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DEPARTMENT OF THE NAVY  
NAVAL FACILITIES  
ENGINEERING COMMAND  
GUIDE SPECIFICATION

NFGS-09971E

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Superseding NFGS-09971D (09/99)

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SECTION 09971

EXTERIOR COATING OF STEEL STRUCTURES (Navy & AF)  
07/00

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NOTE: This guide specification covers the requirements for zinc-rich epoxy/epoxy/polyurethane coating systems for exteriors of new Navy and Air Force steel structures, such as fuel tanks, water tanks, aboveground piping, etc. For maintenance coating design, see notes herein. Severe corrosion and corrosion pitting is not addressed in this specification.

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NOTE: This revision "E" to NFGS-09971 follows a complete review of the previous version, and has been renamed to reflect a wider scope. The text is revised throughout, according to that review.

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NOTE: this specification previously referred to fuel tanks only, however, it has been modified for general use on steel structures, or miscellaneous steel appurtenances, in atmospheric service (non-immersion). This includes fuel tanks, water tanks, aboveground piping, cranes, towers, etc. It is also suitable for enclosed or exposed structural steel in buildings such as hangars, acoustical enclosures, or other facilities where a high-performance coating system is desired. This coating system is ideal for repairing and coating of galvanized surfaces. Repair galvanizing with the zinc-rich primer, and apply general coats of intermediate and topcoat to all surfaces.

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NOTE: This specification should be edited by personnel familiar with protective coatings and coating specifications. Completion of SSPC Course "C-1" Fundamentals of Protective Coatings For Industrial Structures," or equivalent, is considered a minimal qualification, along with appropriate specification writing experience.

## 2.4 COATING SAMPLE COLLECTION AND SHIPPING KIT

Provide a kit that contains one liter quart can for the base of each coating material, an appropriately sized can for each activator, dipping cups for each component to be sampled, a shipping box sized for the samples to be shipped, and packing material. Mark cans for the appropriate component. Provide shipping documents, including either pre-paid shipping or a shipper number that can be used by the Contracting Officer to arrange pickup, addressed to the approved coating testing laboratory.

## 2.5 ABRASIVE SAMPLE COLLECTION AND SHIPPING KIT

Provide a kit that contains one suitable plastic bag or container for each sample to be collected. Mark container for the appropriate component. Provide shipping documents, including either pre-paid shipping or a shipper number that can be used by the Contracting Officer to arrange pickup, addressed to the approved coating testing laboratory.

## 2.6 SOLUBLE SALTS TEST KITS

### 2.6.1 Test Kit for Measuring Chlorides on Steel Surfaces

Provide test kits called CHLOR\*TEST, as manufactured by CHLOR\*RID International Inc. of Chandler, Arizona ([www.chlor-rid.com](http://www.chlor-rid.com)) or equal. An "equal" test kit shall meet the following requirements:

- a. Kit contains all material, supplies, tools and instructions for field testing and on-site quantitative evaluation;
- b. Kit extract solution is acidic, factory pre-measured, pre-packaged, and of uniform concentration;
- c. Kit components and solutions are mercury free and environmentally friendly;
- d. Kit contains a factory sealed titration device;
- e. Kit contains new material and solutions for each test;
- f. Test container (vessel, sleeve, cell. etc) creates a sealed encapsulated environment during chloride ion extraction.
- g. Test container is suitable for testing the following steel surfaces: horizontal (up/down configuration), vertical, flat, curved, smooth, pitted, and rough.
- h. Kit uses test container, with resulting chloride ion extract solution, as in the titration container;
- i. Chloride ion concentration is directly measured in micrograms per square centimeter without using either conversion charts or tables.

## 2.7 ABRASIVE MEDIA

The referenced abrasive specifications have maximum limits for soluble salts contamination, however, this maximum level of contamination does not guarantee that contamination will not be transferred to the steel surface.

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**Class 4 requires minimal “knockdown” of airborne debris,  
and is not generally usable as an airborne particulate control measure.**

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The contractor shall design and provide a containment system for the capture, containment, collection, storage and disposal of the waste materials generated by the work under this specification section, to meet the requirements of SSPC Guide 6, Class [1] [2] [3] [4]. Waste materials covered by this paragraph shall not include any material or residue from removal of coatings containing lead, chromium, cadmium, PCB, or any other hazardous material. It is the contractors responsibility to insure the feasibility and workability of the containment system. The contractor shall perform his operations and work schedule in a manner as to minimize leakage of the containment system.

The containment system shall be properly maintained and shall not deviate from the approved drawings, without the Contracting Officers approval. If at any time during the execution of the work, the containment system fails to function satisfactory in the opinion of the Contracting Officer, the contractor shall suspend all operations, except those required to minimize adverse impact on the environment or government property. Operations shall not resume until modifications have been made to correct the cause of the failure. Modifications shall be approved by the Contracting Officer. ]

### 3.6 SURFACE PREPARATION

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**NOTE: When editing this specification for maintenance coating work for which SSPC SP 12 Water Cleaning or Jetting surface preparation is to be allowed, include note for the contractor to use potable water, monitor the quality of the water, and adjust water quality to assure appropriate surface preparation and final surface requirements. There are many problems that might arise from both dissolved and suspended material. A common occurrence is water with high-chlorides, even in potable water, which may leave unacceptable contamination on cleaned surfaces, and may not be suitable for water jetting.**

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#### 3.6.1 Abrasive Blasting Equipment

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Use abrasive blasting equipment of conventional air, force-feed, or pressure type. Maintain a minimum pressure of 650 kPa 95 psig at nozzle. Confirm that air supply for abrasive blasting is free of oil and moisture as tested in accordance with ASTM D 4285. Test air quality at each startup, but in no case less than every five operating hours.

