

INVITATION FOR BIDS

**SAN FRANCISCO BAY AREA
WATER EMERGENCY TRANSPORTATION AUTHORITY**

**NORTH BAY OPERATIONS AND MAINTENANCE
FACILITY – PILE RECONFIGURATION PROJECT**

IFB #17-020

VOLUME 3

DIVISION 2

SITE WORK

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SECTION 09 96 00

MARINE COATINGS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. The work includes the requirements for marine coatings on new steel pipe piles and pile hats.

1.3 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)
1. ACGIH 0100Doc (2005) Documentation of the Threshold, Limit Values and Biological Exposure Indices
- C. ASTM INTERNATIONAL (ASTM)
1. ASTM A 123 Standard Specification for Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
 2. ASTM A 780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dipped Galvanized Coatings
 3. ASTM D 2092 (1995; R 2001e1) Standard Guide for Preparation of Zinc-Coated (Galvanized) Steel Surfaces for Painting
 4. ASTM D 4444 (2008) Use and Calibration of Hand-Held Moisture Meters
 5. ASTM D 523 (2008) Standard Test Method for Specular Gloss
 6. ASTM F 1182 (2013) Standard Specification for Anodes, Sacrificial Zinc Alloy
- D. MASTER PAINTERS INSTITUTE (MPI)
1. MPI 107 (Oct 2009) Rust Inhibitive Primer (Water-Based)
 2. MPI 11 (Oct 2009) Exterior Latex, Semi-Gloss, MPI Gloss Level 5
 3. MPI 23 (Oct 2009) Surface Tolerant Metal Primer
 4. MPI 26 (Oct 2009) Cementitious Galvanized Metal Primer
 5. MPI 50 (Oct 2009) Interior Latex Primer Sealer
 6. MPI 54 (Oct 2009) Interior Latex, Semi-Gloss, MPI Gloss Level 5
 7. MPI 79 (Oct 2009) Alkyd Anti-Corrosive Metal Primer
 8. MPI 9 (Oct 2009) Exterior Alkyd, Gloss, MPI Gloss Level 6
 9. MPI 94 (Oct 2009) Exterior Alkyd, Semi-Gloss, MPI Gloss Level 5
- E. NACE International
1. NACE SP0108 (2008) Corrosion Control of Offshore Structures by Protective Coatings
- F. THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)
1. SSPC PA 1 (2000; E 2004) Shop, Field, and Maintenance Painting of Steel
 2. SSPC PA Guide 3 (1982; E 1995) A Guide to Safety in Paint Application
 3. SSPC QP 1 (1998; E 2004) Standard Procedure for Evaluating Painting Contractors (Field Application to Complex Industrial Structures)
 4. SSPC SP 1 (1982; E 2004) Solvent Cleaning
 5. SSPC SP 2 (1982; E 2004) Hand Tool Cleaning
 6. SSPC SP 3 (1982; E 2004) Power Tool Cleaning

- 7. SSPC SP 6/NACE No.3 (2007) Commercial Blast Cleaning
- G. U.S. ARMY CORPS OF ENGINEERS (USACE)
 - 1. EM 385-1-1 (2008) Safety and Health Requirements Manual
- H. U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
 - 1. EPA Method 24 (2000) Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings
- I. U.S. GENERAL SERVICES ADMINISTRATION (GSA)
 - 1. FED-STD-313 (Rev D; Am 1) Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities
- J. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
 - 1. CFR 1910.1000 Air Contaminants

1.4 SUBMITTALS

- A. The following shall be submitted according to submittal Procedures: Shop Drawings
 - 1. Description of coating system.
 - 2. Part identification
 - 3. Submit color stencil codes
- B. Product Data
 - 1. Manufacturer's Technical Data Sheets
 - 2. Sealant
- C. Samples
 - 1. Submit manufacturer's samples of paint colors. Cross reference color samples to color scheme as indicated.
- D. Certificates
 - 1. Applicator's qualifications
 - 2. Qualification Testing laboratory for coatings
- E. Manufacturer's Instructions
 - 1. Application instructions
 - 2. Mixing: Detailed mixing instructions, minimum and maximum application temperature and humidity, potlife, and curing and drying times between coats.
 - 3. Manufacturer's Material Safety Data Sheets
 - 4. Submit manufacturer's Material Safety Data Sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.
- F. Operation and Maintenance Data
 - 1. Coatings
 - 2. Preprinted cleaning and maintenance instructions for all coating systems shall be provided.

