

TECHNICAL SPECIFICATIONS

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END OF SECTION

SECTION 01010
DESCRIPTION OF WORK

PART 1 GENERAL

1.01 SUMMARY OF CONTRACT WORK

- A. The work included in this Contract is defined on the Contract Drawings, and within Specifications organized under the following Division Numbers:
1. Division 00 – Bidding and Contract Requirements
 2. Division 01 – General Requirements
 3. Division 02 – Site Work
 4. Division 05 – Metals
 5. Division 16 - Electrical
- B. The work under this Contract is to furnish all labor, equipment and materials as required to complete the Contract Work described in the Contract Documents. Contract work generally includes the following:
1. Prepare required submittals and attend required meetings with the Owner and regulatory agencies as required by permits for the project.
 2. Mobilize to the site.
 3. Implement temporary site controls including traffic controls and marine environmental/water quality controls
 4. Demolish and remove (or salvage, as specified in the plans) existing docks, piles, one gangway and miscellaneous existing utilities and appurtenances as identified in the contract drawings.
 5. Establish and maintain a sequencing plan and implement temporary staging for access to open marina floats and establish and maintain temporary electrical service throughout construction activities.
 6. Furnish and install new floating docks.
 7. Furnish and install new ADA gangway and approach pier.
 8. Furnish and install new utilities (electrical, lighting, and water) on floating docks.
 9. Furnish and install life rings, fire hose cabinets, fire extinguishers, safety ladders and 911 call boxes on floating docks.
 10. Demobilize equipment, labor, temporary facilities and unused materials from the site.
 11. Other work required to complete the primary tasks identified above and described in the Contract Documents.

1.02 PARTY DEFINITIONS

- A. Owner: City of Depoe Bay
- B. Owner's Representative(s): Person or persons as designated by Owner at time of Notice to Proceed to represent the Owner in contractual matters.
- C. Owner's Tenants: Users of the City's relevant facilities
- D. Contractor: General contractor engaged in a Contract with the Owner as provided with Notice to Proceed
- E. Subcontractor/Supplier: Anyone subcontracted by Contractor related to this project
- F. Engineer: Engineer of Record

1.03 COOPERATION WITH OTHERS

- A. The project Site is an active harbor. The Owner, the Owner's Representative and Owner's tenants will require access to areas of the harbor facilities during construction. The Contractor shall not block vessel navigation into the harbor or actively operating areas within the harbor basin without advance approval by the Owner. The Contractor shall work with the Owner to minimize impacts to these operations and coordinate work to ensure continued, on-going harbor operations. Coordination with the Owner is required to relocate vessels and provide access to moorage slips within the project area. The coordination of the Work shall be taken into account by the Contractor and any resulting costs shall be incidental and included within the unit Bid prices in the Contract.

1.04 WORK TO BE PERFORMED BY THE OWNER

- A. The Owner will administer the Contract; monitor, observe, approve, and accept the work; coordinate with regulatory agencies; provide required direction for the work when Contractor requests clarification of the intent of the Contract Documents; and generally, ensure that the execution and completion of the work meets design, construction, and other requirements of the Contract Documents. General tasks that will be accomplished by the Owner, Owner's representatives, and others at the Site during the Contract work will include:
 1. Monitoring and reviewing work performed by the Contractor to ensure that the execution and completion of the work meets design, construction, and other requirements of the Contract Documents.
 2. Providing required direction for the work when Contractor requests clarification of the intent of the Contract Documents.
 3. Coordinating with the Oregon State Department of Ecology, United States Army Corps of Engineers, Oregon Department of Natural Resources (DNR), City of Depoe Bay and other regulatory agencies, as required.
 4. Obtaining permits for the project that are identified below.

1.05 SEQUENCING/SCHEDULE CONSTRAINTS

- A. Contractor shall provide and maintain authorized tenant pedestrian access at all times to the floats outside of the work area. The contractor shall temporarily stop operations to allow for the

safe passage of pedestrians through the work area. Disruptions resulting from pedestrian access shall not result in changed conditions or provide basis for delay claims.

1.06 PERMITS

- A. The Owner has obtained the following permits for construction tasks identified in the Contract Documents. These permits individually and collectively contain several conditions that will impact the means and methods available for use by the Contractor. Prior to bidding, the Contractor shall review these permits to familiarize themselves with the conditions identified. The permits for the project include:

1. United States Army Corps of Engineers Section 10 Individual Permit (permit # NWP-2016-23 – pending);
2. State Environmental Policy Act (SEPA) Mitigated Determination of Non-Significance (MDNS);
3. Oregon Department of Fish and Wildlife Hydraulic Project Approval (HPA permit # 2017-5-6+01);
4. City of Depoe Bay Shoreline Substantial Development Permit Exemption; and
5. Oregon State Department of Labor & Industries Electrical Permit

- B. These permit documents are included in the Reference Section of the bid package. The Contractor is responsible for securing and paying for all other permits and licenses that may be applicable to the work under this Contract.
- C. The Contractor shall review the requirements of all permits/substantive requirements and shall ensure that the Contract Work is executed in accordance with the permit requirements.
- D. Any fines resulting from the Contractor's inability to comply with project permit conditions shall be the responsibility of the Contractor. Payment of fines, if applicable, shall be deducted from the amount due or to become due to the Contractor.

1.07 WORK RESTRICTIONS

- A. Normal work hours are during daylight hours (7:00 am to 7:00 pm), such that excessive noise will not be generated. Work hours established by any applicable ordinance, law, or regulations will supersede the normal work hour requirements specified. Contractor shall provide adequate lighting at all times as deemed necessary by the Owner for safety reasons.
- B. All work shall be conducted Monday through Friday, excluding holidays. Any variation from normal work hours or work on weekends or holidays will be subject to approval by the Owner. Contractor shall submit notice to the Owner no less than 48 hours prior to requesting any necessary variation from normal work hours.

1.08 CONTRACTORS USE OF PREMISES:

- A. The Contractor shall confine all operations to the designated areas of the Site as shown on the Contract Drawings, or as otherwise approved in writing by the Owner. Contractor shall be responsible for arranging for, and paying the costs of any necessary off-site storage.

- B. The Contractor shall be responsible for the security and safety of Contractor's equipment and facilities. Owner and the Owner's Representative will not be liable for loss or damage of Contractor's tools, vehicles, equipment, or materials, whatever the cause.
- C. The Contractor shall maintain their operations at all times and conduct the work and position the barges and equipment in a manner that ensures passage of boat traffic. Channels/fairways shall not be blocked without prior authorization from the Owner.
- D. The Contractor shall install and maintain temporary lights, navigation lights, warning signs, barricades, buoys and other items necessary to protect the public and harbor tenants from injury at the site per the applicable rules and regulations.
- E. The Contractor shall be responsible for any damage to docks, piles, roadways, facilities, trees or other structures on, or adjacent to, the Site due to negligence, carelessness, actions, errors or omissions on the part of the Contractor.

1.09 PROTECTION OF UTILITIES

- A. The Contractor shall contact and cooperate with utility companies to locate all utilities (including buried or submerged utilities, cables, and other structures) within all work areas prior to beginning the work. Contractor shall confirm location of utilities within all work areas prior to start of construction.
- B. The Contractor shall comply with the requirements of State of Oregon regulations for protection of underground utilities and overhead utilities.
- C. All utilities shall be protected from damage during construction. If damaged, the utilities shall be repaired as required by the utility owner or the Owner at the Contractor's expense.