#### 3.6.2 Surface Standard

Inspect surfaces to be coated, and select plate with similar properties and surface characteristics for use as a surface standard. Blast clean one or more 300 mm 1 foot square steel panels as specified in Article entitled “Surface Preparation.” Record blast nozzle type and size, air pressure at nozzle and compressor, distance of nozzle from panel, and angle of blast to establish procedures for blast cleaning. Measure surface profile in accordance with ASTM D 4417. When the surface standard complies with all specified requirements, seal with clearcoat protectant.

Use the surface standard for comparison to abrasive blasted surfaces throughout the course of work.

3.6.3 Pre-Preparation Testing for Surface Contamination

Perform testing, abrasive blasting, and testing in the prescribed order.

3.6.3.1 Pre-Preparation Testing for Oil and Grease Contamination

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**NOTE: When specifying maintenance painting, use a water based pH neutral degreaser to avoid damaging existing coating.**

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Ensure surfaces are oil-free by visual examination. Check entire structure with water misted onto surface. Any beading of water is indication of oil or grease contamination. Clean contaminated surfaces [using a water based pH neutral degreaser] in accordance with SSPC SP 1 and recheck for contamination until surfaces are free of oil and grease.

3.6.3.2 Pre-Preparation Testing for Soluble Salts Contamination

Test surfaces for soluble salts, and wash as required, prior to abrasive blasting. Soluble salt testing is also required in Article entitled “Pre-Application Testing for Soluble Salts Contamination” as a final acceptance test of prepared surfaces after abrasive blasting, and successful completion of this phase does not negate that requirement. This phase is recommended since pre-preparation testing and washing are generally more advantageous than attempting to remove soluble salt contamination after abrasive blasting. Effective removal of soluble salts will require removal of any barrier to the steel surface, including rust. This procedure may necessitate combination of wet abrasive blasting, high pressure water rinsing, and cleaning using a solution of water washing and soluble salts remover. The soluble salts remover shall be biodegradable, nontoxic, noncorrosive, and after application, will not interfere with primer adhesion. Delays between testing and preparation, or testing and coating application may allow for the formation of new contamination. Use potable water, or potable water modified with soluble salt remover, for all washing or wet abrasive blasting. Test methods and equipment used in this phase are selected at the Contractor’s discretion.

3.6.4 Abrasive Blasting

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**NOTE: The specified 2-3 mil surface profile is the preferred depth for preparing for zinc primer. On steel that was previously prepared to a deeper depth and coated, it is not feasible to reduce the deeper depth. A depth of 4 mils can be tolerated with an additional mil of zinc primer thickness. To validate contractor claims of pre-existing profile greater than allowed, test an appropriate number of representative spots with abrasive that removes paint but does not affect profile, such as bicarbonate of soda, or other soft abrasive, or waterblasting, etc.**

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Abrasive blast steel surfaces to white metal in accordance with SSPC SP5. Prepared surfaces shall conform to SSPC VIS 1 and SSPC Guide to VIS 1 and shall match the prepared test-panels. Provide a 50 to 75 micron 2 to 3 mil surface profile. Surface profile greater than 75 microns 3 mils will not be accepted. Measure surface profile in accordance with ASTM D 4417. Measure profile at rate of three tests for the first 100 square meters 1000 square feet plus one test for each additional 100 square meters 1000 square feet or part thereof. Provide two additional measurements for each non-compliant measurement. When surfaces are reblasted for any reason, retest profile as specified. If Method C of ASTM D 4417 is used to measure profile, attach test tapes to Daily Inspection Reports. Following abrasive blasting, remove dust and debris by brushing, blowing with oil-free and moisture-free compressed air, or vacuum cleaning. Time interval between abrasive blasting and application of primer shall not exceed eight hours.

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3.6.5 Disposal of Used Abrasive

Dispose of used abrasive of f Government property in accordance with Federal, State, and Local mandated regulations.

3.6.6 Pre-Application Testing for Surface Contamination

3.6.6.1 Pre-Application Testing for Oil and Grease Contamination

Ensure tank surfaces are free of contamination as described in Article entitled “Pre-Preparation Testing for Oil and Grease Contamination”, except that only questionable areas need be checked for beading of water misted onto surface.

3.6.6.2 Pre-Application Testing for Soluble Salts Contamination

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**NOTE: On new structures, require 30% of tests  
to be accomplished at welds. On structures that have been  
in service, corroded areas should also be tested for high chlorides.**

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Test surfaces for chloride contamination using the Test Kit described in article entitled “Test Kit” for Measuring Chlorides on Steel Surfaces.” Test all surfaces at rate of three tests for the first 100 square meters 1000 square feet or part thereof. [Concentrate testing of bare steel at areas of coating failure to bare steel and areas of corrosion pitting.] [Perform 30% of tests on bare steel at welds, divide equally between horizontal and vertical welds.] One or more readings greater than 5 micrograms per square centimeter of chlorides shall be cause for rejection of surface. Wash all surfaces as discussed in article entitled “Pre-Preparation Testing for Soluble Salts Contamination,” allow to dry, and re-test until all required tests show allowable results. Reblast tested and cleaned areas as required. Label all test tubes and retain for test verification.



