


<b>TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE</b> <i>(Read instructions on the reverse side prior to initiating this form)</i>	DATE 9/27/2012	TRANSMITTAL NO. 3
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**SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS** *(This section will be initiated by the contractor)*

TO: Mr. Joe Gilbert Willbros. Government Services, LLC 2087 East 71st Street, Tulsa, OK 74136	FROM: Abhe & Svoboda, Inc. 91-161 Olai Street Kapolei, HI 96707	CONTRACT NO.  N62583-09-d-0132	CHECK ONE: <input checked="" type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
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SPECIFICATION SEC. NO. <i>(Cover only one section with each transmittal)</i>	PROJECT TITLE AND LOCATION Redhill Tank No. 5, FISC, Pearl Harbor, HI	CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input checked="" type="checkbox"/> GOV'T. APPROVAL
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ITEM NO.  <i>a.</i>	DESCRIPTION OF ITEM SUBMITTED <i>(Type size, model number/etc.)</i>  <i>b.</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>  <i>c.</i>	NO. OF COPIES  <i>d.</i>	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE  <i>g.</i>	VARIATION <i>(See instruction No. 6)</i>  <i>h.</i>	FOR CE USE CODE  <i>i.</i>
				SPEC. PARA. NO.  <i>e.</i>	DRAWING SHEET NO.  <i>f.</i>			
a	Surface Preparation Work Plan	Work Plan	1			A		
b	Coatings Application Work Plan	Work Plan	1			A		

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.  - Nick Schmid, Area Manger NAME AND SIGNATURE OF CONTRACTOR
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**SECTION II - APPROVAL ACTION**

ENCLOSURES RETURNED <i>(List by Item No.)</i>	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE



# **WORK PLAN -A**

## **SURFACE PREPARATIONS**

**REDHILL TANK NO. 5 COATING**

**COATING OF UNDERGROUND STORAGE TANK**

**OHAU**

**Purchase Order No. 54118-042-00**

**UFGS Specification 09 97 13.15**

**LOW VOC POLYSULFIDE INTERIOR COATING OF  
WELDED STEEL PETROLEUM FUEL TANKS**

**Date: June 22, 2012**

**ASI Job No.**

*Abhe & Svoboda, Inc. An Equal Opportunity Employer*

## Purpose and Intent

The Purpose and Intent of this Work Plan A is to set forth the processes and procedures to be implemented for surface preparation of the interior of Tank no.5, in order to the meet the specific requirements of UFGS Specifications 09 97 13.15(Low VOC Polysulfide Interior Coating of Welded Steel Petroleum Fuel Tanks). This Work Plan outlines the procedures for Safety, Environmental Control, and Quality Control as they apply to the Surface Preparation requirements. This Work Plan describes the phases of coating operations, addresses the sequence of work, and identifies the inspection and testing requirements, procedures and processes that are required to achieve the necessary quality requirements for the project. Requests for changes, modifications or revisions to this Work Plan will be submitted in writing for approval. Modifications to the plan must be approved prior to the respective work commencing. Changes, modifications or clarifications to this Work Plan will be forwarded to Nick Schmid for approval and submittal to the Contracting Officer as required. This Work Plan will be reviewed continuously and revised for increased effectiveness. Specified reference manuals or standards will be available onsite for reference.

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7. Receipt and Storage of Materials
8. Pre-Surface Preparation Testing and Inspection
9. Surface Preparation
10. Surface Preparation Testing and Inspection
11. Testing Prior to Primer Coat
12. Surface Preparation of Coated Surfaces

## **GENERAL NOTES**

1. Abrasive Media that does not conform to the Mil Spec requirements will be marked Do Not Use and isolated from the storage area. If non-conforming abrasive happens to be used, those areas will be re-blasted with conforming abrasive. The areas of the tank blasted will be defined by part of the tank (Roof, Shell or Floor) that is being blasted. Each new lot of abrasive will be listed on the QC report to the defined area(s) the lot was used.
2. ASI intends to observe the lighting requirements outlined in SSPC Guide NO.12 and defined uses in permit and non permit confined space set up locations in accordance with OSHA 1910. An EasyView™ Light Meter or GE Pocket Light Meter Model 217 or equivalent will be used to measure the foot candles of light around the work areas. The results will be documented on the QC Reports.
3. Changes, modifications or clarifications to this Work plan will be made in writing and forwarded for Approval and submittal to the Contracting Officer as required.

## **1.0 PROJECT RESOURCES:**

### **1.1 Equipment Resources**

- 1.1.1 Explosion Proof Exhaust Ventilation Fans 4,000 – 10,000 cfm variable (if required)
- 1.1.2 Dust Collection Equipment (3) 5,000 cfm Dust Units
- 1.1.3 Interior Tank Scaffolding (booms provided by WGS)
- 1.1.4 Explosion Proof Lights: General Work Area – 10 foot candles, Surface Prep and Coating Areas- 20 foot candles, Inspection and Test Locations – 50 foot candles
- 1.1.5 Air Compressor Ingersol Rand (1,170 cfm) w/ Desiccant Air Dryer
- 1.1.6 Abrasive Blast Pots (3) 600 lbs Pots
- 1.1.7 Electric Powered Industrial Vacuum
- 1.1.8 Pressure washers (if needed)
- 1.1.9 1 ½” Blast Hose with Blast Hose whips and nozzles
- 1.1.10 Dehumidification equipment (DH Tech DH6500)
- 1.1.11 Related Quality Control Inspection Equipment
- 1.1.12 DH Tech- Air Patrol® automated monitoring system or equivalent

### **1.2 Materials**

- 1.2.1 Abrasive
  - 1.2.1.1 Kleenblast® Abrasive-30/60 mesh.

- 1.3 Manpower:
  - 1.3.1 QCM
  - 1.3.2 Project Superintendent
  - 1.3.3 Painter(s)
  - 1.3.4 Laborer(s)

## **2.0 SITE SAFETY HAZARD ANALYSIS**

A Site Specific Safety Hazard Analysis will be conducted by a Competent Individual, to assess and identify potential and actual physical and mechanical hazards that may or have the potential to cause injury or create or promote adverse health effects. The Hazard Analysis and Hazard Control Measures will be conducted in accordance with Title 29 Code of Federal Regulations 1926.20 “Employer Responsibilities” to include regular and frequent safety inspections. Employee Training will be conducted in accordance with the hazard analysis requirements and documented in accordance with Title 29 CFR 1926.21 to include applicable training requirements prescribed in Performance Based Standards to include EM-385-1-1 and SSPC Guide NO.12 Guide for Illumination of Industrial Painting Projects.

A Safety Management System has been developed to outline the Responsibilities and Authority of Key Personnel involved in Safety Performance and Regulatory Compliance. A copy of the Site Safety Hazard Analysis and Control Measures will be incorporated into the Safety Management System upon the initial site safety inspection.

## **3.0 WORK SCHEDULING AND PROGRESS REPORTS**

### **Scheduling**

The QCM will keep ASI updated with the Progress Schedule that will be developed to detail phases of work, and inspection processes for the scope of services. The Progress Schedule will be communicated to involved parties for scheduling surface preparation activities, inspections and testing processes. The Schedule will be revised as applicable based on actual production, unpredicted inclement weather, and delays created by other parties. The Inspector and ASI Superintendent will make a diligent effort to maintain good communications so that inspections and testing will be performed in a timely manner with the scheduled work processes. Inclement Weather Considerations Local forecast will be utilized to coordinate work activities, to monitor weather changes, particularly if there is a sharp increase in relative humidity and elevated dew points. These will be evaluated on a case by case event in order to predict and assess adverse impacts created by atmospheric conditions. The Inspector and ASI Superintendent will work closely together to ensure weather conditions are interpreted correctly to the Contracting Officer’s representative.

#### **4.0 PRE-APPLICATION MEETING**

Prior to surface preparation or coating operations, a Pre-Application Meeting will be conducted in accordance with specification section 09 97 13.15, paragraph 1.4.8, with all involved parties to include but may not be limited to:

- Abhe & Svoboda, Inc. Representatives
- Willbros. Government Services Representatives
- NAVY Representatives

Items to be discussed include the following

- Specification Section 09 97 13.15 Surface Preparation Requirements
- Corrective action requirement and procedures
- Review of Work Plan A
- Safety Plan
- Coordination with other sections
- Inspection standards
- Inspection requirements and procedures
- Test Procedures
- Environmental Control Systems
- Test Logs
- Recordkeeping and Reporting

A Daily Planning Meeting will be conducted each morning or as needed or deemed necessary to discuss the scheduled activities. The meeting will be attended by the Inspector and ASI Superintendent. Items will be discussed pertaining to work locations, processes, required testing and inspections. Deviations from the Work Plan or Contract Requirements will require Contracting Officer's approval and a Work Plan revision.