1.10 PROTECTION OF FACILITIES

- A. The Contractor shall protect all existing site facilities and structures during operations at the site within the work limits with the exception of demolition activities included in the Contract and identified in the Contract Documents. Due care shall be exercised to avoid damage to existing facilities and structures including piers, docks, piles, structures, boats, railing, gangways, and other facilities located within harbor.
- B. If any facilities, structures, equipment, or materials are damaged by the Contractor's operations, the Contractor shall repair or replace them immediately to the satisfaction of the Owner.
- C. The Contractor shall have personnel available at all times to immediately wash off and clean as necessary any debris or material dropped or splashed on any boats, docks or fingers within the work limits, at no additional cost to the Owner.
- D. The Contractor shall not use any areas, facilities, equipment or materials belonging to the Owner without the Owner's permission unless specifically identified in the Contract Documents.

1.11 HEALTH AND SAFETY

- A. The Contractor's site-specific Health and Safety Plan shall be submitted as per the requirements of Section 01340 – Submittals.

- B. General site workers (such as equipment operators, spotters, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site (e.g., HAZWOPER training), and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIAL

- A. The contractor is responsible for identifying and procuring all equipment, materials, etc. necessary to complete the work described herein.

PART 3 EXECUTION

3.01 GENERAL

- A. Conduct all required activities in accordance with the requirements of the Contract Documents and as otherwise, directed by the Owner to complete the work under this Contract. Coordinate the work to limit adverse effects of the work on the activities of the Owner, and other owners and users of adjacent properties, and the public.
- B. The Contractor shall keep the Owner aware of the timing and duration of project activities. Any changes or delays from the information provided to the Owner shall be communicated as soon as it is known.
- C. The Contractor shall execute the Contract Work in accordance with the requirements of the Contractor's site-specific Health and Safety Plan and all applicable federal and state health and safety requirements. The Contractor is responsible for health and safety of its employees and subcontractors and shall identify the appropriate level of personnel protective equipment (PPE) required during construction work for its employees and subcontractors.

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 MOBILIZATION AND DEMOBILIZATION

A. Description

1. "Mobilization and Demobilization" shall consist of preparatory work, operations, and cleanup, including, but not limited to, those necessary for the movement of personnel, equipment and supplies to and from the project site; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site. This shall also include but is not limited to all costs for labor, equipment, and material needed for any Contractor's field office including utilities, preparation of staging areas, fencing of staging sites, all leasing costs for office and material staging areas including Contractor parking and security of all construction material even after partial payment of project materials until Final Acceptance of the Project.

B. Method of Measurement

1. "Mobilization and Demobilization" will not be measured for payment. The original contract bid amount for "Mobilization & Demobilization" shall not be adjusted, regardless of the fact that the Contractor may have, for any reason, shut down the Work on the project or moved equipment away from the project and then returned.
2. Partial payments will be made as follows:
 - a. When five-percent of the total original Contract amount is earned from other Contract items, excluding amounts paid for materials on hand, 50-percent of the amount Bid for Mobilization and Demobilization, or five-percent of the total original Contract amount, whichever is the least, will be paid.
 - b. When 10-percent of the total original Contract amount is earned from other Contract items, excluding amounts paid for materials on hand, 100-percent of the amount Bid for Mobilization and Demobilization, or 10-percent of the total original Contract amount, whichever is the least, will be paid.
 - c. When the Substantial completion date has been established for the project, payment of any amount Bid for Mobilization and Demobilization in excess of 10-percent of the total original Contract amount will be paid.

C. Basis of Payment

1. Payment for "Mobilization and Demobilization" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.

1.02 DEMOLITION

A. Description

1. "Demolition" shall include all labor, equipment and materials required, but not limited to, removal, stockpiling, transportation, and disposal of the items specified for removal in the Plans. This includes floating docks, piles, utilities, railing sections, etc. This work includes temporary support of utilities during construction to maintain water and electrical service on the dock sections not currently being demolished, during construction activities. Salvaging the items indicated in the construction drawings (i.e. 12.75" steel pipe piles for reinstallation) and specifications for reinstall and/or turning over to the City (i.e. Dock 2 Gangway) shall be included in this bid item.
2. Salvage items include:
 - a. Six (6) 12.75" diameter steel pipe piles shall be salvaged. These will be reinstalled as part of "Install Salvaged 12.75" Float Piles".
 - b. One (1) steel gangway from Dock 2 shall be salvaged. The salvaged gangway shall be loaded onto an Owner furnished trailer, on-site, for removal and possession by the Owner. Coordinate transfer with Owner's Representative.

B. Method of Measurement

1. Measurement for payment for "Demolition" shall be per a percent complete basis based on the approved schedule of values for Lump Sum Pay unit, in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Demolition" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.
2. Partial payment for Work will be based on the Contract Bid Schedule on percent complete basis.

1.03 FURNISH AND INSTALL FLOATING DOCKS

A. Description

1. "Furnish and Install Floating Docks" shall include all labor, equipment and materials required, but not limited to furnish and install the new floating docks in accordance with the construction plans and specifications, including, but not limited to, new float units, pile hoops, cleats, and other miscellaneous components that make up the completed floating dock system.

B. Method of Measurement

1. Measurement for payment for "Furnish and Install Floating Docks" shall be upon the completion of the entire Work as a Lump Sum Pay unit, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

- a. Payment for "Furnish and Install Floating Docks" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.
- b. Partial payment for Work will be based on the Contract Bid Schedule on percent complete basis.
- c. Partial payment will be made for approved materials on-site and not installed.
- d. Partial payment for approved material off-site and not installed will be considered on an individual case basis.

1.04 FURNISH AND INSTALL 16" FLOAT PILES

A. Description

1. "Furnish and Install 16" Float Piles" shall include all labor, equipment and materials required, but not limited to furnish and install new steel pipe piles, including drive shoes, bird caps, etc. for the new dock system.

B. Method of Measurement

1. Measurement for payment for "Furnish and Install 16" Float Piles" shall be based on the number of Each, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Furnish and Install 16" Float Piles" under the Base Bid shall be made at the Unit Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.

1.05 INSTALL SALVAGED 12.75" FLOAT PILES

A. Description

1. "Install Salvaged 12.75" Float Piles" shall include all labor, equipment and materials required to install the salvaged steel pipe piles for the new dock system. The extraction of the salvaged piles is covered in "Demolition."

B. Method of Measurement

1. Measurement for payment for "Install Salvaged 12.75" Float Piles" shall be based on the number of Each, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Install Salvaged 12.75" Float Piles" under the Base Bid shall be made at the Unit Price named in the Bid Schedule under the Pay Item, which payment shall constitute

full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.

1.06 FURNISH AND INSTALL BEARING PILES

A. Description

1. "Furnish and Install Bearing Piles" shall include all labor, equipment and materials required, but not limited to furnish and install new steel pipe bearing piles, including drive shoes, for the new ADA gangway support pier.

B. Method of Measurement

1. Measurement for payment for "Furnish and Install Bearing Piles" shall be based on the number of Each, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Furnish and Install Bearing Piles" under the Base Bid shall be made at the Unit Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.

1.07 FURNISH AND INSTALL PIER

A. Description

1. "Furnish and Install Pier" shall include all labor, equipment and materials required, but not limited to furnish and install the new ADA access gangway support pier in accordance with the construction plans and specifications, including, but not limited to, new steel frame pier, gangway hangers, steel pile caps, epoxy anchors, grating deck and steel guardrails. Excludes furnish and install of two new steel pipe bearing piles (see Pay Item "Furnish and Install Bearing Piles"), but does include pile to pile cap welds.

B. Method of Measurement

1. Measurement for payment for "Furnish and Install Pier" shall be upon the completion of the entire Work as a Lump Sum Pay unit, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Furnish and Install Pier" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.
2. Partial payment for Work will be based on the Contract Bid Schedule on percent complete basis.
3. Partial payment will be made for approved materials on-site and not installed.
4. Partial payment for approved material off-site and not installed will be considered on an

individual case basis.