# STATE OF ILLINOIS

## SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction", adopted January 1, 1997, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highway, and the \*Manual of Test Procedures for Materiel in effect on the date of Invitation for bids, and the Supplemental Specifications and Recurring Special Provisions Indicated on the Check Sheet included herein which apply to and govern the construction of FAP Route 693 (IL 9). Section 12(B)I. in Peoria & Tazewell Counties. and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

### **Location of Project**

McNaughton Bridge carrying IL Route 9 over the Illinois River at Pekin.

### **Description of Project**

Rehabilitation of the McNaughton Bridge including resurfacing of the main river span's deck (involves removal of existing bituminous concrete wearing surface. blast clean preparation and metalizing of steel orthotropic deck plate, and placement of composite steel-fiber-reinforced concrete deck), modifications to the approach span's deck and miscellaneous modifications associated with the preceding. Also includes replacement of modular expansion joint.

### **Bridge Wearing Surface Removal (2-31411)**

This work shall consist of removal of the existing bituminous concrete wearing surface in preparation for blast cleaning the steel orthotropic deck plate. This work is intended to remove only the existing bituminous concrete; the removal of all other existing layers of materials as shown in the plans (see Sheet Number 6 of plans) shall be removed according to the blast cleaning steel deck plate special provision. In areas of the bridge where removal of the existing bituminous concrete is difficult, the Contractor has the option to complete the wearing surface removal in these areas according to the procedures specified in the blast cleaning steel deck plate special provision.

### **Equipment:**

The equipment used shall be subject to the approval of the Engineer and shall comply with the applicable portions of Section 1100 of the Standard Specifications and the following:

6. least 5°F greater than the dew point temperature of the surrounding air. Metallizing Contractor shall provide a daily log documenting the atmospheric dew point and the surface temperature of the steel for each shift to the Engineer.

### **7. Abrasives shall conform to the following :**

- a) For each new shipment of abrasive, a random sample shall be tested by the Metallizing Contractor for the presence of Ionic contamination by determining total concentrations of water-soluble Ionic contaminants in accordance with ASTM D4940 Standard Test Method for Conductometric Analysis of Water-Soluble Ionic Contamination of Blasting Abrasive".
- b) SSPC-ABI specifies that conductivity levels shall not exceed 1,000 microsiemens ( $\mu\text{S}$ ). Conductivity levels above 1,000  $\mu\text{S}$  will not be immediate cause for rejection of the abrasive, but conductivity test results will be used as a factor in determining whether the abrasive is contaminating the steel. The conductivity Instrument shall

be calibrated daily, using 700  $\mu\text{S}$  and 1413  $\mu\text{S}$  standard NaCl solutions that are NIST traceable. If the Metallizing Contractor and the Engineer determine that the abrasive is contaminating the steel, it shall be cause for rejection of the abrasive.

c) This test shall be performed on the abrasive work mix at the beginning of each work day that abrasive blast cleaning is scheduled, unless otherwise ordered by the Engineer. Refer to ASTM D4940 for approximate length of time involved with performing conductivity test

## **7. Reduction of Residual Chlorides and Sulfates**

- a) Chlorides, sulfates and other Ions are present on the surfaces of the existing organic coatings, primers, or bituminous sealers. Residual Ions are also on or lodged in the steel surfaces of the dock.
- b) In order to remove all traces of the chlorides and sulfates from the organic coatings or stool. high pressure or ultra-high pressure water jetting is specified, using Jetin Systems, Inc. equipment, or approved equivalent(s).
- c) A chloride and sulfate removal solution shall be added to water used for pressure jetting, and shall be applied in accordance with manufacturer recommendations, using Chlor\*Rid", solution or an approved equivalent.
- d) Upon completion of water jetting, representative areas Of ft stool dock plate, as directed by the Engineer, shall be tested for the presence of remaining chlorides and Sulfates. Testing shall be according to SSPC-TU4, using the Chlor\*Test<sup>tm</sup> or other approved equivalent test. A minimum of one residual Ion test sample per every 1,000 square treat shall be completed by the Metallizing Contractor
- e) If chlorides are detected at levels greater than  $10 \mu\text{g}/\text{cm}^2$  or sulfate levels greater than  $20 \mu\text{g}/\text{cm}^2$ , the affected areas shall be re-cleaned until acceptable results are achieved.
- f) Following successful chloride and sulfate testing and surface drying, the steel surface should be blasted with grit 10 meet the required surface preparation criteria.

## **8. Surface Profiling**

The existing organic coatings and all mill scale and rust shall be properly removed from both corroded & pitted and non-corroded surfaces in accordance with SSPC-SPIO Near-White Blast Cleaning with an angular surface profile of 2.5 - 5.0 mils. The angular profile measurements will be taken on smooth, non-pitted areas. The photographs of SSPC-Vis 1 should be used for comparison to define an acceptable final surface appearance. On surfaces with rust scale build-up, the rust scale shall be removed by power tool cleaning in accordance with SSPC-SP3 before obtaining a near-white metal surface finish. The Intent of these specifications is to decrease the number of surface anomalies and soluble Ion contaminants which could lead to corrosion In the future.

Some of the existing steel surfaces may be rough due to pitting. Surface profile measurements will be made In non-pitted areas, and will meet the 2.5 - 5.0 mil angular profile requirement. The profile depth shall be measured per ASTM D4417, Methods 9 and C. Localized grinding of " pitted steel may be required N pit depths exceed 250 mils. If areas containing excessive pitting are encountered, additional thickness of zinc metalizing will be required. Surface Profile measurements shall be sampled every 250 square feet maximum.