#### **5.0 HOLD POINT INSPECTIONS**

Hold Point Inspections will occur throughout the project during specific periods as detailed within Section 09 97 13.15. A Hold Point Inspection can consist of visual inspections and or testing to acquire data results to establish the steps and actions for scheduled surface cleaning processes. The Inspector and ASI Superintendent will conduct inspections and tests at regular intervals and document the findings per requirements. The inspection data results will be forwarded to the QCM for compliance verification signature, and submission to Navy. Calibration documentation for all instruments will be submitted as required. The accuracy of thickness gages will be verified daily and noted on the Quality Control Inspection Report.

### Hold Point Inspections (Surface Preparation)

Step	Action
1) Prior to Production	✓ Safety
2) <u>Environmental Conditions</u> Maintain conditions through out the surface preparation and prime coat application to prevent the development of corrosion on blast cleaned surfaces. Continuous monitoring will be performed	✓ Temperature ✓ Humidity ✓ Dew Point ✓ Surface Temperature
3) Abrasive Material Conformance	✓ Verify material meets MIL-A-22262
4) Tank Cleaning 4.a) Initial Blast Cleaning in bowl of tank (test blasting) per 09 97 13.5 – paragraph 3.9.5	✓ Verify work completed ✓ Visual inspection of substrate for profile in excess of 3 mils
5) Pre-Preparation Testing for Surface Contaminants	✓ Presence of Oil or Grease ✓ Surface Soluble Salts Testing ✓ Visual Inspections
6) Abrasive Blast Cleaning	✓ Air Pressure
7) Abrasive Blast Cleanliness	✓ SSPC-SP 10 Cleanliness ✓ Substrate Profile
8) Pre-Application Testing for Surface Contaminants	✓ Presence of Oil or Grease ✓ Surface Soluble Salts Testing ✓ Visual Inspections
9) Pre-Application Testing for Surface Cleanliness	✓ Tape Test

## 6.0 ENVIRONMENTAL CONTROL SYSTEMS

### Interior of Tank

An Environmental Control System (ECS) has been designed to control environmental and atmospheric conditions inside tank. This system consists of a Dehumidification System and Exhaust Ventilation and will be put into service to control the atmospheric conditions during blasting and coating operations. The design plan will detail the systems to be employed for the length of this project. The system will provide ventilation and maintain appropriate humidity and temperature conditions inside the workspace so as to prevent degradation of the prepared steel prior to the application of the specified primer coat. The Dehumidification System and Exhaust Ventilation will provide dilution air for control of vapors in the tank to maintain a safe environment for workers. It must be noted that during application of the coating systems a short duration of elevated humidity may be experienced due to exhausting of the paint vapors. This is a normal function of the system and will not interfere with the work processes or reduce the quality of work in any way.

### Environmental Conditions

The efficiency of the Environmental Control System will be evaluated each and every day throughout the surface preparation, coating application and curing phases. The Inspector will measure environmental and ambient conditions throughout the work shifts with the following, but not limited to, equipment: Positector DPM or Sling Psychrometers and Dual Magnetic Surface Thermometers. Dew Point Depression will be calculated from the US Weather Bureau Psychrometric Tables and atmospheric Dew Points compared to the coolest surface temperature will be measured with a calibrated electronic dew point meter that will measure readings directly at the surface. The

instrument must be traceable to NIST. Production activities will only be permitted when the Inspector has measured the environmental conditions to determine the listed requirements in compliance.

## **7.0 RECEIPT AND STORAGE OF MATERIALS**

### ✓ INSPECTION REQUIRED

- Abrasive material Conformance
- Abrasive Media Storage

#### Abrasive Material Conformance

Abrasive media currently on site and media delivered prior to or during surface preparation operations will be inspected to verify conformance with Specification Requirements of MIL-A-22262. The abrasive media manufacturer, will be chosen from the current Qualified Products Database for MIL-A-22262B(2). This certification will be submitted, in the submittal process, that the abrasive meets the Non-metallic Abrasive specification MIL-A-22262. Surface Preparation operations will not be permitted to begin until the abrasive has been approved for use. The Inspector and ASI Superintendent will keep a current inventory record of all approved media. Components not meeting the Specification Requirements will be conspicuously marked and removed from the site.

#### Abrasive onsite Sampling and Testing Plan

1. QCM 3 day notification of abrasive sampling to COR
2. ASI will obtain a sampling kit (e.g. zip lock plastic bag) and mark/label appropriately (e.g. product, spec number, lot number, contract number, date, intended use, quantity).
3. ASI will make shipping arrangements to ADA Technologies Lab.
4. QCM to inspect sampling.
5. ASI to take samples per techniques and frequency of MIL-A-22262 and put in shipping container ready to be expedited shipping.
6. QCM to ship/mail out sample with Chain of Custody form or arrange for pickup.
7. ADA Technologies to test per Mil Spec Standards and issue test report back immediately.
8. Repeat steps above until find acceptable lot
9. Reblast areas that failed (if applicable).

#### Abrasive Media Storage

Abrasive media at the jobsite will be stored in a trailer which will keep it dry and out of the elements.

## **8.0 PRE-SURFACE PREPARATION TESTING AND INSPECTION**

### ✓ INSPECTION REQUIRED:

- Steel Defects
- Soluble Salts Tests (Chloride, Sulfate, Nitrate Ions)



- Oil and Grease Tests
- Air cleanliness test

#### Substrate Condition

The substrate will be assessed and inspected for existing conditions by the Inspector to determine the existing conditions of Tank. The visual condition of the substrate will be detailed and documented in the Daily Quality Control Report and the Daily Inspection Checklist. This inspection will be conducted prior to surface preparation for prior to the start of blast cleaning operations. Surface defects such as detailed within SSPC PA-1 will be inspected and properly identified.

#### Steel Defects

Steel defects such as fins, burs, erection marks, welds, and weld spatter will be addressed by the onsite Inspector. The Inspector will forward the report of conditions to the QCM. Repairs may be performed, as deemed necessary, by others or ASI for steel defects noted.

#### Soluble Salts Test

At randomly selected locations, soluble salts testing will be conducted at a rate of three (3) tests for the first 1000 ft<sup>2</sup> and one (1) test for every 2000 ft<sup>2</sup> thereof. Concentrate testing of bare steel at area of corrosion pitting. Approximately 30% of the tests on bare steel will be performed at welds, divided equally between horizontal and vertical welds. The concentration of soluble salts will be measured and utilized to dictate the necessity of chloride, sulfate, or nitrate ion removal.

For the Interior of the tank, One (1) or more readings greater than Non-detectable for chlorides, sulfates, or nitrates will trigger the need for the removal of soluble salts.

The Inspector will conduct the Soluble Salt Testing as prescribed above utilizing a Chlor\*Test “CSN” kit as manufactured by Chlor\*Rid International or equal (such as the ARP Soluble Salts Meter Model Number RPCT-07-001) after the tank cleaning prior to blast cleaning and between coating applications. Retain and label test tubes for verification and documentation.

#### Soluble Salts Removal

Surfaces that are found to be non-compliant shall be pressured washed with potable water only or potable water modified with a soluble salts remover solution, such as Chlor\*Rid or equal and retested. This procedure will be performed until the tests show allowable results.

#### Oil and Grease Test

A Water Mist (Water Break) Test will be utilized to detect the presence of oil or grease on the steel substrate prior to and after surface preparation activities, and between coating applications. A good Visual Inspection, and if deemed necessary a Cloth Rub Test will accompany the Water Break Test to ensure the quality requirements are maintained by the Inspector. Areas exhibiting the presence of oil or grease will be marked for correction prior to allowing further activities. Solvent cleaning in accordance with SSPC SP-1 will be utilized to remove the presence of oil or grease if found. The solvent

cleaning will be continued until results show no detectable presence of oil or grease. Care will be afforded to prevent further contamination by workers and inspection personnel.

#### Air Cleanliness Test

The compressed air supply used for the abrasive blast cleaning operation will be inspected for cleanliness in accordance with ASTM D 4285. The abrasive blast cleaning air supply will be tested 24 inches from the supply air as close to work area as possible with the abrasive shut off and directed to blotter paper for 60 seconds. The blotter paper will be inspected for the presence of oil, fluids, water or other deleterious materials. The Air Cleanliness Test will be conducted prior to abrasive blast cleaning and every five hours thereafter during continuous blast cleaning activities. The presence of oil, fluids, water or other deleterious materials on the blotter paper are not acceptable and require corrective actions to include equipment maintenance or reconfiguration of the air supply system and resources.

### **9.0 SURFACE PREPARATION**

Tank interior substrates and components scheduled for coating will be abrasive blast cleaned to an SSPC SP-10, Near White Metal Abrasive Blast Cleaning. ASI will use conventional abrasive air blast cleaning methods using non-metallic 30/60 mesh coal slag abrasives for the cleaning operations. ASI intends to use three (3) abrasive blast cleaning operators with a minimum nozzle pressure to achieve the desired surface profile of 2 to 3 mils. The working pressure at the nozzle should be maintained near 100 psi to achieve satisfactory profile results.