1.08 FURNISH AND INSTALL ADA GANGWAY

A. Description

1. "Furnish and Install ADA Gangway" shall include all labor, equipment and materials required, but not limited to furnish and install the new aluminum ADA Gangway in accordance with the construction plans and specifications.

B. Method of Measurement

1. Measurement for payment for "Furnish and Install ADA Gangway" shall be upon the completion of the entire Work as a Lump Sum Pay unit, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Furnish and Install Gangways" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.

1.09 FURNISH AND INSTALL DOCK WATER SYSTEM

A. Description

1. "Furnish and Install Dock Water System" shall include all labor, equipment and materials required, but not limited to furnish and install the dock potable water system, and fire hose accessories in accordance with the construction plans and specifications.
2. Note, one fire extinguisher per fire hose cabinet (total of three) are included in this bid item. Additional fire extinguishers, life rings and ladders are included in bid item "Fire Extinguishers, Life Rings and Dock Safety Ladders."

B. Method of Measurement

1. Measurement for payment for "Furnish and Install Dock Water System" shall be upon the completion of the entire Work as a Lump Sum Pay unit, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Furnish and Install Dock Water System" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.
2. Partial payment for Work will be based on the Contract Bid Schedule on percent complete basis.
3. Partial payment will be made for approved materials on-site and not installed.
4. Partial payment for approved material off-site and not installed will be considered on an individual case basis.

1.10 FURNISH AND INSTALL DOCK ELECTRICAL AND LIGHTING SYSTEM

A. Description

1. "Furnish and Install Dock Electrical and Lighting System" shall include all labor, equipment and materials required, but not limited to furnish and install the electrical and lighting for the new docks and gangway in accordance with the construction plans and specifications.

B. Method of Measurement

1. Measurement for payment for "Furnish and Install Dock Electrical and Lighting System" shall be upon the completion of the entire Work as a Lump Sum Pay unit, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Furnish and Install Dock Electrical and Lighting System" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.
2. Partial payment for Work will be based on the Contract Bid Schedule on percent complete basis.
3. Partial payment will be made for approved materials on-site and not installed.
4. Partial payment for approved material off-site and not installed will be considered on an individual case basis.

1.11 FIRE EXTINGUISHERS, LIFE RINGS AND DOCK SAFETY LADDERS

A. Description

1. "Fire Extinguishers, Life Rings and Dock Safety Ladders" shall include all labor, equipment and materials required, but not limited to furnishing and installing the fire extinguishers (except the three extinguishers installed as part of "Furnish and Install Dock Water System"), life rings and ladders in accordance with the construction plans and specifications. This item includes providing the additional fire extinguishers, in cabinets, and life rings with line, in associated cabinets, and the dock safety ladders as shown in the Plans.

B. Method of Measurement

1. Measurement for payment for "Fire Extinguishers, Life Rings and Dock Safety Ladders" shall be upon the completion of the entire Work as a Lump Sum Pay unit, complete, all in accordance with the requirements of the Contract Documents.

C. Basis of Payment

1. Payment for "Fire Extinguishers, Life Rings and Dock Safety Ladders" under the Base Bid shall be made at the Lump Sum Price named in the Bid Schedule under the Pay Item, which payment shall constitute full compensation for all Work described in this pay item, as shown on the plans and as directed by the Engineer.
2. Partial payment for Work will be based on the Contract Bid Schedule on percent complete basis.
3. Partial payment will be made for approved materials on-site and not installed.

4. Partial payment for approved material off-site and not installed will be considered on an individual case basis.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01310
MEETINGS AND NOTIFICATION REQUIREMENTS

PART 1 GENERAL

1.01 PRECONSTRUCTION MEETING

- A. Following the award, the Owner will notify the selected Bidder of the time and date of a preconstruction meeting.
- B. The preconstruction meeting will be scheduled at the City offices or at a mutually agreed to alternate location.
- C. The Owner and Owner's representative(s) will attend the preconstruction meeting. The following representatives of the Contractor are required to attend the preconstruction meeting:
 - 1. Project Manager
 - 2. Contract Administrator
 - 3. Major Subcontractors (if any)
- D. Agenda for the preconstruction meeting will include:
 - 1. Pre-contract submittals and requirements;
 - 2. Execution of contract;
 - 3. Discussion of Contract work, Contract Drawings, Specifications, project schedule and quality control requirements; and
 - 4. Site visit.

1.02 PROGRESS MEETINGS

- A. Progress meetings will be held on a weekly basis or at a frequency based on the progress of certain construction activities.
- B. The Owner or Owner's Representative will arrange meetings, prepare a meeting agenda, and distribute the agenda with copies for participants. The Owner or Owner's Representative will preside at meetings, record minutes to include significant proceedings and decisions, and distribute copies to the Contractor, meeting participants, and others affected by decisions made.
- C. The Contractor's project manager and project superintendent or designee shall attend progress meetings.
- D. The Contractor shall submit an updated project schedule and weekly construction report as described in Section 01340 - Submittals to the Owner at the end of each work week or one day prior to the weekly progress meeting, whichever is sooner.
- E. Standard agenda for the progress meetings will include items listed below in addition to other necessary agenda item as deemed necessary by the owner relative to execution of the work.

1. Review of work progress.
2. Field observations, problems, and decisions.
3. Identification of problems that impede planned progress.
4. Maintenance of progress schedule.
5. Corrective measures to regain projected schedules.
6. Planned progress during succeeding work period.
7. Coordination of projected progress.
8. Maintenance of quality and work standards.
9. Effect of proposed changes on progress schedule and coordination.
10. Health and safety update.

1.03 SPECIAL MEETINGS

- A. Attend special meetings that may be held at Owner or Owner's Representative's request when a special issue, problem or deficiency is present or likely to occur. The purpose of these meetings shall be to define and discuss the issue, problem or recurring work deficiency, review alternative solutions, and identify a plan to efficiently and effectively resolve the problem or deficiency.
- B. The Contractor's attendance at off-site meetings with regulatory agencies or other parties will be arranged as necessary. The Contractor shall participate in offsite meetings at no additional cost to the Owner.

1.04 HEALTH AND SAFETY MEETINGS

- A. The Contractor shall conduct health and safety meetings for Contractor's personnel in accordance with the requirements of the Contractor's site-specific Health and Safety Plan (HASP) and all applicable federal and state health and safety requirements, including but not limited to daily tailgate safety meetings. The Owner and Owner's Representative may attend Contractor's health and safety meetings, as needed, to be aware of work conditions or health and safety concerns that could affect the normal business activities of the Owner.

1.05 NOTIFICATION REQUIREMENTS

- A. The Contractor shall notify the Owner at the following points in the project, prior to proceeding further, to allow inspection of the Contractor's work progress. The Owner may request additional notification points based on review of submittals/construction documentation provided by the Contractor.
 1. After installation of site access and traffic control.
 2. After installation of marine environmental control measures.
 3. After set up of temporary facilities and prior to commencement of demolition activities.
 4. Prior to any major repairs.
 5. Prior to dismantling of the traffic and marine environmental controls.

6. Prior to de-mobilization of equipment from the Site.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01330
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. All materials, equipment, and methods shall be submitted for the Owner's review. The information submitted shall consist of drawings, specifications, descriptive data, certificates and other information specified in the Contract Documents.

