating.
   4. Test concrete for moisture in accordance with ASTM D 4263 and F 1869.

H. SURFACE PREPARATION OF SECONDARY CONTAINMENT
   1. Prepare secondary containment surfaces in accordance with Manufacturer's instructions.
   2. Prepare concrete surfaces in accordance with Manufacturer's instructions, SSPC-SP 13/NACE 6, and ICRI 03732.
   3. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
   4. Allow concrete to cure for a minimum of 28 days before coating.
   5. Surface shall be dry and dust free before coating application.
   6. Test concrete for moisture in accordance with ASTM D 4263 and F 1869.

I. SURFACE PREPARATION OF CONCRETE MASONRY UNITS
   1. Prepare porous concrete masonry unit surfaces in accordance with Manufacturer's instructions and SSPC-SP 13/NACE 6.
   2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
   3. Allow mortar to cure for a minimum of 28 days before coating.
   4. Level protrusions and mortar spatter.

J. SURFACE PREPARATION OF PLASTER
   1. Prepare plaster surfaces in accordance with Manufacturer's instructions.
   2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
   3. Allow plaster to cure and dry out for a minimum of 28 days before coating.
   4. Do not coat over plaster containing free water, lime, or other soluble alkaline salts.
   5. Remove plaster nibs and other protrusions.
   6. Patch voids and cracks with approved materials and after dry, sand flush with surface.

K. SURFACE PREPARATION OF GYPSUM BOARD
   1. Prepare gypsum board surfaces in accordance with Manufacturer's instructions.
   2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.
   3. Sand joint compound smooth and feather edge.
   4. Avoid heavy sanding of adjacent gypsum board surfaces, which will raise nap of paper covering.

5. Do not apply putty, patching pencils, caulking, or masking tape to drywall surfaces to be painted.
6. Lightly scuff-sand tape joints after priming to remove raised paper nap. Do not sand through primer.

L. SURFACE PREPARATION OF WOOD
1. Prepare wood surfaces in accordance with Manufacturer's instructions.
2. Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, surface deposits of sap or pitch, and other contaminants.
3. Seal knots and pitch pockets.
4. Sand rough spots with the grain.
5. Fill cracks and holes with approved materials after primer is dry. Sand flush with surface when filler is hard.
6. Lightly sand between coats.

Pre Approved Products

Interior Lining
Reactimine 760 as supplied by Carboline Co.
Plasite 4500/ 4500s

Exterior Coating
Prime Coat:
Carboguard 60 as supplied by Carboline Co.

Top Coat:
Carbothane 134 HG as supplied by Carboline Co.