The Engineer, without notice, can inspect the work site to ensure that surface preparation and thermal spraying are being accomplished according to specifications. The Prime Contractor and the Metallizing Contractor are responsible that all pertinent environmental, health, and safety specifications are being observed and enforced.

**C. Abrasive Metering Valves and Solvent Restrictions**

1. Abrasive Metering Valves

- a) Prior to the start of abrasive blasting, the Metallizing Contractor shall demonstrate to the satisfaction of the Engineer that on each operating nozzle a metering valve is in place and is functioning properly. During blasting operations, each valve shall be adjusted so as to produce a minimum amount of abrasive and dust.
  - b) All metal surfaces to be coated shall receive a near-white metal blast cleaning as defined in SSPC-SP10/NACE-2.
  - c) The blast cleaned surfaces shall conform to SSPC-Vis 1. Additional hand and/or
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## Specification by SRP Utility Company

Any of the methods described in 6G 1 86 for detecting contaminated steel surfaces may be utilized as necessary by SRP inspectors. The procedure requiring white metal cleaning of the entire surface and subsequent rusting is not to be used since contamination of the entire surface is a known factor and decontamination of the entire surface is required. Spot tests with the Potassium Ferricyanide Test Paper will be used at any stage up to and including final surface preparation for cleanliness and surface profile as deemed necessary by SRP. Spot tests performed after final white metal blast cleaning will be cleaned by additional abrasive blast cleaning to white metal.

It is recommended that the contractor judiciously test typical and suspect areas using this test paper during various cleaning and decontamination stages in order to avoid re-work due to inadequate decontamination procedures or work.

DECONTAMINATION IS KNOWN TO BE SUBSTANTIALLY MORE LABOR INTENSIVE THAN JUST ABRASIVE BLAST CLEANING TO WHITE METAL. It is anticipated that the required inspection upon completion of the Initial Cleaning portion of the work will reveal the need for partial or total blast cleaning in preparation of effective decontamination of the surfaces. Abrasive blast cleaning to some degree equal to or better than SSPC SP6, Commercial Blast Cleaning over the entire area is probable; deeply pitted areas may require cleaning to SSPC SP 1 0, Near White Blast Cleaning or even SSPC SP5, White Metal Blast Cleaning prior to decontamination efforts.

NOTE: White Metal Blast Cleaning alone is not considered an effective decontamination method. Abrasive blast cleaning to this level prior to chemical decontamination is unduly time consuming and expensive.

See the Appendix for additional Decontamination Commentary.

### Decontamination Procedure

There is no industry recognized standard for soluble ferrous and ferric salt decontamination of steel. The following material and procedure is the best known available technology. Other methods will be considered, however, contractor must be prepared to demonstrate effectiveness of any proposed method and provide suitable references.

Material to be utilized in the decontamination procedure is Chlor-rid, available from Chlor-rid International, PO Box 908, Chandler, AZ 85244, 1-800-422-3217, 602-821-0039, FAX 602-821 0364.

A Chlor-rid solution mixed with water will remove soluble ferrous and ferric salts from the surface of visibly clean metal. Visibly clean metal is a relative term. To be effective the solution must come in contact with all of the ferrous and ferric salts. The water/Chlor-rid solution will penetrate a slight amount of rust, but heavy deposits such as at the bottom of pits will act as a barrier and prevent the required chemical action. It is the contractors responsibility to assure that the method utilized will achieve the end results.

THE DECONTAMINATION PORTION OF THIS SPECIFICATION IS A PERFORMANCE SPECIFICATION: THE CONTRACTOR MUST REMOVE ALL SOLUBLE FERROUS AND FERRIC SALTS FROM THE STEEL AS DETERMINED BY THE POTASSIUM FERRICYANIDE TEST PAPER METHOD DESCRIBED IN NACE 6G186.

Decontamination Hold Point and Inspection

**Lyondell Chemical Company**  
**Chlor\*Rid Specification**  
**High Pressure Wash-Dry Abrasive Blast**

- 1.0 Pressure wash with a high pressure washer at a minimum of 10,000 psi. The wash water is to be of potable quality and Chlor\*Rid is to be added by means of a siphon device or pressure pump capable of overcoming the inlet line pressure, or from a pre-mixed holding tank. This is necessary to assure the introduction of the Chlor\*Rid chemistry. A backflow prevention device shall be installed in the supply line prior to the chemical introduction location (check local code).
  
  - 2.0 Chlor\*Rid is to be introduced at the approximate dilution of 1 US gallon per 100 US gallons of wash water. The operator shall apply the wash solution at the rate of approximately 300 square feet of surface area per 100 US gallons of blast solution. The high pressure washer is to be equipped with a 0 to 15 degree nozzle and the nozzle is to be held a minimum of 4" to a maximum of 10" from the surface being washed.
  
  - 3.0 When an area of approximately 25 square feet has been washed, the surface is to be tested for soluble salt contamination by means of the Chlor\*Test method. If the contamination is below the required level of less than 5-10 ppm, the square foot application rate may be increased with another test performed to ensure cleanliness at that application rate. This may be done several times to determine the necessary application rate needed to remove the soluble salts is to be re-washed at a higher application rate to achieve a clean surface.
  
  - 4.0 After determining that soluble salts are not in excess of the specification required maximum, (5-10 ppm) by the prescribed test method, proceed to abrasive blast the surface to SSPC SP-5,10,6 or 7 as required by the specification, for final surface preparation.
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## Specifications by NASA - Kennedy Space Center

### 6. Surface Cleaning and Preparation

#### 6.1. Removal of Oil and Grease

Visible deposits of oil or grease shall be removed by methods specified in SSPC-SP 1, Solvent Cleaning, from all surfaces to be painted.