1.02 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials, equipment, and method of work shall be as described in the submittal.
- B. The Contractor shall verify that the materials, equipment and methods described in each submittal conform to the requirements of the Contract Drawings and Specifications. If the information shows deviations from the Contract Drawings and Specifications, the Contractor shall, by written statement accompanying the information, identify the deviations and state the reason therefore.
- C. The Contractor shall be responsible for the coordination of submittals by the subcontractors.
- D. Submittals shall be made in a timely manner to allow review by the Owner. Work performed by the Contractor without accepted submittals related to such work shall be considered as having been performed by the Contractor at their own risk. If related submittals are found not acceptable, the Contractor shall remove or correct work related to such unacceptable submittals, to the satisfaction of the Owner.

1.03 TRANSMITTAL PROCEDURE

- A. General
 - 1. Submittals shall be accompanied with the Owner's transmittal form prepared by the Contractor. A separate form shall be used for each item, class of material, piece of equipment specified in separate sections for which the submittal is required. Submittals for several items shall be made with a single form when the items together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.
 - 2. A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "XXX"; where "XXX" is the sequential number assigned by the Contractor. Resubmittals shall have the following format: "XXX^Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. "Submittal 025B", for example, is the second resubmittal of "Submittal 025".

- B. Deviation from the Contract: If the Contractor proposes to provide material or equipment which does not conform to the Contract Drawings and Specifications, they shall indicate so under “deviations” on the transmittal form accompanying the submittal. The Contractor shall explain the reason for the change, shall include cost differential, and shall request a change order to cover the deviations.
- C. Submittal completeness: Submittals which do not have adequate information are not acceptable and will be returned without review.

1.04 SUBMITTAL FORWARDING PROCEDURE

- A. Submittals shall be submitted electronically in Adobe Portable Document Format (.pdf) or MS Word format (.doc or .docx). If submitted physically, submit the number of copies which the Contractor requires plus three copies, which will be retained by the Owner.
- B. Drawings: standard submittal sizes shall be 8-1/2 by 11 inches, 11 by 17 inches, and 22 by 34 inches.
- C. Samples: submit the number or quantity stated in the specification section.
- D. Certifications: certificates will be acknowledged. No copy will be returned.

1.05 REVIEW PROCEDURE

- A. Within fifteen (15) calendar days after receipt of the submittal, the Owner will review the submittal and return the marked-up reproducible original, unless otherwise specified.
- B. The returned submittal will indicate one of the following actions:
 - 1. If the review indicates that the material, equipment, or work method is in general conformance with the design concept and complies with the Contract Drawings and Specifications, the submittal copies will be marked “NO EXCEPTIONS TAKEN.” In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal, provided that the specified corrections are made to the submittal.
 - 2. If the review indicates that the submittal is insufficient or that limited corrections are required, the submittal copies will be marked “FURNISH AS CORRECTED.” The Contractor may begin implementing the work method or incorporating the material or equipment covered by the submittal, in accordance with the noted corrections. Where submittal information will be incorporated in operation and maintenance data, a corrected copy shall be provided within fifteen (15) days, otherwise no further action will be required.
 - 3. If the review reveals that the submittal is insufficient or contains incorrect data, the submittal copies will be marked “REVISE AND RESUBMIT.” Except at their own risk, the Contractor shall not undertake work covered by this submittal until the attached comments have been either confirmed by a separate written communication or the submittal has been revised, resubmitted, and returned marked either “NO EXCEPTIONS TAKEN” or “FURNISH AS CORRECTED.”
 - 4. Submittals may be marked “REJECTED” for not complying with requirements.

5. Certain submittals such as Contractor's Health and Safety Plan will not be reviewed by the Owner. These submittals will be marked "ACKNOWLEDGED AS RECEIVED".
6. Submittals not required by the Contract Documents will not be recognized or processed.

1.06 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

- A. Review of drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide shall not relieve the Contractor of their responsibility for errors therein and for failure to comply with the Contract Drawings and Specifications and shall not be regarded as an assumption of risks or liability by the Owner, or by any representative of the Owner. The Contractor shall have no claim under the Contract because of the failure, or partial failure, of the method of work, material, or equipment so reviewed. A mark of "NO EXCEPTIONS TAKEN" or "FURNISH AS CORRECTED" shall mean that the Owner has no objection to the Contractor using the plan or method of work proposed, or providing the materials or equipment proposed.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01340
SUBMITTALS

PART 1 GENERAL

1.01 SUMMARY

- A. All materials, equipment, and methods shall be submitted for approval in accordance with the procedures specified in Section 01330 – Submittal Procedures. The information submitted shall consist of drawings, specifications, descriptive data, certificates, samples, test results, and other information specified herein and elsewhere in the Contract Documents.
- B. The Contractor shall provide submittals for all materials to be incorporated in the work as well as shop drawings for all fabricated materials for approval by the Owner. Certifications, manufacturer's data and other information for all materials shall be submitted and written approval obtained prior to fabrication or installation. All materials shall conform to the Contract Documents, Contract Specifications, Contract Drawings, good workmanship, generally accepted industry standards, and manufacturer's written instructions.

1.02 REFERENCES

- A. 29 CFR 1910, Occupational Safety and Health Regulations (OSHA).

1.03 PRE-CONSTRUCTION SUBMITTALS

- A. Health and Safety:
 - 1. The Contractor shall assess the potential safety risks to on-site personnel and develop a site-specific Health and Safety Plan (HASP) to safely execute the work under this Contract. The Contractor is responsible for independently evaluating the physical and chemical hazards associated, or potentially associated with the project site and the work under this Contract, and developing a site-specific HASP that adequately addresses these hazards in compliance with applicable local, state, and federal regulations. The Contractor shall prepare a site-specific HASP prior to commencing the Contract Work and submit it to the Owner for general acknowledgment. A copy of the acknowledged site-specific HASP will be maintained on site at all times. The Owner will only acknowledge receipt of submittal of the Contractor site-specific HASP. The Owner will not provide comment on the Contractor's site-specific HASP.
 - 2. Submit the names and qualifications of Contractor's health and safety officer for the work.
 - 3. Submit proof of appropriate OSHA training for site workers and supervisory personnel who are authorized by the Contractor to engage in work associated with contaminated/hazardous materials and potentially hazardous materials. In addition, for the onsite supervisory personnel, submit current certification of onsite management or supervisor training, and American Red Cross first aid and cardiopulmonary resuscitation (CPR) training.
- B. Project Schedule:

1. The Contractor shall submit a preliminary project schedule no later than five (5) calendar days after the date the Contract is executed. The project schedule shall take into account potentially variable production rates that may be required to access the various areas of the Site. The project schedule shall display the following information, at a minimum:
 - a. Construction start date
 - b. Critical path
 - c. Identification and sequencing of contract work by work area.
 - d. Listing of each Contract Bid Item
 - (1) Activity description
 - (2) Activity duration
 - (3) Predecessor activities
 - (4) Successor activities
 - e. Physical Completion Date
- C. Describe Contractor's quality control and project management organization structure. Briefly describe general role and provide contact information of each individual listed on the quality control and project management organization.
- D. List of Subcontractors with contact information of key personnel and list of all work items to be subcontracted.
- E. Demolition and Disposal Plan
 1. The Demolition and Disposal Plan shall outline the Contractor's approach to accomplishing demolition tasks and identify the following, at a minimum:
 - a. Sequence and method for removal of the different infrastructure items identified for demolition.
 - b. Measures to be taken and equipment to be employed to ensure worker safety and full compliance with applicable regulations.
 - c. Measures to be taken to avoid demolition debris entering the water and measures to remove debris that does enter the water.
 - d. Measures to be taken to ensure materials are legally disposed of including:
 - (1) Specific disposal site(s) for each type of removed material and debris.
 - (2) The manner by which receipt at the disposal site will be documented.
- F. Spill Prevention Control and Countermeasures (SPCC) Plan
 1. The Contractor's SPCC Plans shall be completed in accordance with applicable permit requirements. The Contractor's SPCC Plans shall also include coordination with USCG Station Depoe Bay. The SPCC plan will:

- a. Identify construction planning elements and recognize potential spill sources during Site construction, and handling, offload and transport of demolition material.
- b. Method of refueling floating equipment, boats etc. and spill prevention containment and clean-up.
- c. Outline the response actions in the event of a spill or release and identify notification and reporting procedures.
- d. Outline what measures shall be taken by the contractor to prevent the release or spread of hazardous materials that are encountered on-site during construction, or any hazardous materials that the Contractor stores, uses, or generate on the construction site during construction activities.