1.5 CONTRACTOR'S QUALIFICATIONS

- A. Contractor Qualification

1. Submit the name, address, telephone number, and e-mail address of the contractor that will be performing all surface preparation and coating application. Submit evidence that key personnel have successfully performed similar work on a minimum of three similar projects within the past three years. List information by individual and include the following:
 - a. Name of individual and proposed position for this work.
 - b. Information about each previous assignment including:
 - 1) Position or responsibility
 - 2) Employer (if other than the Contractor) Name of facility owner
 - 3) Mailing address, telephone number, and telex number (if non-US) of facility owner Name of individual in facility owner's organization who can be contacted as a reference
 - 4) Location, size and description of structure
 - 5) Dates work was carried out
 - 6) Description of work carried out on structure

B. SSPC QP 1 Certification

1. All contractors and subcontractors that perform surface preparation or coating application shall be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council) (SSPC) to the requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. The painting contractors and painting subcontractors must remain so certified for the duration of the project. If a contractor's or subcontractor's certification expires, the firm will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply.

1.6 QUALITY ASSURANCE

A. Sampling Procedure

1. The Owner's Representative will select paint at random from the products that have been delivered to the job site for sample testing. The Contractor shall provide one quart samples of the selected paint materials. The samples shall be taken in the presence of the Owner's Representative, and labeled, identifying each sample. Provide labels in accordance with the paragraph "Packaging, Labeling, and Storage" of this specification.

B. Testing Procedure

1. Provide Batch Quality Conformance Testing for specified products, as defined by and performed by MPI. As an alternative to Batch Quality Conformance Testing, the Contractor may provide Qualification Testing for specified products above to the appropriate MPI product specification, using the third-party laboratory approved under the paragraph "Qualification Testing" laboratory for coatings. The qualification testing lab report shall include the backup data and summary of the test results. The summary shall list all of the reference specification requirements and the result of each test. The summary shall clearly indicate whether the tested paint meets each test requirement. Note that Qualification Testing may take 4 to 6 weeks to perform, due to the extent of testing required.
2. Submit name, address, telephone number, FAX number, and e-mail address of the independent third party laboratory selected to perform testing of coating samples for compliance with specification requirements. Submit documentation that laboratory is regularly engaged in testing of paint samples for conformance

with specifications, and that employees performing testing are qualified. If the Contractor chooses MPI to perform the Batch Quality Conformance testing, the above submittal information is not required, only a letter is required from the Contractor stating that MPI will perform the testing.

1.7 REGULATORY REQUIREMENTS

- A. Environmental Protection
 - 1. In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the local Air Pollution Control District and regional jurisdiction. Notify Owner's Representative of any paint specified herein which fails to conform.
- B. Lead Content
- C. Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.
- D. Chromate Content
 - 1. Do not use coatings containing zinc-chromate or strontium-chromate.
- E. Asbestos Content
 - 1. Materials shall not contain asbestos.
- F. Mercury Content
 - 1. Materials shall not contain mercury or mercury compounds.
- G. Silica
 - 1. Abrasive blast media shall not contain free crystalline silica.
- H. Human Carcinogens
 - 1. Materials shall not contain ACGIH 0100Doc confirmed human carcinogens (A1) or suspected human carcinogens (A2).

1.8 PACKAGING, LABELING, AND STORAGE

- A. Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F.

1.9 SAFETY AND HEALTH

- A. Apply coating materials using safety methods and equipment in accordance with the following:
 - 1. Work shall comply with applicable Federal, State, and local laws and regulations.
- B. Safety Methods Used During Coating Application
 - 1. Comply with the requirements of SSPC PA Guide 3.

- C. Toxic Materials
 - 1. To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:
 - a. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.
 - b. 29 CFR 1910.1000.
 - c. ACGIH 0100Doc, threshold limit values.

1.10 ENVIRONMENTAL CONDITIONS

Comply, at minimum, with manufacturer recommendations for space ventilation during and after installation.