#### 6.2. Removal of Soluble Salts

6.2.1. A surface contamination analysis test (SCAT) shall be performed every 500 square feet by means of a Bresle Cell/SCAT Kit on all surfaces to be painted. Surfaces with chloride levels exceeding  $3 \mu\text{g}/\text{cm}^2$  (micrograms per square centimeter) for submerged surfaces and  $5 \mu\text{g}/\text{cm}^2$  for exposed surfaces shall be treated with a liquid soluble salt remover equal to CHLOR\*RID as manufactured by CHLOR\*RID International, Chandler, AZ. Because the Bresle Patch Method will extract only 45 to 60 percent of the salts on tile surface, the Bresle test results shall be multiplied by 2 in determining the surface chloride level for comparison with the specified allowable levels. Results are to be recorded.

6.2.2. CHLOR\*RID shall be applied by pressure washing at a minimum of 3,000 psi using one gallon of CHLOR\*RID for each 100 gallons of potable water. A backflow preventive device shall be installed in the water supply line. The pressure washer is to be equipped with a 0 to 15 degree nozzle, which shall be held 4" to 10" from the surface.

6.2.3. The wash solution shall be applied initially at a rate of 600 to 800 square feet per 100 gallons. After an area of approximately 100 square feet has been washed, the surface shall be re-tested for chloride contamination. Based on the test result, the application rate and the dilution ratio of the wash solution may require adjustment in order to attain the specified degree of cleanliness.

6.2.4. Any test area that is in excess of the acceptable chloride level shall be re-washed at an adjusted application rate and/or dilution ratio so as to achieve a clean surface.

6.2.5. As the work progresses, soluble chloride level tests are to be performed in the prescribed manner every 500 square feet to ascertain cleanliness to meet the required level. Results are to be recorded.

6.2.6. Pressure washing shall be controlled per SSPC Class 3W. All wash solution used shall be collected, filtered, and tested to ensure that the water meets Federal, Georgia, and local limits for cleanliness and toxic metals prior to disposal, which shall be in accordance with the approved lead abatement plan. Results are to be recorded.

6.2.7. Contractor shall furnish all necessary test equipment.

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## Specification by US Army - Corp. of Engineers

Sector Gate Blocking Locations". The blocking method shall be such as to provide full contact of blocking with frame joints and to support the sector gates in a level configuration. Access for cleaning and painting of blocking locations shall be accomplished by jacking adjacent framing sufficiently for the removal of blocking. The centerline of jacking locations shall be not more than eight inches from the centerline of initial blocking locations. Each blocking location shall be securely jacked prior to removal of blocking at another location.

C1-6 REFERENCE DRAWINGS. A typical lock sector gate is shown on the reference drawings. Reference drawings may not accurately show actual field conditions. The Contractor will be responsible for assessing actual field conditions such as deposits of mud, shells, etc., and will not be relieved of the responsibility of performing in strict accordance with these specifications because of reference drawing inaccuracies.

C1-7 GENERAL REQUIREMENTS. Accessory items such as timbers, seals, bushings, handrails, walkway grating, and fender frames will be removed from sector gates by the Government prior to delivery to the Contractor's facility. Bushing housings will be covered by the Government with protective covers secured to the bushing housings. The protective covers shall not be removed during this contract. Approximate weight of each sector gate with accessory items removed is 120 tons.

### C1-B CLEANING AND PAINTING.

C1-8.1 Sequence of Work. The surface area to be cleaned and painted shall be divided into specific areas of work by the Contractor. Cleaning and priming as specified herein of each area of work shall be completed prior to the start of cleaning of other areas. The Contractor shall submit a plan for cleaning and priming to the Government for approval within ten-working-days after award of this contract. After cleaning and priming of all areas has been completed, intermediate and top coats shall be applied as specified herein. After completion of topcoat application, blocking locations shall be cleaned and painted

C1-8.2 Cleaning. All surfaces of the sector gates with the exception of the face of rack gear teeth shall be cleaned in accordance with Steel Structures Painting Council (SSPC) - SP 10, "Near-White Metal Blast Cleaning. The face of rack gear teeth shall be cleaned in accordance With SSPC - SP 7, "Brush-Off Blast Cleaning". Prior to the application of paint, the-Face -of rack gear teeth shall be coated with grease to prevent the adhesion of paint. Care shall be exercised to prevent the application of grease to other surfaces. The existing paint was tested for total lead content and the lead content was determined to be 270 ppm. Removal of mud deposits, shells, and other foreign material shall be the responsibility of the Contractor. After completion of blast cleaning but prior to the application -of primer, all blast cleaned surfaces shall be pressure washed with a high-pressure washer at a minimum of 3000 psi. The Contractor shall notify the Government at least 48 hours prior to pressure washing. The wash water shall be of potable quality and shall have liquid soluble salt remover added by means of a siphon device or pressure pump capable of overcoming the inlet line pressure, or from a pre-mixed holding tank. The high pressure washer shall be equipped with a 0 to 15 degree nozzle and the nozzle shall be held a minimum of four inches to a maximum of 10 inches from the surface being washed. The liquid soluble salt remover shall be introduced at the approximate dilution of one US gallon per 100 US gallons of wash water. The operator shall apply the wash solution at the rate of approximately 100 US gallons of wash solution per 300 square feet of surface area. After washing a test area of approximately 25 square feet, the surface will be inspected by the Government inspector for soluble salt/chloride contaminants. The square foot application rate may be adjusted based on the test results and an additional test area inspected. This procedure may be repeated several times as required until the optimum application rate for washing of the remaining surfaces is determined by the Government inspector.