1.04 DURING-CONSTRUCTION SUBMITTALS

A. Daily Construction Report:

1. The Contractor's daily construction report shall contain a summary description of all work performed during that day, names of Contractor personnel, equipment on site and hours worked.

B. Weekly Construction Report:

1. The Contractor's weekly construction report shall identify quantities of work accomplished for each pay item identified in the Bid Form, and shall be accompanied with an updated project schedule with a seven day look ahead for anticipated project activities. The weekly construction report and updated project schedule shall be submitted to the Owner at the end of each work week or one day prior to the weekly progress meeting, whichever is sooner. At a minimum, schedule updates shall reflect the following information:
 - a. The actual duration and sequence of as-constructed work activities, including changed work.
 - b. Approved time extensions.
 - c. Unresolved requests for time extensions shall be reflected in the updated project schedule by assuming no time extension will be granted, and by showing the effects to follow-on activities necessary to physically complete the project within the currently authorized time for completion.
 - d. Any construction delays or other conditions that affect the progress of the work.
 - e. Any modifications to the as-planned sequence or duration of remaining activities.
 - f. Any modifications to the critical path.
 - g. The physical completion of all remaining work in the remaining Contract time.
 - h. A detailed three-week projection of anticipated activities.

1.05 CLOSEOUT SUBMITTALS

- A. The Contractor shall prepare and submit electronic CAD and PDF files of the project as-builts accepted by the Owner.
- B. Project Record Documents
- C. Project record documents shall be provided by the Contractor as described in the Contract Documents.
- D. Consolidated Job Report: Upon completion of the job, the Contractor shall submit a consolidated job report combining all daily and weekly construction reports.
- E. Submit one copy of Contract Drawings and Specification marked as follows:
 - 1. Each sheet of Contract Drawings and Specifications with "CONTRACT RECORD DOCUMENT".
 - 2. Describe conditions which deviate from Contract issue of these documents. Use red indelible pens for record-marking. Indicate changes made by Field Orders or Change Orders.

PART 2 PART 2 – PRODUCTS

Not Used.

PART 3 PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01400
CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

- A. This section describes the Contractor's general quality control requirements, duties, and responsibilities during execution of the Contract Work. Specific quality control requirements are presented in individual specification sections. Contractor quality control is the means by which the Contractor furnishes the resources necessary to control the work and provide documentation to confirm that completed work complies with the requirements of the Contract Documents.
- B. The Contractor shall implement effective quality control program to assure that all materials and completed construction conform to requirements of the Contract Documents and manufacturer's recommendations. Although the guidelines are established and certain minimum requirements are specified herein and elsewhere in the Contract Documents, the Contractor shall assume full responsibility for accomplishing the stated purpose.
- C. The Contractor shall be prepared to discuss, at the preconstruction meeting, any understanding of the quality control requirements. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the required submittals per Specification Section 01340 - Submittals has been reviewed by the Owner.

1.02 CONFLICTING REQUIREMENTS

- A. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement unless otherwise directed by the Owner. Refer conflicting requirements that are different, but apparently equal, to the Owner for a decision before proceeding.

1.03 SUBMITTALS

- A. Refer to Specification Section 01340 - Submittals.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 CONTRACTOR QUALITY CONTROL

- A. The Contractor shall perform inspection and testing of all items of work required by the Contract Documents, including those performed by subcontractors. The Contractor shall ensure conformance to applicable Specifications and Contract Drawings with respect to materials, workmanship, construction, finish, and functional performance.
- B. The Contractor shall maintain current quality control records of all inspections or tests performed. These records shall include factual evidence that the required inspections or tests

have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed corrective action; and corrective actions taken.

- C. The Owner may notify the Contractor of any non-compliance with project quality control requirements. The Contractor shall, after receipt of such notice, immediately take corrective action.
- D. In cases where quality control activities do not comply with the Contract provisions, or where the Contractor fails to properly operate and maintain an effective quality control as determined by the Owner, the Owner may:
 - 1. Direct the Contractor to replace ineffective or unqualified quality control personnel or subcontractors.
 - 2. Carry out the functions and operations to achieve project quality control requirements. Costs incurred by the Owner to operate the required quality control or to otherwise remedy the Contractor's non-compliance with quality-related provisions of the Contract shall be deducted from the total amount due the Contractor.
 - 3. Order the Contractor to stop operations until appropriate corrective actions are taken.
- E. Any failure by the Owner to notify the Contractor of any non-compliance with any of the foregoing requirements shall not be deemed as a waiver of its enforcement rights hereunder and that the Contractor is still bound by the terms and conditions of said requirement.

END OF SECTION

SECTION 01520
TEMPORARY CONSTRUCTION FACILITIES

PART 1 GENERAL

1.01 SUMMARY

- A. This section describes the requirements to provide the temporary on-site construction facilities required by the Contractor until the final completion of the Contract Work.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIAL

- A. The contractor is responsible for identifying and procuring all equipment, materials, etc. necessary to complete the work described herein.

PART 3 EXECUTION

3.01 FIELD OFFICE

- A. The Contractor may elect at their discretion to install and maintain necessary field office space during the Work and remove at completion of the Contract Work. The field office, if elected shall be installed in a location satisfactory of the Owner.

3.02 SANITARY FACILITIES

- A. The Contractor shall provide and maintain sanitary facilities as required by state and federal requirements for construction sites.

END OF SECTION

SECTION 01550
SITE ACCESS CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. Contractor Staging Area(s) are identified in the Plans.
- B. This section describes the requirements to provide site access, and vessel and vehicular traffic control during the duration of the Work.
- C. The Owner shall be responsible for clearing moored vessels from within the work area.
- D. Site access and traffic controls shall be in place to the Owner's satisfaction prior to commencement of construction activities. The Contractor shall assist in traffic control and coordination as described herein during the entire period of activities under this contract.

1.02 REFERENCES

None

1.03 SUBMITTALS

- A. Refer to Section 01340 – Submittals.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIAL

- A. The contractor is responsible for identifying and procuring all equipment, materials, etc. necessary to complete the work described herein.
- B. Temporary construction fencing procured and installed by the Contractor shall conform to standards of care.

PART 3 EXECUTION

3.01 SITE ACCESS CONTROLS

- A. The Contractor shall be responsible for ensuring that no unauthorized personnel enter the worksite. Authorized persons shall be limited to those employed by the Contractor specifically for this work, and designated Owner's representative(s).
- B. The Contractor shall erect and maintain temporary controls on the float structures within the work area to prevent unauthorized pedestrian access. Controlled pedestrian access must be allowed at all times to the floats outside of the work area. On identification of pedestrians requiring access to the floats outside the work area, the contractor shall temporarily stop operations to allow for safe passage of pedestrians through the work area. Disruptions resulting from pedestrian access shall not result in changed conditions or provide basis for delay claims.