### **10.0 SURFACE PREPARATION TESTING AND INSPECTION**

- ✓ INSPECTION REQUIRED
  - Substrate Cleanliness
  - Substrate Profile

#### Substrate Cleanliness

Substrates to receive abrasive blast cleaning will be inspected for substrate cleanliness periodically throughout the workday and at the end of each shift. The Inspector will inspect the abrasive blast cleaned substrate to ensure that an SSPC SP-10 Near-White Metal Abrasive Blast is achieved prior to the application of the prime coat. Surface preparation testing and initial inspection will be conducted at the completion of the workday and initial blow down to ensure the blast cleaning process is in conformance with the specification requirements.

#### Substrate Profile

Surface profile measurements will be conducted daily by the Inspector per ASTM D 7127 to ensure compliance with the Specifications during the abrasive cleaning process. The minimum and maximum surface profile depth of 2 to 3 mils will be measured in

accordance with ASTM D 7127 using Rmax as the measure of profile height at a rate of three (3) tests for the first 1000 ft<sup>2</sup> plus one (1) test for each additional 1000 ft<sup>2</sup> or part thereof. If approved as an alternate, the surface profile will be measured utilizing Testex Tape (X-Course) and utilizing a spring micrometer in accordance with Method C of ASTM D 4417. The test tape will be attached to Daily Inspection Reports. If the existing profile exceeds the maximum allowable profile, an existing profile evaluation will be performed to determine how to proceed with the work. If the profile, after blasting, is less than the minimum required, the area will be re-blasted until the minimum profile depth is achieved.

## **11.0 TESTING PRIOR TO PRIMER COAT**

### **✓ INSPECTION REQUIRED**

- Environmental Conditions
- Verify Surface Preparation
- Soluble Salts Tests
- Oil and Grease Tests
- Tape tests

### **Tape Test**

The prepared steel surfaces are required to be clean prior to the application of the primer coat. To test surfaces, apply a strip of 3M Scotch Magic tape #810 against the steel surface leaving one end for easy removal of the tape. Take care not to contaminate the surface with oils from fingers. Remove the cellophane tape using the exposed end and visually inspect. Little or no dust should be on surface. If the area tested is contaminated the area will be cleaned and retested. The tests will be performed by the Inspector at a rate Three (3) tests for the first 1000 ft<sup>2</sup> plus one (1) test for each additional 1000 ft<sup>2</sup>. The test tape will be attached to Daily Inspection Reports.

### **Disposal of Used Blast Media**

All the used abrasive will be disposed of in accordance with local, state and federal regulations.

## **12.0 SURFACE PREPARATION OF COATED SURFACES (if necessary)**

### **✓ INSPECTION REQUIRED**

- Environmental Conditions
- Verify Surface Preparation
- Soluble Salts Test Tests
- Oil and Grease Tests
- Tape tests

Surface preparation may become necessary to coated areas if recoat windows are exceeded or the coated surfaces become damaged. If recoat windows are exceeded then Gloss Removal may be completed by either SSPC SP-7 Brush-off Blast Cleaning or Hand Sanding with #150 to #200 wet/dry sandpaper. The de-glossed surfaces will then be pressure washed with clean potable water or wiped down with clean rags soaked with

denatured alcohol to remove dust. For chips and dings the touchup and repairs will be made to small areas that do not expose the steel substrate by brush or daubers depending on the access and location of the repair. Areas found to have exposed steel substrate larger than a dime will be spot cleaned using power tools so as to not cause additional damage to the surrounding surfaces. If the spot is small (dime size) then the area will be feathered back with #80-#120 emery cloth 2 inches back prior to application of the complete system. Inspection controls will be utilized to ensure that repairs are completed in a neat and uniform fashion to the surrounding surfaces. The brushing shall be done so that a smooth coat of coating material is applied as uniformly as possible is obtain the required coating thickness. The repairs will be completed in accordance with SSPC-PA-1. The onsite Inspector will continuously monitor the repairs for compliance.

### **REFERENCED DOCUMENTS**

The following documents will be accessible for review by the Inspector and ASI Superintendent

1. Scope of Work, Specifications, and Drawings.
2. SSPC- QP -1 Library
3. UFGS Section 09 97 13.15, Low Voc Polysulfide Interior Coating of Welded Steel Petroleum Fuel Tanks 2/10
4. ASTM D 4417 Standard Test Methods for Field Measurement of Blast Cleaned Steel
5. ASTM D 7127 Standard Test Method for Measurement of Surface Roughness of Abrasive Blast Cleaned Steel Surfaces Using A Portable Stylus Instrument
6. ASTM D 4285 Standard Test Method for Indicating Oil or Water in Compressed Air
7. ASTM D 7393 Standard Practice for Indicating Oil in Abrasives
8. ASTM D 4414 Standard Practice for Measurement of Wet Film Thickness by Notch Gages
9. ASTM E 337 Standard Test Method for Measuring Humidity with a Psychrometer



# **WORK PLAN -B**

## **COATING APPLICATIONS**

**REDHILL TANK NO.5 COATING**

**COATING OF UNDERGROUND STORAGE TANK**

**Island of Oahu**

**PURCHASE ORDER #54118-042-00**

**UFGS Specification 09 97 13.15**

**LOW VOC POLYSULFIDE INTERIOR COATING OF  
WELDED STEEL PETROLEUM FUEL TANKS**

**Date: June 23, 2012**

**ASI Job No. 11005**

*Abhe & Svoboda, Inc. An Equal Opportunity Employer*

## Purpose and Intent

The Purpose and Intent of this Work Plan B is to set forth the processes and procedures to be implemented for Coating Application on the interior of the Redhill Underground Storage Tank no. 5, in order to meet the specific requirements of UFGS Specifications 09 97 13.15 (Low VOC Polysulfide Interior Coating of Welded Steel Petroleum Fuel Tanks). This Work Plan outlines the procedures for Safety, Environmental Control, and Quality Control as they apply to the Coating Application requirements. This Work Plan describes the phases of coating operations, addresses the sequence of work, and identifies the inspection and testing requirements, procedures and processes that are required to achieve the necessary quality requirements for the project. Requests for changes, modifications or revisions to this Work Plan will be submitted in writing for approval. Modifications to the plan must be approved prior to the respective work commencing. Changes, modifications or clarifications to this Work Plan will be forwarded to Nick Schmid for approval and submittal to the Contracting Officer as required. This Work Plan will be reviewed continuously and revised for increased effectiveness.

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### General Notes

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3. Work Scheduling and Progress Reports
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5. Hold Point Inspections Summary (Surface Preparation)
6. Environmental Control Systems
7. Receipt and Storage of Materials
8. Pre-Application Testing Prior to First Coat
9. First Coat Application
10. Inspection and D.F.T. Measurements of First Coat
11. Pre-Application Testing Prior to Finish Coat
12. Finish Coat Application
13. Inspection and D.F.T. Measurements of Finish Coat
14. Final Inspection, Holiday Testing and Repair Procedures
15. Completion Inspections

## **GENERAL NOTES**

1. Coating Materials that do not conform to the Mil Spec requirements will be marked Do Not Use and isolated from the storage area.
2. Environmental conditions outside of the parameters as prescribed below will activate a Product Hold during Coating applications. The QC inspector will document the releasing and using of the identified products.
  - Minimum Air / Substrate Temperature 50° F
  - Maximum Air / Substrate Temperature 100° F
  - Minimum Dew Point Depression 18° F below coldest steel surface temperature
  - Concentration of Lower Explosive Limit : Not Determined
4. ASI intends to observe the lighting requirements outlined in SSPC Guide NO.12 and defined uses in permit and non permit confined space set up locations in accordance with OSHA 1910.
5. Pre-Coating Application testing will occur prior to application of any coatings to include the First Coat, Second Coat and any Repairs.
6. Testing and inspection in the form of low DFT mils, holidays, voids, pinholes, blisters and other detrimental conditions will be identified by the QC Inspector.
7. Cure times will be calculated by the QC Inspector throughout the curing process to obtain cure times and establish the Recoat Window and Extended Recoat Window for each coat. At the end of the Coating Application Process the QC Inspector and ASI Superintendent will calculate the Recoat Window.
8. ASI intends on completing gloss removal process only if the recoat windows are exceeded in accordance with specification requirements. The de-glossed surfaces shall be completed with the remaining application of the coating system.
9. Disposal of waste products including spent blast media, empty coating containers, thinner cans and used rags will be in accordance with local, state and federal regulations.
10. Changes, modifications or clarifications to this Work plan will be made in writing and forwarded to the Project Manager for Approval and submittal to the Contracting Officer as required.