- A. Coatings
 - 1. Do not apply coating when air or substrate conditions are:
 - a. Less than 5 degrees F above dew point;
 - b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Owner's Representative and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

1.11 LOCATION AND SURFACE TYPE TO BE PAINTED

- A. Painting Included
 - 1. Where a space or surface is indicated to be coated, include the following unless indicated otherwise.
 - a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.
 - b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.
 - c. Existing coated surfaces that are damaged during performance of the work.
 - 2. Exterior Coating
 - a. Includes new external surfaces of the piles and appurtenances except where excluded.
 - 3. Definitions and Abbreviations
 - a. Qualification Testing
 - 1) Qualification testing is the performance of all test requirements listed in the product specification. This testing is accomplished by MPI to qualify each product for the MPI Approved Product List, and may also be accomplished by Contractor's third party testing lab if an alternative to Batch Quality Conformance Testing by MPI is desired.
 - b. DFT
 - 1) Dry film thickness (DFT), the film thickness of the fully cured, dry paint or coating.
 - c. MPI Gloss Levels
 - 1) MPI system of defining gloss. Seven (7) gloss levels (G1 to G7) are generically defined under the Evaluation sections of the MPI Manuals. Traditionally, Flat refers to G1/G2, Eggshell refers to G3, Semigloss refers to G5, and Gloss refers to G6.
 - 2) Gloss levels are defined by MPI as follows:

| Gloss Level | Description | Units at 60 Degrees | Units at 85 Degrees |
|-------------|---------------|---------------------|---------------------|
| G1 | Matte or Flat | 0 to 5 | 10 max |
| G2 | Velvet | 0 to 10 | 10 to 35 |
| G3 | Eggshell | 10 to 25 | 10 to 35 |
| G4 | Satin | 20 to 35 | 35 min |
| G5 | Semi-Gloss | 35 to 70 | |
| G6 | Gloss | 70 to 80 | |
| G7 | High Gloss | | |

- 3). Gloss is tested in accordance with ASTM D 523. Historically, the Government has used Flat (G1 / G2), Eggshell (G3), Semi-Gloss (G5), and Gloss (G6).
- d. MPI System Number
 - 1) The MPI coating system number in each Division found in either the MPI Architectural Painting Specification Manual or the Maintenance Repainting Manual and defined as an exterior (EXT/REX) or interior system (INT/RIN). The Division number follows the CSI Master Format.
- e. Paint
 - 1) See Coating definition.
- f. REX
 - 1) MPI short term designation for an exterior coating system used in repainting projects or over existing coating systems.
- g. RIN
 - 1) MPI short term designation for an interior coating system used in repainting projects or over existing coating systems.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, Devoe, Tnemec, Sherwin Williams or approved equal.

2.2 MATERIALS

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and relate materials that are compatible with one another and the substrates indicated under conditions of service and application.
- B. Material Quality: Provide best quality grade of coatings as regularly manufacture by acceptable paint materials manufacturers. Materials not displaying manufacturer's identifications as a standard, best-grade product will not be acceptable.

2.3 COLORS

- A. Colors shall match color chips furnished by the Owner's Representative. At least 15-percent of required colors may be deep tone colors
- B. Colors of paints, including shades of stain, shall match color samples approved by the Owner's Representative.

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED

- A. Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.2 SURFACE PREPARATION

- A. Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

3.3 APPLICATION

- A. Coating Application
 1. Coating practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates, except as modified herein.
 2. At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.
 3. Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Use trigger operated spray nozzles for water hoses.
 4. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated. Wear protective clothing and respirators when applying oil-based paints or using spray equipment with any paints.
 5. Coatings, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.
 6. Thoroughly work coating materials into joints, crevices, and open spaces. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.
 7. Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete.

8. Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material.
 - a. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.
 - b. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.
 - c. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

- B. Mixing and Thinning of Paints
 1. Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory to suit surface, temperature, weather conditions, application methods, or for the type of paint being used. Obtain written permission from the Owner's Representative to use thinners. The written permission shall include quantities and types of thinners to use.
 2. When thinning is allowed, paints shall be thinned immediately prior to application with not more than 1 pint of suitable thinner per gallon. The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

- C. Coating Systems
 1. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise. Coating thickness where specified, refers to the minimum dry film thickness.
 2. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

- D. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:
 1. One coat of primer.
 - b. One coat of undercoat or intermediate coat. (3) One topcoat to match adjacent surfaces.

- E. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers and fillers need not be provided on surfaces where existing coatings are soundly adhered and in good condition. Do not omit undercoats or primers.