Surfaces shall not be flushed with untreated water after pressure washing. Liquid soluble salt remover shall be as manufactured by Chlor-Rid International Inc. or equal as approved by the Government. The contractor shall submit to the Government for approval within ten working days after award of this contract, specifications for the liquid soluble salt remover proposed. The liquid soluble salt remover shall be as recommended by the manufacturer of the paint furnished and shall be in accordance with the following requirements :

VOC:	None
PH:	3.3(+/-2)
Application temperature:	33 degrees F to 250 degrees F
Components	Single Component

### C108.3 Painting

C1-8.3.1 Materials. Painting shall be as manufactured by Wasser High Tech Coatings or equal as approved by the Government. The Contractor shall submit to the Government for approval within 10 working days after the award of this contract, specifications and application instructions for the paint proposed. Paint shall be in accordance with the following requirements:

#### Spot Primer Coat (Wasser MC-Zinc)

Generic Type:	Zinc-rich, single component, moisture-cure polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume solids:	60% minimum
Pigment Type:	Minimum 83% zinc dust in dry film
Dry film thickness	2-3 mils (50-75 microns)
VOC:	Not to exceed 2.8 lb/gal
Weight per gallon:	Minimum 23lb/gal

#### Full Primer Coat (Wasser MC-Zinc)

Generic Type:	Zinc-rich, single component, moisture-cure polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume solids:	60% minimum
Pigment Type:	Minimum 83% zinc dust in dry film

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## 6. Surface Cleaning and Preparation

### 6.1. Removal of Oil and Grease

Visible deposits of oil or grease shall be removed by methods specified in SSPC-SP 1, Solvent Cleaning, from all surfaces to be painted.

### 6.2. Removal of Soluble Salts

6.2.1. A surface contamination analysis test (SCAT) shall be performed every 500 square feet by means of a Bresle Cell/SCAT Kit on all surfaces to be painted. Surfaces with chloride levels exceeding  $3 \mu\text{g}/\text{cm}^2$  (micrograms per square centimeter) for submerged surfaces and  $5 \mu\text{g}/\text{cm}^2$  for exposed surfaces shall be treated with a liquid soluble salt remover equal to CHLOR\*RID as manufactured by CHLOR\*RID International, Chandler, AZ. Because the Bresle Patch Method will extract only 45 to 60 percent of the salts on tile surface, the Bresle test results shall be multiplied by 2 in determining the surface chloride level for comparison with the specified allowable levels. Results are to be recorded.

6.2.2 CHLOR\*RID shall be applied by pressure washing at a minimum of 3,000 psi using one gallon of CHLOR\*RID for each 100 gallons of potable water. A backflow preventive device shall be installed in the water supply line. The pressure washer is to be equipped with a 0 to 15 degree nozzle, which shall be held 4" to 10" from the surface.

6.2.3 The wash solution shall be applied initially at a rate of 600 to 800 square feet per 100 gallons. After an area of approximately 100 square feet has been washed, the surface shall be re-tested for chloride contamination. Based on the test result, the application rate and the dilution ratio of the wash solution may require adjustment in order to attain the specified degree of cleanliness.

6.2.4 Any test area that is in excess of the acceptable chloride level shall be re-washed at an adjusted application rate and/or dilution ratio so as to achieve a clean surface.

6.2.5 As the work progresses, soluble chloride level test are to be performed in the prescribed manner every 500 square feet to ascertain cleanliness to meet the required level. Results are to be recorded.

6.2.6 Pressure washing shall be controlled per SSPC Class 3W. All wash solution used shall be collected, filtered, and tested to ensure that the water meets Federal, Georgia, and local limits for cleanliness and toxic metals prior to disposal, which shall be in accordance with the approved lead abatement plan. Results are to be recorded.

6.2.7. Contractor shall furnish all necessary test equipment.

### 6.3 Raw Water Pump Station Building Exterior

6.3.1 Oil and grease deposits shall be removed in accordance with paragraph 6.1

6.3.2 The steel panels and other metal surfaces to be painted shall be lightly abraded using rotary power tools (coated abrasives, wire brushes, and/or non-woven abrasives) equipped with H.E.P.A. (High Efficiency Particulate Air) vacuum attachments. Material removed shall be tested and properly disposed of in accordance with the approved lead abatement plan. Visible corrosion and corrosion by-products and barrier deposits shall be removed using H.E.P.A – vacuum-equipped power tool cleaning (SSPC-SP3).

- 6.3.3. Prior to applying the specified coatings, all surfaces to be painted shall be cleaned by pressure washing at a minimum of 3,000 psi. All surfaces shall be SCAT tested and soluble salts shall be removed in accordance with paragraph 6.2.
- 6.4 Pipes, Valves, Fittings, Structural Members, Handrails, Light Poles, Ladders, Conduits, etc

These surfaces may be cleaned by abrasive blasting or by hydroblasting (ultrahigh-pressure water jetting) prior to recoating

6.4.1. Cleaning by Abrasive Blasting

6.4.1.1 Before abrasive blast cleaning, visible deposits of oil or grease shall be removed in accordance with paragraph 6.1.

6.4.1.2 Abrasive shall contain less than 5 percent free silica. Copper slag abrasive shall not be used.

6.4.1.3 Blastox or approved equal shall be pre-blended with the abrasive in accordance with the manufacturer's instruction so as to pre-stablize lead-containing wastes and render them permanently non-hazardous.