## **1.0 PROJECT RESOURCES:**

### **1.1 Equipment Resources**

- 1.1.1 Explosion Proof Exhaust Ventilation Fans 4,000 – 10,000 cfm variable (if required)
- 1.1.2 Dust Collection Equipment (3) 5,000 cfm Dust Units
- 1.1.3 Interior Scaffolding (Boom System provided by WGS)
- 1.1.4 Explosion Proof Lights: General Work Area – 10 foot candles, Surface Prep and Coating Areas- 20 foot candles, Inspection and Test Locations – 50 foot candles
- 1.1.5 Air Compressor (375 cfm or larger) w/ Desiccant Air Dryer
- 1.1.6 56:1, 45:1, 40:1, or 30:1 Airless Spray Pumps (With Ground Wire)
- 1.1.7 1/4-3/8" Airless Spray Line w/ Airless Spray Gun
- 1.1.8 Graco XP-70 Heated Plural Component Airless Spray Pump
- 1.1.9 Airless Spray Tips (011, 013, 015, 017, 019, 021)
- 1.1.10 Pressure washers – 3700 psi with rotary tips
- 1.1.11 Dehumidification equipment (as required)
- 1.1.12 Related Quality Control Inspection Equipment

### **1.2 Materials**

#### **1.2.1 Interior Tank Coatings**

- 1.2.1.1 Premier Lining, Modified Epoxy Novolac Polysulfide Coatings, PCS-TUFF Blue #1100-S and PCS-TUFF Off White #1100-S

#### **1.2.1 Manpower:**

- 1.2.1 Project Manager
- 1.2.2 Project Superintendent
- 1.2.3 Painter(s)
- 1.2.4 Laborer(s)

## **2.0 SITE SAFETY HAZARD ANALYSIS**

A Site Specific Safety Hazard Analysis will be conducted by a Competent Individual, to assess and identify potential and actual physical and mechanical hazards that may or have the potential to cause injury or create or promote adverse health effects. The Hazard Analysis and Hazard Control Measures will be conducted in accordance with Title 29 Code of Federal Regulations 1926.20 "Employer Responsibilities" to include regular and frequent safety inspections. Employee Training will be conducted in accordance with the hazard analysis requirements and documented in accordance with Title 29 CFR 1926.21 to include applicable training requirements prescribed in Performance Based Standards to include EM-385-1-1 and SSPC Guide NO.12 Guide for Illumination of Industrial Painting Projects.

A Safety Management System has been developed to outline the Responsibilities and Authority of Key Personnel involved in Safety Performance and Regulatory Compliance.



A copy of the Site Safety Hazard Analysis and Control Measures will be incorporated into the Safety Management System upon the initial site safety inspection.

### **3.0 WORK SCHEDULING AND PROGRESS REPORTS**

#### **Scheduling**

The Project Manager will keep ASI updated with the Progress Schedule that will be developed to detail phases of work, and inspection processes for the scope of services. The Progress Schedule will be communicated to involved parties for scheduling surface preparation activities, inspections and testing processes. The Schedule will be revised as applicable based on actual production, unpredicted inclement weather, and delays created by other parties. The Project Manager, QC Inspector and ASI Superintendent will make a diligent effort to maintain good communications so that inspections and testing will be performed in a timely manner with the scheduled work processes. Inclement Weather Considerations Local forecast will be utilized to coordinate work activities, to monitor weather changes, particularly if there is a sharp increase in relative humidity and elevated dew points. These will be evaluated on a case by case event in order to predict and assess adverse impacts created by atmospheric conditions. The Project Manager, QC Inspector and ASI Superintendent will work closely together to ensure weather conditions are interpreted correctly to the Contracting Officer's representative.

### **4.0 PRE-APPLICATION MEETING**

Prior to surface preparation or coating operations, a Pre-Application Meeting will be conducted with all involved parties to include but may not be limited to:

- Abhe & Svoboda, Inc. Representatives
- Willbros. Government Services Representatives
- QC Inspector
- NAVY Representatives

Items to be discussed include the following

- Specification Section 09 97 13.15 Coating Application Requirements
- Review of Work Plan B
- Safety Management System
- Inspection Procedures and Hold Point Inspections for Coating Applications
- Inspection, Verification, Documentation and Approval Procedures
- Environmental Control Systems
- Recordkeeping and Reporting

A Daily Planning Meeting will be conducted each morning or as needed or deemed necessary to discuss the scheduled activities. The meeting will be attended by the Project Manager, QC Inspector, ASI Superintendent. Items will be discussed pertaining to work locations, processes, required testing and inspections. Deviations from the Work Plan or

Contract Requirements will require Contracting Officer's approval and a Work Plan revision.

## **5.0 HOLD POINT INSPECTIONS**

Hold Point Inspections will occur throughout the project during specific periods as detailed within Section 09 97 13.15. A Hold Point Inspection can consist of visual inspections and or testing to acquire data results to establish the steps and actions for scheduled surface cleaning processes. The QC Inspector and ASI Superintendent will conduct inspections and tests at regular intervals and document the findings per requirements. The inspection data results will be forwarded to the Project Manager for compliance verification.

### **Hold Point Inspections (Coating Applications)**

<b>Step</b>	<b>Action</b>
1) Prior to Production	✓ Safety
2) <u>Environmental Conditions</u> Maintain conditions through out the surface preparation and prime coat application to prevent the development of corrosion on blast cleaned surfaces	✓ Temperature ✓ Humidity ✓ Dew Point ✓ Surface Temperature
3) Coating Material Sample Testing Results are complete	✓ Laboratory Testing and Verification of Conformance
4) <u>Pre-Application Testing for Surface Contaminants</u> Where visual examination or spot testing indicates contamination, perform sufficient testing to verify non-contamination, or to define extent of contamination for appropriate treatment	✓ Visual Inspections ✓ Tape Test ✓ Presence of Oil or Grease ✓ Surface Soluble Salts Testing
5) Mixing Coatings / Pot Life	✓ Environmental Conditions ✓ Ratios ✓ Reduction
6) Application of First Coat	✓ Environmental Conditions ✓ Coverage ✓ Wet Film Thickness
7) First Coat Inspection	✓ Visual Inspection ✓ Environmental Conditions ✓ Dry Film Thickness
8) Cure Time	✓ Recoat Window ✓ Extended Recoat Window
9) <u>Pre-Application Testing for Surface Contaminants</u> Where visual examination or spot testing indicates contamination, perform sufficient testing to verify non-contamination, or to define extent of contamination for appropriate treatment	✓ Visual Inspections ✓ Tape Test ✓ Amine Blush Testing ✓ Presence of Oil or Grease ✓ Surface Soluble Salts Testing
10) Application of Finish Coat	✓ Environmental Conditions ✓ Coverage ✓ Wet Film Thickness
11) Finish Coat Inspection	✓ Visual Inspection ✓ Environmental Conditions ✓ Dry Film Thickness
12) Cure Time	✓ Recoat Window ✓ Extended Recoat Window
13) Cure Time, Immersion Service 14 Days	✓ Recoat Window

Four (4) days with Dehumidification on final coat	✓ Environmental Conditions
14) Holiday Testing NACE RPO 188	✓ Low Voltage Wet Sponge
15) Repairs / Touch-up	✓ Spot Repairs
16) Final Inspection	✓ Total Coating System Inspection

## **6.0 ENVIRONMENTAL CONTROL SYSTEMS**

### **Interior of Tank no.5**

An Environmental and Atmospheric Control System has been designed to control environmental and atmospheric conditions inside the tank. Environmental and Atmospheric controls are a specification requirement for surface preparation operations. Therefore, if weather conditions develop elevated humidity and dew points, all necessary systems will become an essential part of the process to control environmental conditions as needed to maintain the blast quality specified.

### **Environmental Conditions**

The efficiency of the Environmental Control System will be evaluated each and every day throughout the surface preparation, coating application and curing phases. The QC Inspector will measure environmental and ambient conditions throughout the work shifts, Sling Psychrometers and Dual Magnetic Surface Thermometers. Dew Point Depression will be calculated from the US Weather Bureau Psychrometric Tables and atmospheric Dew Points compared to the coolest surface temperature will be measured with a calibrated electronic dew point meter that will measure readings directly at the surface. The instrument must be traceable to NIST. Production activities will only be permitted when the NACE Inspector has measured the environmental conditions to determine the requirements listed below for application of the Intermediate and Topcoat.