3.4 COATING SYSTEMS FOR METAL

- A. Apply coatings for Exterior and Interior.
 1. Apply specified ferrous metal primer on the same day that surface is cleaned, to surfaces that meet all specified surface preparation requirements at time of application.

2. Inaccessible Surfaces: Prior to erection, use one coat of specified primer on metal surfaces that will be inaccessible after erection.
3. Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.

3.5 PAINT TABLES

All DFT's are minimum values.

- A. New steel surfaces including external pile surfaces:
 1. Ultra-high solids epoxy amine
System DFT: 35 mils
System DFT: 5 mils

END OF SECTION

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SECTION 31 62 16

STEEL PILES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. General:
 - 1. The work includes the requirements for furnishing, transporting, handling, storing, removing and installing steel piling in accordance with the Project Drawings and Specifications.
 - 2. The required work included the following:
 - a. Installation of two new vessel impact piles.
 - b. Removal and reinstallation of one steel pipe pile.
 - c. Installation of one new fender pile.
 - d. Removal and reinstallation of two donut fenders.
 - e. Installation of two solar-powered navigation lights and bird spike.
 - 3. This specification is intended to cover requirements for marine steel pipe piles for the fender monopiles and vessel impact piles at the Ferry Maintenance and Operations Facility.
- B. Refer to Division 0 and Division 1 for additional information on construction requirements, responsibilities and procedures.
- C. The Contractor shall confirm final exact location of all piles with Operations staff prior to start of work.
- D. Geotechnical record information indicates the presence of hard subsurface material at the project site which may impact pile installation. Spudding or pre-drilling may be required in order to install the piles at this location. The Contractor shall anticipate difficult driving conditions at this location.

1.2 JOB CONDITIONS

- A. The Contractor shall remove and install piles at the designated locations as shown on the Project Drawings. In the event that pile cannot be installed (in the opinion of the Owner's Representative) due to subsurface obstructions, the Owner's Representative may require that the pile be pulled, repositioned and redriven or redrilled.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report represent interpretations of subsoil conditions, tests, and results of analyses conducted by the Owner's Geotechnical Engineer. Owner will not be responsible for interpretations or conclusions drawn from the data.
 - 1. The Contractor shall make additional test borings and conduct other exploratory operations necessary as deemed necessary for pile installation.
- C. Pile driving activities are restricted to occur between dates indicated on the permit documents.

1.3 QUALITY ASSURANCE

- A. The Contractor shall facilitate and assist in keeping a complete and current record of

each pile installed, noting the make, model, weight, dynamic force, frequency or range of frequencies, maximum eccentric moment, clamping method, pile size and length, pile penetration rate during driving, and total pile penetration below the mudline. Facilitate and assist shall include, but not be limited to, providing access to the pile driving site, providing visual access to the pile during driving, and access to driving records. Data shall be recorded on a "Pile Driving Record Sheet". The Contractor shall mark the piles at one foot intervals beginning at the tip, and the length shall be clearly marked at each five-foot division. At all times during driving, the marked portion of the pile shall remain visible to the Owner's Representative.

- B. It is the Contractor's responsibility to install in an acceptable condition and location all the piles to the minimum tip (and cut-off) elevations indicated on the Project Drawings. The Contractor shall operate the hammer and monitor the clamping system so that piles can be installed without damage.
- C. Provide skilled workman at all times who shall be experienced and familiar with construction of pile supported marine structures. Supervisory personnel shall have a minimum of five (5) years of experience with the Work performed in this Section.
- D. Work shall comply with all municipal, state and federal regulations regarding safety, including all applicable portions of OSHA and Cal/OSHA standards for construction work.
- E. Reference Standards:
 - 1. American Society for Testing and Materials
 - 2. American Welding Society, "Structural Welding Code-Steel," AWS D1.1
 - 3. American Petroleum Institute, API, Specification 5L, January 2000

1.4 SUBMITTALS

- A. Steel Piling:
 - 1. Pile Mill Certifications: Pile mill certificates shall be provided for all piling. Mill certificates shall indicate that all piles are in conformance with Item 2, "Products," of this Section.
 - 2. Records verifying fabrication/erection inspection and NDT test conformance.
 - 3. Shop Drawings for all piling.
 - 4. A list of driving equipment
Description of pile driving equipment to be employed in the work, prior to commencement of pile installations; including details of the pile hammer, power plant, leads, and cushion material, and bubble curtain if required.
 - 5. Driving procedures.
 - 6. A list of all drilling equipment
 - 7. Qualification Data: Land Surveyor must be licensed in the state of California.