6.4.1.4 Surfaces to be coated shall receive a sweep blast to remove all delaminated coating, corrosion products, or other barrier materials. Surfaces, including corroded metal surfaces, shall then be SCAT tested and soluble salts shall be removed in accordance with paragraph 6.2.

6.4.1.5 Following the procedures in paragraph 6.4.1.4, surfaces shall be cleaned to achieve an SSPC-SP 6 Commercial Blast Cleaning Standard. Abrasive blast profile shall be not less than 1.0 or exceed 2.0 mils. Particular attention shall be given to edges, crevices, nuts, bolts, rivets, and weld seams.

6.4.1.6 Following blast cleaning and before applying the specified coatings, all surfaces to be painted shall be SCAT tested and soluble salts shall be removed in accordance with paragraph 6.2.

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**SURFACE PREPARATION AND COATING SYSTEM  
FOR THE PRESIDENTIAL PLACE CONDOMINIUM  
BOCA RATON, FLORIDA**

Specification by Tnemec Paint Company

1.0 **SCOPE**

The intent is to remove the marginally adhering system presently showing disbondment from aluminum surfaces- Those surfaces include aluminum handrails and stanchions of the balconies and guard gates. Also included in the scope is the preparation of the aluminum surface, and the surface of the epoxy/ urethane system found to be well adhering. After preparation, the aluminum surface will be spot primed, and the entire surface coated in a color matched to the present color on the structure. Because of the location of the project, it is important that all surfaces are clean just before priming and just prior to top coating. It must be recognized that contamination from "salt air" is likely. Areas need to be cleaned of the residue and/or protected during the painting process.

2.0 **SURFACE PREPARATION**

- 2.0.1 Remove all loose/marginally adhering materials by any means of hand or power tool cleaning feasible. Clean as per the spirit of SSPC-SP2 Hand Tool Cleaning or SSPC.5113 Power Tool Cleaning.
- 2.0.2 Also remove insoluble contaminants, corrosion by-products, or corrosion cakes by hand or power tool cleaning.
- 2.0.3 Sand the entire aluminum piece to etch/provide tooth on the surface of the well adhering epoxy/urethane and the surface of the aluminum. Feather edges to a smooth transition.

Note: We cannot emphasize enough the importance of cleaning the prevent substrate, the prepared aluminum, and between coats particularly the present surface substrate. Salt air has contaminated the surfaces of the present substrates. It should be removed before commencing with 2.0.1. We do not want to limit the contractor in the methods of cleaning; we are thinking in terms of power washing with detergent power washing with a soluble salt remover, power washing supplemented with scrubbing, using stiff bristle brushes, or scrubbing with detergent and/or the soluble salt remover.

3.0 **COATING SYSTEM**

- 3.0.1 Spot prime all bare aluminum with one coat of 66-color at 2.0 to 3.0 mils, Thin as necessary up to 10 percent (10%) with 41-39 Thinner.
  - 3.0.2 Topcoat the entire aluminum piece with one coat of 73-color at 2.5 to 3.5 mils. Thin as necessary up to 10 percent (10%) with 41-39 Thinner.
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September 11, 1996

VIA FAX 27-21-852-7104  
Mr. John Cremer  
Pro-Ex International cc/TA  
Wasser S.A.

Re: Vessel Atlantic Pioneer

Dear John:

Sorry for the delay, please use the following specification.

Painting specification for Atlantic Pioneer, wooden-hull & deck:

- 1.0 Surface Preparation: Remove all grease and oil products via degreasing and or steam cleaning methods, or use Wasser Paint-Prep Degreaser, accordingly to attached instruction sheet. Evacuate via rinse and vacuum or pump methods. Now remove existing paint via hydro-blast or sandblast or wet-abrasive blast cleaning technique. Evacuate spent abrasives, paint chips and all other deleterious materials.

Remove salt-contamination from inside wooden surfaces by tap-water rinse and Chlor-Rid™ solution starting with a ratio of 1 part Chlor-Rid™ to 100 parts water (i.e. 1 liter to 100 liters), following manufacturers recommendations, and a rate of 300-600 PT 2/ gallon. Do this twice, if salt contamination is visually apparent, or if readings taken are in excess of 3-5 micrograms per cm<sup>2</sup>.

Allow surfaces to dry completely for 12-24 hours. Blow down surfaces prior to application to remove any surface dust or dirt.

2.0 Application:

2.1 Hull & Deck

Sealer: MC-Tar, thinned 50% to aid in penetration, at 8-10 mils WFT (2.5-3 mils DFT). Allow 3-4 hours cure. Sand any bubbles down to sound film only, do not remove.

Topcoat: MC-Tar, thinned 10% maximum. Apply at 14-18 mils WFT (8-10 mils DFT), Allow 6-8 hours cure, but only until **slightly tacky (this is required for antifouling)**.