- Minimum Air / Substrate Temperature 50° F
- Maximum Air / Substrate Temperature 100° F
- Minimum Dew Point Depression 18° F below coldest steel surface temperature
- Concentration of Lower Explosive Limit :Not Determined

## **7.0 RECEIPT AND STORAGE OF MATERIALS**

### **✓ INSPECTION REQUIRED**

- Coating Storage
- Coating Sample Test
- Environmental Conditions

### **Coating Storage**

Materials required for the performance of the scope of services will be shipped, stored and handled in accordance with the material manufacturer instructions, the contract specifications and SSPC PA-1 Guidelines. Coating Materials will be stored in a dry

location maintaining ambient conditions are above 50° F with an ambient air temperature greater than 5° F of the dew-point at all times. The QC Inspector or the ASI Superintendent will inspect the storage facility each day to ensure adequate storage and environmental conditions. A Boxcar Continuous Monitoring Device or equal may be installed to continuously document temperature, humidity and dew points, if required by the specification.

#### Coating Sample Test(s)

Coating products delivered prior to or during coating operations will be sampled to verify conformance with requirements as detailed in Table II of Section 09 97 13.15. The conformance test results, of the previously tested coatings, would be submitted to the project manager for verification purposes. If there are no previously tested batches available, and because of the following reasons: The very small quantities of coatings needed to complete this project; the location of the project on the Island of Hawaii, Hawaii; the schedule when the work is to be completed; and to accommodate the current shipping requirements of hazardous materials from the job site that may not employ the qualified personnel to ship said "Hazardous Materials.", ASI will request a variance to allow the opportunity to collect samples for testing of the coating products at the point of manufacture or the storage warehouse in lieu of the job site, as specified by the specifications. Each of the item samples would be collected and shipped to an approved testing laboratory for testing to the requirements of Table II of the respective section listed above. Collection at the manufacture facility or storage warehouse may be witnessed by a Government representative or the services of an Independent Coating Consultant may be employed, geographically located to either of these facilities. All samples would be tracked by means of a "Chain of Custody" to assure proper handling. This alternate procedure has been used on previous projects with similar circumstances and has worked very well.

One liter (quart) samples will be collected at random for each batch of base material and proportional samples of each activator based on mix ratio. Samples will be sent to an approved laboratory for testing. Ratios and proportions will be determined by measuring the units by volume to ensure that no out of ratio kits are created and the remaining coating material will be used in the work process. The mixing of partial kits will be utilized for touch up processes so as not to waste coating materials and will be monitored by the QC Inspector to ensure proper mixing is completed at all times. Results of the independent lab tests will be submitted to the CO's Representative. Coating operations will not be permitted to begin until the CO's Representative has approved the test result. The QC Inspector and ASI Superintendent will keep a current inventory and record of all approved products for the coating operations. Components not meeting the appropriate specifications of Table II will be conspicuously marked and removed from the site.

### **8.0 PRE-APPLICATION TESTING PRIOR TO FIRST COAT**

- ✓ INSPECTION REQUIRED:
  - Environmental Conditions
  - Surface Defects

- Surface Cleanliness (Oil or Grease, Soluble Salts)
  - Tank Interior Product Verification - Premier Lining, Modified Novolac Polysulfide Coatings
- ✓ During the course of abrasive blast cleaning and the First Coat application testing will be conducted to ensure that the substrate meets the Surface Preparation Requirements in the Specifications Inspections but must also meet the Pre-Application Testing prior to First Coat application.

## **9.0 FIRST COAT/PRIMER COAT APPLICATION**

- ✓ INSPECTION REQUIRED:
- Environmental Conditions
  - Mixing and Pot Life
  - Wet Film Thickness
  - Coverage

ASI will accomplish application of the First Coat of PCS 1100 by using a grounded Graco XP-70 Plural Component airless spray pump. The pump size will be a minimum of 58:1 ratio. One spray applicators will be equipped with airless spray guns fitted with .015 – .023 RAC Spray Tip. Spray tip orifice size is dependent upon the actual viscosity at time of application of the First Coat.

Tank Interior: ASI intends to apply a PCS 1100 stripe coat by brush prior to the first coat, working the coating material into corners, crevices, bolts, welds, and irregular surfaces in accordance with SSPC-PA-1. Brush application will only be used for small best effort areas. For some crevices PCS 1100 will be applied with daubers to ensure good penetration of the coating materials into tight areas on Shell Surfaces and Miscellaneous Components. No Termination Joints (Cold Joint) will be installed near the welds. Tank coating application will be uniform and continuous. Cure times will be calculated by the QC Inspector and ASI Superintendent during the start of the First Coat application to include the Stripe Coat and Full First Coat. Cure times will be calculated throughout the curing period to obtain a definite cure time and establish the Recoat window.

### Mixing and Pot Life

Mixing Ratio:                      PCS 1100:                                      1 Part A to 1 Part B by Volume (1:1)

Induction Time:                      50-60 degrees F –1/2- Hour

76-80 degrees F –1/4- Hour  
81-90 degrees F--1/8- Hour  
> 90 degrees F – 5 Minutes Mixing

Pot Life: 75 degrees – 45-90 Minutes

Reduction: No Thinners will be used

#### Wet Film Thickness Measurements

The Applicators will be equipped with Wet Film Thickness Gauges to measure the application and coverage of the First Coat. WFT of the PCS 1100 First Coat will be approximately 12-15 mils.

#### Coating Application Monitoring

Prior to starting the First Coat Application the QC Inspector and ASI Superintendent will mark out the cold joint locations for the applicators to square up the intermediate coat (if needed). These are the “Cold Joints” and will be positioned at least six (6) inches away from welds. The Floor area will be one continuous coating application free of any termination joints.

#### Cure Time Projection

Close attention will be afforded to the curing of coatings to ensure proper sequencing and scheduling of additional coats. Cure times and recoat schedules will be calculated each day based on ambient condition and film thickness. The QC Inspector will maintain a log of activities and events to include the start and stop times of coating application detailing specific areas. The QC Inspector will monitor the temperature of the Air and Substrate and utilize the highest temperature to develop the Recoat Window and Extended Recoat Window. Coating application is scheduled during the day hours and will result in the highest temperature. The QC Inspector will monitor the ambient and surface temperatures and use the calibrated instruments to obtain the highest temperature during application or during the curing time. At the end of each Application Period and during the cure time the QC Inspector will calculate the Recoat Window and record the day and time on the Inspection Report and communicate this period to the Project Manager.

## **10.0 INSPECTION AND D.F.T. MEASUREMENTS OF FIRST COAT**

### **✓ INSPECTION REQUIRED**

#### **➤ Visual Inspection**

- Cure
- Dry Film Thickness
- Coverage
- Surface Contaminates
- Cleanliness

#### Visual Inspection

A complete visual inspection will be conducted of the applied First Coat to detect defects in the form of coverage, holidays, voids, pinholes, blisters and other detrimental conditions by the QC Inspector

#### Dry Film Thickness

Dry film thickness measurements of the Primer Coat will be documented in accordance with SSPC PA-2 utilizing a Type II fixed probe gauge. Three (3) measurements will be collected per spot and averaged and five (5) spot measurements will be collected of which the five (5) spot measurements will be averaged. Each spot measurement will be within 80 percent of the minimum dry film thickness and 120 percent of the maximum dry film thickness and the average of the five spot measurements. Testing will be conducted within three (3) 100 square foot locations for the first 1,000 square feet and one (1) 100 square foot location for each additional 1,000 square feet thereafter. Dry Film Thickness measurements will be conducted and gauge calibrated in accordance with SSPC PA-2.

The First Coat will be inspected for surface defects and dry film thicknesses by the QC Inspector. Dry film thickness requirements for the PCS 1100 will be 12 to 15 mils. The Project Manager will review the inspection report and dry film thickness measurement for compliance. Dry Film Thickness measurements outside the requirements will result in a Production Hold requiring touch-up and repair work.

### **11.0 PRE-APPLICATION TESTING PRIOR TO FINISH COAT**

#### ✓ INSPECTION REQUIRED

- Environmental Conditions
- Cure Time
- Surface Contaminates
- Cleanliness
- Product Verification -

#### **Cure Time Projections**

#### **RE-COAT WINDOWS ----Epoxy over Epoxy**

Temperature degrees F	60-70	71-80	81-90	91-100	101-110	111-120
Recoat Window (Hrs)	36-336	36-240	24-168	24-96	16-48	16-48

### Soluble Salts Test

At randomly selected locations, soluble salts testing will be conducted at one half of the prescribed rate for bare steel. The concentration of soluble salts will be measured and utilized to dictate the necessity of chloride, sulfate, or nitrate ion removal.

For the Interior of the tank. One (1) or more readings greater than Non-detectable for chlorides, sulfates, or nitrates will trigger the need for the removal of soluble salts. If contamination is found revert to the specified testing rate for bare steel.

The QC Inspector and will conduct the Soluble Salt Testing as prescribed above utilizing a Chlor\*Test “CSN” kit as manufactured by Chlor\*Rid International or equal,(ARP Model Number RPCT-07-001) after the high pressure water cleaning prior to blast cleaning and between coating applications. Retain and label test tubes for verification and documentation.