1.5 PRODUCT HANDLING

- A. Steel Piles:
 - 1. Protection
 - a. Piles in storage shall be supported in such a manner that will not impair the alignment of the piles.
 - b. Piles shall be handled and transported only with acceptable equipment and by qualified personnel.
 - 2. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner's Representative at no additional cost.
 - 3. Dents, gouges, or arc strikes in the piling greater than 1/8-inch shall be removed

or repaired as required under AWS. Pile deficiencies greater than 1/8-inch will be rejected, and the pile shall be removed from the site and replaced at no additional cost.

1.6 PERMIT REQUIREMENTS

- A. The Contractor shall comply with the terms, conditions and mitigation requirements of all permits and governmental approvals pertaining to this work.
- B. Unless otherwise noted, the Contractor shall be responsible for meeting all permit conditions and performing all required mitigation monitoring and reporting to minimize impacts to marine mammals and other species. Permit condition mitigation/conservation measure requirements for the Contractor to note for piling driving activities include, but are not limited to, the following:
 - 1. Allowable in-water work window and daylight work requirements
 - 2. Noise/energy attenuation
 - 3. Underwater acoustic measurements and sound level monitoring, including hydroacoustic monitoring plan
 - 4. Establishment and monitoring of Level B Harassment Zones of Influence for Marine Mammals
 - 5. Visual marine mammal monitoring by NMFS-approved protected species observers (PSOs), and other similar service-approved biologist training sessions and species surveys
 - 6. Shutdown Measures
 - 7. Data collection and compliance reporting

1.7 BASIS FOR PAYMENT

- A. The Contractor shall furnish a price which includes all necessary equipment, tools, material, labor, and supervision required to: deliver, handle, removing and installation, weld steel plate pipe cap, re-install donut fender, cut off new piles; and meet the applicable contract requirements. Payment for piles will be on the basis of the lengths of the piles measured from cut off elevations to final tip elevations. No additional payment will be made for: damaged, rejected, or misplaced piles; withdrawn piles; any portion of a pile remaining above the cut off elevation; extending piles 5 feet or less below plan tip elevation; augering rock to achieve rock embedment length; furnishing and attaching pile shoes; cutting off piles; or disposal of cut off length of piles.

PART 2 PRODUCTS

2.1 STEEL PILES

- A. The Contractor shall be responsible for furnishing steel piles in accordance with the following requirements:
 - 1. Steel Piles
 - a. Minimum order lengths for steel piles shall equal the length of the pile from tip elevation to cutoff elevation plus 5 feet.
 - b. Steel piling shall conform to API and ASTM requirements, and minimum yield strengths as indicated on the drawings.
 - c. Steel pipe piles shall be manufactured to the outside diameter and wall thickness listed in the plans.
 - d. Fabrication/erection inspection requirements for pipe piles at the manufacturing plant are as follows:
 - 1) One hundred percent of the length of each circumferential butt splice weld joining lengths of pipe shall be nondestructively tested (NDT) by either radiographic, radiosopic, real time imaging systems, or

ultrasonic methods that are in conformance with the requirements of AWS D1.1.

- 2) The acceptance and repair criteria shall conform to the requirements of AWS D1.1, Section 6, for tension, cyclically-loaded, non-tubular connections.
 - 3) If repairs are required in a portion of the weld, additional NDT shall be performed. The additional NDT shall be made on both sides of the repair for a length equal to 10 percent of the length of the pipe outside circumference and on an additional 10 percent of the total length of the weld on the piece of pipe inspected. If additional weld defects are found, 100 percent of the length of the weld on the steel pipe pile shall be nondestructively inspected in conformance to the procedures noted above.
 - 4) The Contractor shall be responsible for performing fabrication/erection inspection at the pile manufacturing plant, as defined above, and all costs associated with such performance shall be incidental to furnishing steel pipe piles.
 - 5) At the Contractor's option, inspection will be witnessed by the Contractor's Welding Inspector in conformance with the requirements of API 5L, Appendix H.
 - 6) Records verifying that this testing was accomplished and that all tested welds were in conformance with these specifications shall be submitted with the manufacturers' mill certificate.
- a. All steel shall be protected on the exterior only from top of pile to at least 10 feet below the mudline using marine epoxy coating per Specifications Section 09 96 00.
 - b. Repair all coated surfaces removed or damaged during shipping or handling.