U.S. Department of the Interior – Bureau of Reclamation

Modification No. 003 to Contract No. 1425-5-CC-32-02570

page 2 of 4

- A. Description of the Change : The contract is hereby modified to incorporate the following full and complete equitable adjustment for the changed contract work as described below:
- (1) The Contractor shall: Provide an elastomeric texture coating for top-of-dam concrete.
    - (a) The areas to be treated are:
      - Roadway curbs (not the roadway itself)
      - Inside face of parapet walls
      - Top of parapet walls
      - Inside spaces of decorative features on parapet walls
      - Walking surface on both catwalks to the intake towers
      - Inside face of catwalk parapet walls
      - Top of catwalk parapet walls
      - Inside spaces of decorative features on catwalk parapet walls
    - (b) Prior to applying the elastomeric texture coating, treat all areas to receive the coating with a liquid soluble salt remover, equal to “CHLOR\*RID” International Inc. Chandler, Arizona. Apply as per manufacturer instructions.
    - (c) Apply the elastomeric texture coating to the above areas. Use the same product used for the pylon restoration. Apply as per manufacturer instructions.
    - (d) The color of the elastomeric texture coating shall be No. 3388 of Benjamin Moore and Company Industrial Maintenance Coatings.
  - (2) Any and all claims, requests for equitable adjustment or other disputes associated with this contract change identified by (1) above, unless properly excepted on the release.
  - (3) Any and all impact costs, including costs involving delays and disruptions or other associated direct or indirect costs associated with this contract change identified by (1) above.

The Contractor shall furnish all necessary labor, equipment and materials required for completion of the work by this change.

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# Rocon, Inc

140 Blackwood-Barnsboro Road  
Sewell, New Jersey 08080

## FAX TRANSMITTAL

Date:

Total Number of Pages : 1  
(including this sheet)

TO: Enviro Coat Systems

Fax Number: 602-821-0364

Attention: Jerry

From: Bud Rossi

RE: Mobil Oil Paulsboro N.J.

### Step 2 – Pressure Wash

After the initial brush blast operation, continue the surface preparation by pressure washing the part's internal surfaces with a combination of CHLOR\*RID and water. Follow the manufacturer's suggested mix ratio. The part shall be washed until the part's internal surfaces have soluble chloride salt levels of under 7.5 micrograms per square centimeter. The CHLOR\*RID is available from Enviro Coat Systems in Chandler, AZ. There telephone number is 602-821-0039.

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Contract Name : Dewatering Bin Structural Steel Coating  
Contract Number: 5010805  
Work Order Number : 151670  
Purchase Order Number: PO97

- 2.0.5 Opening on machinery, instruments, etc, shall be completely sealed before cleaning is started. Special attention shall be given to sealing of bearings housings on all rotating equipment.
  - 2.0.6 Unless otherwise specified in this specification or by Owner, anchor profile height shall be approximately 1/3 of specified dry film thickness of prime coat.
  - 2.0.7 Surfaces to be coated shall be cleaned in accordance with the surface preparation specified before application of coating. Oil and grease shall be removed by any solvent wiping detergent cleaning or other Owner approved methods prior to mechanical surface preparation.
  - 2.0.8 Surfaces to be coated shall be dust free, dry and clean of oil and grease, and shall be in proper condition to receive required to finish.
  - 2.0.9 When either acid etching or abrasive blasting is required, the Contractor shall coordinate the activities with Owner sufficiently in advance such that work schedules may be coordinate with plant operations.
  - 2.0.10 All oil, grease, salts, chlorides, sulfides and all other contaminates shall be removed in accordance with one of the following methods:
    - 2.0.10.1 CHLOR\*RID specification using dry abrasive blast followed by pressure wash with CHLOR\*RID followed by another dry abrasive blast. Abrasive blast the entire area to be coated with a near white blast per SSPC-SP-10 to remove all delaminated coating, corrosion byproducts or other barrier materials. Barrier deposits left behind will form a mask over the salts and will prevent their removal. After sweep blasting procedures are completed, pressure wash with a high pressure washer at a minimum of 3000 PSI. The wash water is to be of potable quality and CHLOR\*RID is to be added by means of a siphon device or pressure pump capable of overcoming the inlet line pressure, or from a pre-mixed holding tank. This is necessary to assure the introduction of the CHLOR\*RID chemistry. A backflow prevention device shall be installed in the supply line prior to the chemical introduction location. CHLOR\*RID is to be introduced at the approximate dilution of 1 US gallon per 100 US gallons of wash water. The operator shall apply the wash solution at the rate of approximately 300 square feet of surface area per 100 US gallons of wash solution. The high pressure washer is to be equipped with a 0 to 15 degree nozzle and the nozzle is to be held a minimum of 4" to a maximum of 10" from the surface being washed. When an area of approximately 25 square feet has been washed, the surface is to be tested by the contractor for soluble salt contamination. If the contamination is below the required level the contractor can proceed with washing the entire work area. Any test area that is confirmed to be in excess of the acceptable level of soluble salts is to be rewashed at a higher application rate to achieve a clean surface. The acceptable level of soluble salts shall be 3 micrograms per square centimeter. After soluble salt contaminants are removed to the required specified level, proceed with the final abrasive blast to white metal per SSPC-SP-5 standards for final surface preparation. The minimum profile shall be 2 mils deep and jagged in nature.
    - 2.0.10.2 CHLOR\*RID specification using a high pressure wash with CHLOR\*RID followed by a dry abrasive blast. Pressure wash with a high pressure washer at a minimum of 10,000 PSI. The wash water is to be of potable quality and CHLOR\*RID is to be added by means of a siphon device or pressure pump capable of overcoming the inlet line pressure, or from a pre-mixed holding tank. This is necessary to assure the introduction of the CHLOR\*RID chemistry. A backflow prevention device shall be installed in the supply line prior to the chemical introduction location. CHLOR\*RID is to be introduced at the approximate dilution of 1 US gallon per 100 US gallons of wash water. The operator shall apply the wash solution at the rate of approximately 300 square feet of surface area per 100 US gallons of wash solution.
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