### Soluble Salts Removal

Surfaces that are found to be non-compliant shall be pressured washed with potable water only or potable water modified with a soluble salts remover solution, such as Chlor\*Rid or equal and retested. This procedure will be performed until the tests show allowable results.

### Oil and Grease Test

A Water Mist (Water Break) Test will be utilized to detect the presence of oil or grease on the steel substrate prior to and after surface preparation activities, and between coating applications. A good Visual Inspection, and if deemed necessary a Cloth Rub Test will accompany the Water Break Test to ensure the quality requirements are maintained by the QC Inspector. Areas exhibiting the presence of oil or grease will be marked for correction prior to allowing further activities. Solvent cleaning in accordance with SSPC SP-1 will be utilized to remove the presence of oil or grease if found. Care will be afforded to prevent further contamination by workers and inspection personnel.

### Tape Test

The Coated steel surfaces are required to be clean prior to the application of the finish coat. To test surfaces, apply a strip of clear adhesive cellophane tape against the steel surface leaving one end for easy removal of the tape. Take care not to contaminate the surface with oils from fingers. Remove the cellophane tape using the exposed end and visually inspect. Little or no dust should be on surface. If the area tested is contaminated the area will be cleaned and retested. The tests performed will be conducted at one half of the prescribed rate for bare steel by the QC Inspector.

### Amine Blush Test



The epoxy coated surfaces are required to be tested for Amine Blush prior to the application of the Finish coat. To test surfaces, using an AMINE BLUSH CHECK kit manufactured by Elcometer, or equal. The tests will be performed by the QC Inspector at a rate Three (3) tests for the first 1000 ft<sup>2</sup> (100 m<sup>2</sup>) plus one test for each additional 2000 ft<sup>2</sup> (200m<sup>2</sup>). Surfaces that are found to be non-compliant shall be pressured washed with potable water and retested. This procedure will be performed until the tests show allowable results.

## **12.0 FINISH COAT APPLICATION**

- ✓ **INSPECTION REQUIRED:**
  - Environmental Conditions
  - Mixing and Pot Life
  - Wet Film Thickness
  - Coverage

### Environmental Conditions

Environmental conditions will be as stated in the minimum and maximum requirements. The QC Inspector will inspect product mixing and monitor pot life during the Intermediate Coat application.

### Mixing and Pot Life

Mixing Ratio:	PCS 1100:	1 Part A to 1 Part B by Volume (1:1)
Induction Time:	50-60 degrees F –1/2- Hour 76-80 degrees F –1/4- Hour 81-90 degrees F--1/8- Hour > 90 degrees F – 5 Minutes Mixing	
Pot Life:	75 degrees – 45-90 Minutes	
Reduction:	No Thinners will be used	

### Wet Film Thickness Measurements

The Applicators will be equipped with Wet Film Thickness Gauges to measure the application and coverage of the Finish Coat. WFT of the Finish coat will be approximately 12-15 mils for the Finish Coat.

### Coating Application Monitoring

Prior to starting the Intermediate Coat Application the QC Inspector and ASI Superintendent will mark out the cold joint locations for the applicators to square up the intermediate coat (if needed). These are the “Cold Joints” and will be positioned at least

six (6) inches away from welds. The Floor area will be one continuous coating application free of any termination joints.

ASI will accomplish application of the Finish Coat of PCS 1100 by using a grounded Graco XP-70 Plural Component airless spray pump. The pump size will be a minimum of 58:1 ratio. One spray applicators will be equipped with airless spray guns fitted with .015 – .023 RAC Spray Tip. Spray tip orifice size is dependent upon the actual viscosity at time of application of the Finish Coat.

### **13.0 INSPECTION & D.F.T. MEASUREMENTS OF FINISH COAT**

#### **✓ I INSPECTION REQUIRED**

- Visual Inspection
- Cure
- Dry Film Thickness
- Coverage
- Surface Contaminates
- Cleanliness

The First and Finish Coats will be inspected for surface repairs or touch up prior to the Final Acceptance of the Finish Coat. The dry film thickness will be taken by the QC Inspector. Dry film thickness of 24 to 30 mils will be obtained for the Finish Coat.

#### **Visual Inspection**

A complete visual inspection will be conducted to the applied Finish Coat to determine that specified quality requirements are maintained by the QC Inspector.

#### **Dry Film Thickness Measurements**

Dry film thickness measurements of the Intermediate Coat will be documented in accordance with SSPC PA-2, utilizing a Type II fixed probe gauge. Three measurements will be collected per spot and averaged; and the five spot measurements will to be averaged. Each spot measurement will be within 80 percent of the minimum dry film thickness and 120 percent of the maximum dry film thickness and the average of the five spot measurements of the total system applied. Testing will be conducted within three (3) 100 square foot locations for the first 1,000 square feet and one (1) 100 square foot location for each additional 1,000 square feet thereafter. Dry Film Thickness measurements will be conducted and gauge calibrated in accordance with SSPC PA-2.

If additional coats are required after the initial application of the finish coat for the PCS 1100 in the UST's the steps laid out in Section 13.0 will be followed again. This will be the process until Final Acceptance is approved.

#### UST's - Interior Coating System

Coat	Min DFT (mils)	Max DFT (mils)
First Full Coat	12	15
Finish Coat	12	15
Total System =	24	30

### **14.0 FINAL INSPECTION, HOLIDAY TESTING AND PROTECTION OF COATING SYSTEM:**

- ✓ **I INSPECTION REQUIRED**
  - Visual Inspection
  - Environmental Conditions
  - Dry Film Thickness
  - Final Cure
  - Holiday Testing & Touch up

#### **Final Inspection**

A Final Inspection will be conducted by the QC Inspector, ASI Superintendent and Project Manager after 48 hours of cure time. A complete visual inspection will be conducted on the applied Coating System to detect defects in the form of cracking, holidays, voids, blisters, pinholes and other detrimental conditions by the QC Inspector. Final cure of the applied topcoat shall be a minimum of fourteen (14) days prior to immersion service. The QC Inspector and ASI Superintendent will perform a Low Voltage Holiday Detection Test on the interior tank coating system. The testing will not be conducted any sooner than 72 hours after the topcoat has been applied. A Tinker Razor Low Voltage Wet Sponge method of NACE SPO188 will be utilized, and properly grounded to the substrate. Holidays, discontinuities will be marked for repair. Defects in the form of low milage, holidays, pinholes, blisters, nicks and dings that have caused discontinuities in the coating system will be marked by the QC Inspector and ASI Superintendent. The QC Inspector and ASI Superintendent will review any deficiencies, revealed during these inspections. Touchup and repairs will be made to small areas that do not expose the steel substrate by brush or daubers depending on the access and location of the repair. Areas found to have exposed steel substrate larger than a dime will be cleaned using a vacuum blast head, pencil blaster so as to not cause additional damage to the surrounding surfaces. If the spot is small (dime size) then the area will be feathered back with #80-#120 emery cloth 2 inches back prior to application of the complete system. Inspection controls will be utilized to ensure that repairs are completed in a neat and uniform fashion to the surrounding surfaces. The brushing shall be done so that a smooth coat of coating material is applied as uniformly as possible is obtain the required coating thickness. The repairs will be completed in accordance with SSPC-PA-1. The on site QC Inspector and ASI Superintendent will continuously monitor the repairs for

compliance. Upon completion of repair work a follow-up Final Inspection will be conducted as stated herein.

#### Protection of Coating System

ASI Quality Control will ensure that inspection personnel, workers will be provided with clean canvas or other approved shoe covers when walking on coated surfaces, regardless of curing time allowed. For heavily trafficked areas, provide cushioned walking mats for additional protection. In addition to using protective measures for occupancy after the coating application ASI will maintain a clean access way that will minimize the possibility of tracking in dirt and debris.

### **15.0 COMPLETION INSPECTIONS**

#### Punch-Out Inspection

Near the completion of work or increment thereof, ASI Superintendent shall notify the Project Manager that a punch list inspection is ready to complete.

#### Pre-Final Inspection

The Project Manager shall ensure that any items noted on the punch list are corrected prior to the Government inspection or Contracting Officers Representative.

#### Final Acceptance Inspection

The Project Manager, QC Inspector, ASI Superintendent, and the Contracting Officers Representative will complete this inspection. Upon completion of the Coating System, a Final Inspection will be conducted. The Final Inspection will consist of a complete visual inspection of the Coating System and property for project Close-Out.

#### Close-Out Documents Submittal

Daily inspection records will be submitted to the Project Manager on a daily basis. Upon final completion of the project, a submittal will be transmitted containing all inspection reports, test, inspections, measurements, non-conformance actions, corrective reports, and other pertinent information.