PART 3 EXECUTION

3.1 GENERAL

- A. Drive all piling to the tip elevation or to practical refusal. Practical refusal shall be defined as a penetration rate of 30 blows for 4 inches of driving.
- B. Installation Tolerances: Install piles within the following maximum tolerances: (any pile deviated in final position more than the limits specified will be automatically rejected.)
 1. A final lateral deviation from the correct location at the cutoff elevation of not more than 2 inches will be permitted for vertical piles. Manipulation of piles to meet tolerances will not be permitted. Plumb piles shall be installed within 1% of vertical.
- C. Pile lengths of 60 feet or more shall be handled and driven carefully to prevent overstress or leaning from a true position. The pile-driving rig shall have sufficiently rigid supports so that the leads remain accurately aligned. Templates or guide frames shall be erected at or close to the water surface. Float guide piles may be driven through the pile hoops.
- D. Rejected Piles
 1. Any pile driven out of alignment beyond the maximum tolerances, or found to be, in the judgment of the Owner's Representative, damaged beyond reasonable repair, shall be rejected and another pile shall be driven at no additional cost. The pile rejected may or may not be extracted. If, in the sole opinion of the Owner's Representative, damage to adjacent piling or structures would result from the pile's extraction, it will remain in place and another pile

- shall be driven in a position designated by the Owner's Representative.
- 2. Remedial work required to complete the pile installation or to accommodate piles misaligned shall be performed as directed by the Owner's Representative. No additional payment will be made for such remedial work. Schedule impacts associated with remedial work shall be the responsibility of the Contractor. The Contractor shall perform any required work acceleration to return to the accepted schedule at no additional cost.
- 3. Lateral pulling of pile heads to proper location will not be allowed under any circumstances.

3.2 STEEL PILING

- D. Handling: Move steel piling by the use of "bridles," "strong backs," or other appropriate rigging which will prevent permanent deformations.
- E. Driving:
 - 1. Pipe Piling:
 - a. Drive steel pipe piling in true line and position with an impact hammer. Pile driving hammer shall be selected by the Contractor and shall be suitable for driving the piling in a satisfactory manner to the indicated tip elevations and without overstressing the pile. The Contractor shall be prepared to handle unexpected soft soils as well as stiff or hard driving conditions. The Contractor shall develop determine the type and size of hammer to use for pile installation. The Contractor shall also provide a wave equation (WEAP) analysis verifying that the adequacy of the selected hammer. The piles shall be plumb prior to driving. Take care during driving to prevent any tendency of the piles to twist or rotate. The hammer shall be equipped with a suitable clamping system to fit the pile being driven and the hammer being used.
 - b. "Proofing" of the piling is not required.
 - 2. Timing:
 - a. Piles driven in the water must be driven in compliance with all permits, which may restrict driving to certain days of the year, time of day, and if certain animals are present or not.
 - 3. Noise attenuation:
 - The Contractor shall design and install a bubble curtain for noise attenuation during impact pile driving as required by the permits.
 - 4. Comply with all terms, conditions and mitigation requirements of all permits and governmental approvals.
- F. Cutoff
 - 1. Cut off steel piling at appropriate elevations. Fresh head all piles after driving. Use templates or other devices after the piling has been located in its final alignment to ensure that the cutoff will be true and level.
- G. Delays: Delays/interruption in driving a pile to the required tip elevation shall be minimized as much as possible to prevent potential setup and/or refusal. Total active pile driving time for piles driven in the water may be limited by the permits. Pile driving may be interrupted if required by the permits.
- H. Jetting: Pile jetting is not permitted.

3.3 GUIDE PILE CAPS

- A. Install fabricated steel cone hats on the tops of all dolphin and vessel impact piles. Cone

hats shall be minimum ¼" thickness and coated to match piles.

3.4 AS-BUILT PILE LOCATION:

- A. Plan location of piling as-built shall be surveyed by the Contractor and a written as-built location plan of each pile shall be submitted to the Owner's Representative within 72 hours of completion of pile installation operations.

END OF SECTION