- C. The Contractor shall erect temporary construction fencing around all the upland construction areas and implement appropriate access controls in the marine areas to protect and restrict access to the site.
 - D. The temporary fencing shall be erected and maintained such that it will remain intact and effective in the Contractor's absence during weather which can reasonably be expected during the period of the project.
 - E. The Contractor shall confirm with the Owner the adequacy of the area to be cleared of moored vessels prior to beginning the Work. Additional clearing will be completed by the Owner at the request of the contractor. Any delay resulting from additional vessel relocation shall not result in changed condition or provide basis for any delay claims.
 - F. The Contractor shall provide the Owner's representative with a means of contacting a Contractor's representative during off hours.
- 3.02 CONSTRUCTION TRAFFIC
- A. The Contractor shall minimize vehicular traffic into and out of the upland portion of the site.
 - B. The Contractor's employee shall oversee any vehicle's entrance to or exit from the site, and direct the construction vehicle and any non-construction traffic as-needed to prevent accidents and ensure smooth traffic around the site.
 - C. During the construction, the Contractor shall pre-plan and coordinate with the Owner to avoid/minimize interference with traffic on the streets adjacent to the site, and traffic accessing nearby operating business.
- 3.03 VESSEL NAVIGATION
- A. The Contractor shall maintain safe vessel navigation and passage during all construction activities.
 - B. The Contractor shall adhere to all United States Coast Guard and local requirements regarding vessel navigation and passage while construction activities are being performed.
 - C. The Contractor shall be responsible for establishing acceptable equipment staging locations and maintaining safe vessel navigation and passage at the site including but not limited to access to piers and docks; and general navigation within the harbor during construction.
 - D. The Contractor shall be responsible for minimizing disruption to harbor operations during construction.
 - E. The Contractor shall be responsible for installation of all temporary navigation aids and marker buoys necessary for vessel navigation.

END OF SECTION

SECTION 01570
MARINE ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. This work item shall consist of planning, installing, inspecting, maintaining, and removing marine environmental control measures. The Work includes compliance with all controls or ordinances with respect to equipment decontamination, site maintenance, air pollution control, dust, water quality, noise, oil spills, and contaminated/hazardous materials.
- B. Any fines resulting from the Contractor's inability to comply with project permit conditions shall be the responsibility of the Contractor. Payment of fines, if applicable, shall be deducted from the amount due or to become due to the Contractor.

1.02 REFERENCES

- A. Water Quality Standards for Surface Waters of the State.

1.03 PERMITS APPLICABLE TO MARINE WATER QUALITY

- A. The Contractor shall be responsible to adhere and conform to all applicable provisions, conditions and requirements of the project permits. Permits and authorizations are provided in the Reference Section of the Contract Documents and are listed in Section 01010 – Description of Work.

1.04 SUBMITTALS

- A. Refer to Section 01340 – Submittals.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIAL

- A. The contractor is responsible for identifying and procuring all equipment, materials, etc. necessary to complete the work described herein.

PART 3 EXECUTION

3.01 MARINE ENVIRONMENTAL CONTROL

- A. Work in or near water of the State shall be completed so as to minimize turbidity, erosion, and other water quality impacts. A marine silt curtain, containment boom or similar shall be installed around the perimeter of the work at all times while performing in-water construction activities. Work equipment includes all work vessels, barges, excavators and other equipment.
- B. As applicable, the Contractor shall identify and employ means and materials necessary to prevent runoff from the upland construction and/or construction staging areas from entering the water.

- C. Project activities shall not degrade water quality to the detriment of fish life. If at any time, as a result of project activities, fish are observed to be in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills), the Contractor shall immediately notify the Owner.

3.02 SITE MAINTENANCE

- A. The Contractor shall keep the work site, staging areas, and Contractor's facilities clean and free from excess dirt, rubbish, and debris at all times. Materials and equipment shall be removed from the Site when they are no longer necessary. Upon completion of the Contract Work and before final acceptance, the work site shall be cleared of equipment, unused materials, and dirt and rubbish to present a clean and neat appearance in conformance with the present condition of the site.
- B. Waste material of any kind shall not be permitted to accumulate, remain at the site of the Work, nor on the adjacent street areas.
- C. In the event that waste material, refuse, debris or rubbish is not so removed from the work area or on adjacent streets by the Contractor, the Owner reserves the right to have such material removed and the expense of the removal and disposal charged to the Contractor.

3.03 AIR POLLUTION CONTROL

- A. The Contractor shall not discharge smoke, dust, or other contaminants into the air that violate the regulations of any legally constituted authority. Internal combustion engines shall not be allowed to idle for prolonged periods of time. The Contractor shall maintain construction vehicles and equipment in good repair. Exhaust emissions that are determined to be excessive by the Owner shall be repaired or the equipment replaced at the Contractor expense.
- B. The Contractor shall minimize fugitive dust by cleaning, sweeping, vacuum sweeping, sprinkling with water, or other means. The use of water, in amounts that result in mud on public streets or runoff to the marina or on-site or off-site drain catchments is not acceptable as substitute for sweeping or other methods.

3.04 NOISE CONTROL

- A. Construction involving noisy operations, including starting and warming up of equipment shall be in compliance with local noise ordinances.
- B. Construction activities will be performed during day-light hours, unless otherwise approved by the Owner.
- C. The Contractor shall comply with all local controls and noise level rules, regulations and ordinances which apply and any work performed pursuant to the Contract.
- D. Each internal combustion engine, used for any purpose on the job or related to the job, shall be enclosed and be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler and enclosure.

- E. Workers shall not be exposed to noise levels from construction vehicles including backhoe, excavator, grader and trucks; that exceed 90 dBA as measured under the noisiest operating conditions. For all other equipment, workers shall not be exposed to noise levels exceeding 85 dBA. Equipment that cannot meet these levels, shall be quieted by use of improved exhaust mufflers, portable acoustical screens, or other means. Equipment not modified to meet these requirements shall be removed from the project.

3.05 OIL SPILL PREVENTION AND CONTROL

- A. The Contractor shall be responsible for prevention, containment, and cleanup of spilling of oil, fuel and other petroleum products used in the Contractor's operations. All such prevention, containment and cleanup costs shall be borne by the Contractor.
- B. The Contractor shall also coordinate SPCC Plans with USCG Station Depoe Bay.
- C. The Contractor is advised that discharge of oil from equipment or facilities into state waters or onto adjacent land is not permitted under state and federal water quality regulations.
- D. The Contractor shall, at a minimum, take the following measures regarding oil spill prevention, containment and cleanup:
 - 1. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities shall be inspected regularly for drips, leaks, or signs of damage, and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.
 - 2. All land-based oil and products storage tanks shall be diked or located so as to prevent spills from escaping to the water. Diking and subsoils shall be lined with impervious material to prevent oil from seeping through the ground and dikes.
 - 3. All visible floating oils shall be immediately contained with booms or other appropriate means and removed from the water prior to discharge into state waters. All visible oils on land shall be immediately contained using dikes, straw bales, or other appropriate means and removed using sand, ground clay, sawdust, or other absorbent material, which shall be properly disposed of by the Contractor. Waste materials shall be temporarily stored in drums or other leak-proof containers after cleanup and during transport to disposal. Waste materials shall be disposed of properly at an approved site.
 - 4. Corrective actions shall be taken in the event of any discharge of material (including sediment, oil, fuel or chemicals), including:
 - a. In the event of a spill, containment and cleanup efforts will begin immediately and be completed as soon as possible, taking precedence over normal work. Cleanup will include proper disposal of any spilled material and used cleanup material.
 - b. The cause of the spill shall be assessed and appropriate action shall be taken to prevent future incidents or environmental damages.

- c. The Contractor shall prepare a memo describing the incident and providing specifics on the material released, possible causes and actions taken.