#### Final Cleanup

Following completion of the coating process work, remove debris, equipment, and materials from the site. Remove temporary connections to Government or Contractor furnished water and electrical services. Leave work areas in a broom clean condition.




### **REFERENCED DOCUMENTS**

The following documents will be accessible for review by the Project Manager, QC Inspector and ASI Superintendent

1. Prime Contract
2. SSPC- QP -1 Library

3. UFGS Section 09 97 13.15, 2011 LOW VOC POLYSULFIDE INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS
4. UFGS Section 09 97 13.27, Exterior Coating of Steel Structures- 01/07
5. UFGS Section 33 52 80, Liquid Fuels Pipeline Coating Systems- 10/07

<b>CONTRACTOR'S SUBMITTAL TRANSMITTAL</b>				CONTRACT NO. N 62583-08-D-0132/0003		TRANSMITTAL NO. 017		DATE 12/18/2012	
FROM CONTRACTOR Willlbros Government Services East 71 <sup>st</sup> Street Tulsa, OK 74136				PROJECT TITLE AND LOCATION Red Hill Tanks 5 and 17  Tank 5 Work Plan A- Abrasive Blasting - Amendment 1					
TO [REDACTED] Specialty Center Acquisitions NAVFAC [REDACTED]									
<b>CONTRACTOR USE ONLY</b>				<b>REVIEWER USE ONLY</b>				<b>GOVT USE ONLY</b>	
List only one specification division per form List only one of the following categories on each transmittal form and indicate which is being submitted <input type="checkbox"/> Contractor Approval <input checked="" type="checkbox"/> Govt Approval <input type="checkbox"/> Deviation/Substitution (Govt Approval)				ACTION CODES A    Approved D    Disapproved AN   Approved as Noted ANR Approved as Noted Resubmit RA   Receipt Acknowledged				ACTION CODES A    Approved D    Disapproved AN   Approved as Noted ANR Approved as Noted Resubmit RA   Receipt Acknowledged	
I T E M	SPEC. SECT. & PARA. and/or DWG. NO.	ITEM IDENTIFICATION (Type, size, model no., Mfg. Name, drawing or brochure number)	NO. OF COPIES	ACTION	REVIEWER'S INITIALS AND DATE	ACTION	GOVERNMENT REPRESENTATIVE INITIALS, CODE AND DATE		
1		Work Plan A - Abrasive Blasting Amendment 1	1						
2		Tank 5 Blasting/Coating schedule update	1						

<b>CONTRACTOR'S SUBMITTAL TRANSMITTAL</b>		CONTRACT NO. N 62583-08-D-0132/0003		TRANSMITTAL NO. 017		DATE 12/18/2012	
FROM CONTRACTOR Willlbros Government Services East 71 <sup>st</sup> Street Tulsa, OK 74136							
TO  Specialty Center Acquisitions NAVFAC 		PROJECT TITLE AND LOCATION Red Hill Tanks 5 and 17  Tank 5 Work Plan A- Abrasive Blasting - Amendment 1					
CONTRACTOR'S CERTIFICATION AND COMMENTS IT IS HEREBY CERTIFIED THAT THE EQUIPMENT AND/OR MATERIAL SHOWN AND MARKED IN THIS SUBMITTAL IS THAT PROPOSED TO BE INCORPORATED INTO THIS CONTRACT, IS IN COMPLIANCE WITH THE CONTARCT DRAWINGS AND SPECIFICATIONS, AND CAN BE INSTALLED IN THE ALLOCATED SPACES.		DATE RECEIVED BY REVIEWER		DATE RECEIVED BY GOVT			
		REVIEWER'S COMMENTS		GOVT COMMENTS			
CONTRACTOR'S REPRESENTATIVE (SIGNATURE)		DATE  12/18/2012		REVIEWER'S SIGNATURE		DATE	
				GOVT REP SIGNATURE		DATE	



# **WORK PLAN -A**

## **SURFACE PREPARATIONS**

**REDHILL TANK NO. 5 COATING**

**COATING OF UNDERGROUND STORAGE TANK**

**OHAU**

**Purchase Order No. 54118-042-00**

**UFGS Specification 09 97 13.15**

**LOW VOC POLYSULFIDE INTERIOR COATING OF  
WELDED STEEL PETROLEUM FUEL TANKS**

**Date: June 22, 2012**

**ASI Job No.**

*Abhe & Svoboda, Inc. An Equal Opportunity Employer*





## **ABHE & SVOBODA INC.**

17066 Revere Way, Prior Lake, MN 55372  
Ph: (952) 447-6025; Fax: (952) 447-1000

91-161 Olai Street, Kapolei, HI 96707  
Ph: (808) 682-4833; Fax: (808) 682-0780

December 19, 2012

To: WILLBROS Government Services

From: Abhe & Svoboda, Inc.

Reference: Tank Coating Services - Redhill Fuel Complex, Tank 5

Subject: Fabricated Dust Unit

Mr. Gilbert:

Below is a list of proposed materials and equipment that Abhe & Svoboda, Inc. intends to use to fabricate a dust unit to complete the abrasive blasting of Tank No. 5:

1. Blower: 20,000 cfm, 20 to 25 hp motor, approx. 28 amps
2. Filter Cartridges: 8.5" dia. X 36.5" tall with 21,600 in<sup>2</sup> of Filter Media Surface Area
3. 3/4" Structural Grade Plywood (BB Struc 1)
4. 4"x4" Corner posts
5. 2"x4" Framing and Internal Bracing
6. Dust Unit Suction Line (This is currently in place from the original set-up)
7. Dust Sock for Blower Exhaust
8. Spray Foam and Caulking for Sealing of Seams

Thank You,

Nick Schmid  
Area Manager

**Red Hill Tank 5  
Work Plan A – Abrasive Blasting  
Amendment 1  
December 18, 2012**

Replace Section 1.1.2 of Work Plan A – Abrasive Blasting dated June 22, 2012 with the following:

**PROPOSED CHANGES TO TANK 5 DUST COLLECTION EQUIPMENT**

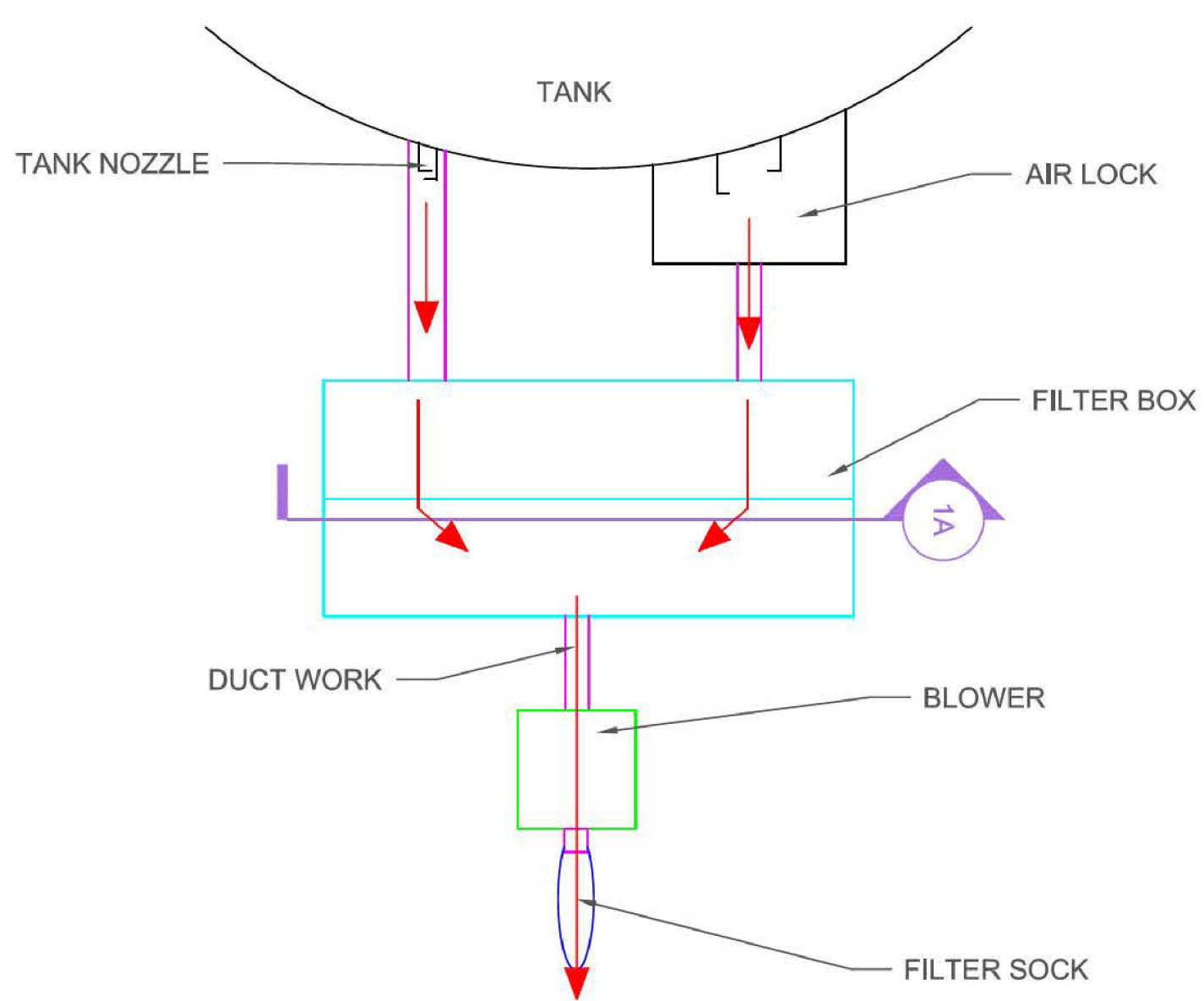
During the course of the abrasive blasting operation in Red Hill Tank 5, it became necessary for Abhe & Svoboda to return the three DC 5000 E dust collection units which had been rented for the project. This caused an unanticipated delay in the completion of the blasting operations. After an extensive search for suitable replacement equipment, it was determined that such equipment did not exist and that no other equipment could be retrofitted to meet the air flow capacity and extremely limited dimensional requirements presented by the Red Hill complex.

Abhe & Svoboda determined that the only practical solution which would allow the blasting operations to resume quickly was to custom build a dust collection system that could be transported into the lower tunnel and assembled in place at Tank 5.

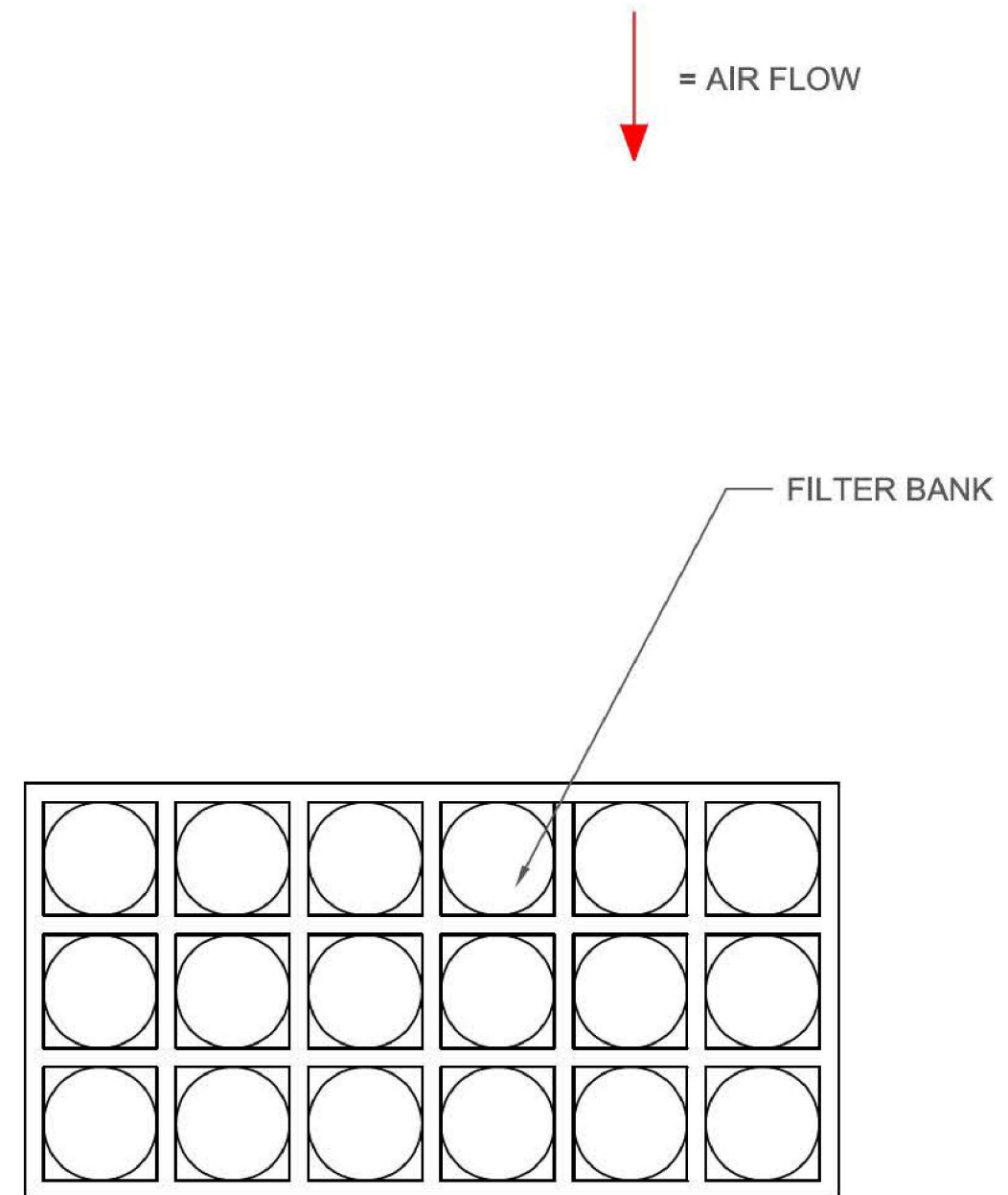
The proposed system will consist of two existing ducts running to a structural plywood cabinet housing 18 HEPA filters. The plywood box will be constructed around a 4x4 lumber frame and internally braced with 2x4 lumber supports (the previous dust collection system included a plywood plenum which was not as heavily constructed as the proposed unit which performed without problem under the same vacuum pressures that the new box will be exposed to). A 20-25 hp blower motor rated at 28 amps will provide approximately 20,000 cfm of air flow across the filters. A filter sock will be placed on the blower discharge to help disperse air flow (this should help eliminate stirring up dust from the tunnel repair operations located adjacent to Tank 5).

Air quality will be monitored inside the tank and at the dust collector blower discharge as it was with the previous dust collection system.

A functional test of the unit will be performed prior to resuming blasting operations.



1 FILTER BOX PLAN VIEW  
NO SCALE



1A FILTER BOX CUT SECTION  
NO SCALE

	SHEET DESCRIPTION: <b>PROPOSED VENTILATION DETAIL</b>		
	DRAFTER: DL	CONTRACT TITLE: COATING OF RED HILL TANK NO. 5	ASI JOB NO. 12008
	DATE: 12-18-12	PROJECT NO: PO#54118-042-00	DWG NO. 001
	CHECKED: DATE:		

91-161 OLAI STREET, KAPOLEI, HI 96707  
PH: (808) 682-4833, FAX: (808) 682-0780

ID	Task Name	Duration	Start	Finish	Predecessors	23, '12
1	Red Hill Tank No. 5 Coating	50 days	Thu 12/27/12	Fri 2/22/13		M T W T F S
2	Fabrication, Mobilization, and Setup of New Dust Collection System	15 days	Thu 12/27/12	Mon 1/14/13		
3	Abrasive Blasting (24hr shifts) Added a day for unknown	5 days	Tue 1/15/13	Sat 1/19/13	2	
4	<b>Ventilate Tank to remove dust. In order to prep tank for coating</b>	<b>2 days</b>	<b>Sun 1/20/13</b>	<b>Mon 1/21/13</b>	3	
5	First Coat Application (24hrs)	2 days	Tue 1/22/13	Wed 1/23/13	4	
6	Cure Time for First Coat (3 calendar days)	3 days	Thu 1/24/13	Sat 1/26/13	5	
7	Second stripe Coat Application (24hrs) Will need to stripe on sunday also	3 days	Sun 1/27/13	Tue 1/29/13	6	
8	Cure Time for 2nd Stripe Coat (3 calendar days)	3 days	Wed 1/30/13	Fri 2/1/13	7	
9	Apply 2nd Full coat (1st paint applied 1/22)	2 days	Sat 2/2/13	Sun 2/3/13	8	
10	Allow 2nd Full Coat to Cure (3 calendar days)	3 days	Mon 2/4/13	Wed 2/6/13	9	
11	Holiday Detection (tentative)	2 days	Thu 2/7/13	Fri 2/8/13	10	
12	Touch-ups (tentative)	1 day	Mon 2/11/13	Mon 2/11/13	11	
13	Tear Down of Equipment (tentative)	4 days	Tue 2/12/13	Fri 2/15/13	12	
14	Removal of Equipment (Tentative)	5 days	Mon 2/18/13	Fri 2/22/13	13	

Project: Expedited start up 21 Schedul  
Date: Tue 12/18/12

Task

Split

Milestone

Summary

Project Summary

External Tasks

External Milestone

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

Progress

Deadline

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