5. In the event of any oil or product discharges into public waters, or onto land with a potential for entry into public waters, the Contractor shall immediately notify Ecology's 24-Hour Spill Response Team at 1-800-258-5990. In addition, within 24 hours of spills notify Ecology's 401/CZM Federal permit coordinator at 1-360-407-6165.

6. The Contractor shall prepare a detailed written report within five (5) days that describe the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.
7. In the event of finding distressed or dying fish, the Contractor shall notify the Owner and collect fish specimens and water samples in the affected area within the first four hours of the event. These samples shall be held in refrigeration or on ice until the Contractor is instructed by the Owner on what to do with them. The Owner (under Ecology's direction and as per the requirements of permits) may require analyses of the samples before allowing the work to resume.

3.06 CONTAMINATED/HAZARDOUS MATERIALS

A. Contractor's Responsibility:

1. The Contractor shall be responsible for all matters related to work safety and for detection of contaminated materials encountered during the construction as they relate to worker safety. The Contractor shall ensure the protection of the safety and health of construction workers and other authorized persons at the work site from exposure to potential toxic materials.
2. As part of the Contractor's safety program, workers shall be instructed by a specialist on basic methods or techniques to assist workers in detecting and operating in the presence of contaminated/hazardous material during construction of this project.

B. Notification and Suspension:

1. In the event the Contractor detects the presence of suspicious materials, the Contractor shall immediately notify the Owner. Following such notification by the Contractor, the Owner will evaluate the suspicious material, collect samples to characterize the suspicious material (if needed) and notify the various governmental and regulatory agencies concerned with the presence of potentially contaminated/hazardous materials. Depending upon the type of problem identified, the Owner may suspend the work in the vicinity of the material discovery.
2. Following completion of any further testing necessary to determine the nature of the materials involved, the Owner will determine how the material shall be handled and disposed of. Although the actual procedures used in resuming the work shall depend upon the nature and extent of the questionable material, the following alternate methods of operation are foreseen as possible:

- a. The Contractor to resume work as before the suspension.

- b. The Contractor to move its operations to another portion of the work until measures to eliminate any hazardous conditions can be developed and approved by the appropriate regulatory agencies.
 - c. The Owner to direct the Contractor to dispose of the suspicious material at an approved legal landfill site.
 - d. The Owner to terminate the Contract.
- 3. If the Owner or Owner's Representative notices the presence of suspicious materials, then presence of such material will be notified to the Contractor and the Contractor shall comply with procedures described above.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

This Section includes a description of procedures to be followed and related work required to accomplish an orderly transfer of Project deliverables from the Contractor to the Owner.

1.02 DEFINITIONS

- A. Punch List: The stated qualification accompanying either the Engineer's Certificate of Substantial Completion or the Certificate of Final Payment, or any list of construction items found to be deficient or incomplete through review of the Work by Engineer and communicated in writing to Contractor at any time during the Contract Period.
- B. Substantial Completion: When the work is ready for its intended use.
- C. Record Drawings: Drawings showing changes made during actual construction.

1.03 SUBMITTALS

A. SUBSTANTIAL COMPLETION

- 1. Contractor to notify Engineer in writing that the Contractor considers the Work as a whole to be in Substantial Completion and request for a Substantial Completion inspection.
- 2. Record Drawings submitted to Engineer with accurate representation of all changes, as approved.

B. FINAL COMPLETION

- 1. Contractor to notify Engineer in writing that the Contractor considers the Work to have progressed to final completion.
- 2. Certification that all subcontractors and suppliers have been paid.
- 3. Submit to Engineer, letter(s) from Contractor's bonding agent(s) authorizing Owner to make final payment to the Contractor identifying the bonding agent's full approval for such actions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBSTANTIAL COMPLETION, ADJUSTMENT AND RELEASE OF RETAINAGE

- A. When the Work is found to be in a state of Substantial Completion with stated qualifications:
 - 1. Engineer will determine the value of the punch list work using either Project approved schedule of values or other method at its discretion.
 - 2. The value of incomplete work will be multiplied by two (2) and retainage reduced to that amount.

- B. No partial payments of the Substantial Completion retainage will be allowed.
- C. The Substantial Completion retainage will be released with final payment.

3.02 INSPECTION FOR FINAL ACCEPTANCE AND PAYMENT

- A. When the Work on the Punch List(s) have been completed, and Contractor considers the Work of the entire Project is complete, he shall submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with Contract Documents.
 - 3. Work has been completed in accordance with Contract Documents.
 - 4. Work is completed and ready for final inspection.
 - 5. Certification that all subcontractor and suppliers have been paid.
- B. Engineer will make an inspection with the Contractor to verify the status of completion within 5 calendar days after receipt of such certification.
- C. Should Engineer consider that the Work is incomplete or defective the following actions will occur:
 - 1. Engineer: Notify the Contractor in writing within 5 calendar days, listing the incomplete or defective work.
 - 2. Contractor: Remedy the stated deficiencies, and send a second written certification to Engineer that the Work is complete.
 - 3. Engineer will reinspect the Work.
- D. When Engineer finds the Work acceptable in accordance with the Contract Documents: Engineer requests Contractor to make closeout submittals.

3.03 FINAL APPLICATION FOR PAYMENT

- A. Complete demobilization prior to submitting final application for payment.
- B. Submit final application for payment in accordance with procedures and requirements stated in the Conditions of the Contract.
- C. Submit Certificate of Compliance Form 1700-A.
- D. Engineer will review application and if approved recommend final payment within 5 calendar days of receipt of application.

01700-A
CERTIFICATE OF COMPLIANCE FORM

Depoe Bay Harbor Docks 2-4 Replacement

TO: City of Depoe Bay

CONTRACT FOR (Revised Total): _____

CONTRACT DATE: _____

I (We) hereby certify that all work has been performed and materials supplied in accordance with the Plans, Specifications, and Contract Documents for the above work, and that:

- A. No less than prevailing rates of wages as ascertained by the governing body of the contracting agency have been paid to laborers, workmen, and mechanics employed on this work.
- B. There have been neither unauthorized substitutions of subcontractors nor have any subcontracts been entered into without the name of the subcontractors having been submitted to the Engineer prior to the start of such subcontractor work.
- C. No subcontract was assigned or transferred or performed by any subcontractor other than the original subcontractor, without prior notice having been submitted to the Engineer together with the names of all subcontractors.
- D. All claims for material and labor and other services performed in connection with these Specifications have been paid. No further claims will be made and all liens have been satisfied and lifted.
- E. All monies due the State Industrial Accident Funds, the State Unemployment Compensation Trust Fund, the State Tax Commission, hospital associations, and/or others have been paid.

CERTIFIED BY:

CONTRACTOR

DATE

END OF SECTION

SECTION 01730
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

A. DESCRIPTION OF WORK

1. Throughout progress of the Work of this Contract, the Contractor shall maintain an accurate record of all Project Record Documents/ As-Built Drawings (Redlines)
2. Provide one copy of the As-Built Drawings (Redlines) including design-build drawings to the Owner as specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01330 – Submittal Procedures
- B. Section 01340 – Submittals

1.03 SUBMITTALS

- A. General: Preparation of As-Built Drawings (Redlines) is a requirement of the Contract. The terms drawings, Contract Drawings, drawing files and as-built drawings refer to Contract As-Bid, (including Addenda) drawings that the Contractor is required to revise to produce an as-built record of the project.
- B. As-Built Drawings:
1. General
 - a. The Contractor shall revise (one set) of Contract drawings by redline process to show the as-built conditions during the course of the project. These working, as-built drawings shall be kept accurate and current.
 2. Final Redline Drawings Submittal
 - a. After approval of the current “Redline” documents by the Owner, and within 14 days after Substantial Completion of all or a part of the work, and prior to Final Payment request, submit (one copy) of the final As-Built Drawings (Redlines) to the Owner.

1.04 QUALITY ASSURANCE

- A. General:
1. The responsibility for maintenance of changes to the Project Record Documents shall be assigned to one person on the Contractor’s staff.
- B. Accuracy of Records:
1. As-Built (Redline) Drawings. Thoroughly coordinate all changes to the Contract Drawings by making red-line entries on an ongoing basis on a single set of As-bid drawings maintained at the job site. Accuracy shall be such that future uses of information showing the as-built condition of the Contract Work may reasonably rely on the information shown. The Owner’s

approval of the accuracy and current status of the record of changes to the As-Built Drawings (Redlines) will be a prerequisite to the Owner's approval of requests for each progress payment. Appropriate payment may be withheld if Redlines are not up to date at the times of periodic applications for progress payments.

1.05 PRODUCT HANDLING: AS-BUILT DRAWINGS

- A. During execution of the Work, the Contractor shall use all means necessary to maintain a record of changes to the Contract drawings completely protected from deterioration and from loss and damage. Such changes shall be recorded upon the Redlines which will be composed of Contractor markups on project drawing prints supplied by the Owner.

PART 2 PRODUCTS

2.01 PROJECT DRAWINGS

- A. Following award of the Contract, secure from the Owner one 11x17 size set of paper prints of the Contract drawings for recording As-Built conditions.

PART 3 EXECUTION

3.01 MAINTENANCE OF REDLINE DRAWINGS

- A. Identification
 - 1. Upon receipt of the project drawings described in paragraph 2.1 above, identify each of the Documents with the title REDLINES.
- B. Preservation
 - 1. In Consideration of the Contract completion time, frequent use of the Redlines for making new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the project Redlines to the approval of the Owner.
- C. Do not use the Redlines for any purpose except entry of new data and for review by the Engineer.
- D. Maintain the Redlines at the site of Work as designated by the Owner.
- E. Making Entries to the Redlines:
 - 1. Using an erasable red-colored pencil (not ink or indelible pencil), clearly describe the change by notes and by graphic line. It is not necessary for the Contractor to redraw what is clearly shown and dimensioned on a sketch accompanying the Change Directive, however the sketch should be included on the sheet or attached to the back of the preceding sheet.
 - 2. Make clear what information a sketch replaces, by "cloud" or similar device.
 - 3. Distinguish to the satisfaction of the Owner between annotations intended to be copied exactly by a future drafter creating Record Drawing files, and information that is supplemental and not meant to be copied. Examples of supplemental information would include notes to the drafter and information purely for the Contractor's information in

monitoring the change. A suggested approach is to make all markings not to be copied by the future drafter in a color other than red, reserving red for information to be copied exactly.

4. The working and final As-Built Drawings (Redlines) shall show, as a minimum, the following information:
 - a. All changes in the work generated by documents such as Change Orders, Requests for Information (RFIs) and Contractor-originated proposals. Identify the documents generating changes from the As-bid documents. These changes shall show the actual work with the same level of accuracy and completeness as the original Contract documents.
 - b. Any sketches that accompanied the Change directive attached to the drawing sheet or the back of the sheet preceding it.
 - c. The actual location, identification and sizes of material, equipment, utilities and elements of the project to the same level of detail as the original Contract (As-bid) drawings.
 - d. The correct scale, grade, elevations, dimensions and coordinates of changes.
 - e. Changes or modifications that result from final inspection.

END OF SECTION

SECTION 02220
DEMOLITION

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Work includes demolition and removal of all structures specified on the Plans, including certain specified floating docks, steel piles, concrete curb and rail sections, gangways, electrical components, plumbing components, and other miscellaneous marina related items designated for removal.
- B. Staging of construction work, including phasing of demolition and provisions for temporary access and continuous utility service, are part of this project. Detailed demolition and construction phasing plan shall be submitted by the Contractor for review and approval by the Owner prior to any demolition work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01520 – Temporary Construction Facilities
- B. Section 01550 – Site Access Controls
- C. Section 01570 – Marine Environmental Controls

1.03 REFERENCES

- A. American National Standards Institute ANSI A10.6 - "Safety Requirements for Demolition Operations"

1.04 SUBMITTALS

- A. Contractor shall submit detailed construction phasing plan for review by Owner prior to any demolition work.
- B. Phasing plan shall include detailed descriptions and sketches exhibiting Contractor's proposed method of maintaining access to the floats throughout demolition and construction.
- C. Plan shall also provide detailed descriptions and sketches exhibiting Contractor's proposed plan for maintaining temporary electrical and water service to the vessel moorage slips throughout demolition and construction.

1.05 QUALITY ASSURANCE

- A. Comply with all applicable rules, codes, regulations and safety orders of all public agencies having jurisdiction.
- B. Comply with the BMPs specified in the HPA issued for this project

1.06 SITE CONDITIONS

- A. The project is located within an active, public operating marina and the contractor shall conduct the work in a manner which is coordinated with the activities of the Owner, Owner's tenants, and facility users.
- B. The project involves demolition of chemically treated timber.
- C. If any additional demolition material is suspected to contain hazardous substances, the contractor shall submit information to the Owner for resolution prior to proceeding.
- D. If existing unidentified utilities, structures or services are discovered that affect the work in any way, submit information to the Owner for resolution prior to proceeding.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIAL

- A. The contractor is responsible for identifying and procuring all materials, products, equipment, etc. necessary to complete all of the work described herein.

PART 3 EXECUTION

3.01 SCHEDULE

- A. The contractor shall keep the Owner aware of the timing and duration of project activities. Any changes or delays from the information provided to the Owner shall be communicated as soon as it is known.

3.02 PREPARATION

- A. Pre-plan and coordinate demolition work to ensure minimal interruptions or disruptions to Owner's, tenants', or facility users' ongoing activities.
- B. Erect traffic controls and limit access to the site per Section 01520 - Temporary Construction Facilities and Section 01550 – Site Access Controls, prior to commencement of any of the work.
- C. Secure necessary information and permits required, and make detailed arrangements for smooth, safe execution of the work. The Owner will obtain the permits identified in Section 01010 – Description of Work; the Contractor is responsible for obtaining all other required permits.
- D. Allowable hours of work are Monday through Friday; 7:00 am – 5:00 pm. Extended work hours may be accommodated on a case-by-case basis subject to the approval of the Owner and review by the City of Depoe Bay.

3.03 SALVAGED MATERIALS

- A. Materials shall be salvaged and reused as shown and specified on the Plans. Items for salvage will include, not exclusively, the following:
 - 1. Construction materials which require temporary removal for construction access, and
 - 2. Steel pipe piles specified for reuse

3. Dock 2 gangway, to be delivered to City
4. Other materials and equipment may be added to the list of salvaged items to be reused or delivered to the Owner for storage.

3.04 DEMOLITION - GENERAL REQUIREMENTS

- A. Perform work in accordance with ANSI A10.6 and regulatory requirements.
- B. The extent of demolition is identified on the Plans. The contractor shall not cause any physical or superficial damage to property which is not identified for demolition, both within the site and in the adjacent area. Reparations for any such damage shall be the responsibility of the contractor.
- C. The contractor shall be solely responsible for safety, adequacy and satisfactory performance of methods and means employed for demolition.
- D. The contractor shall identify and employ whatever means and materials necessary to prevent demolition debris from entering or remaining in the water, whether it is deemed hazardous or otherwise.
- E. The contractor shall identify and employ whatever means and materials necessary to prevent runoff from the demolition area from entering the water.

3.05 DEMOLITION MATERIAL AND DEMOLITION DEBRIS DISPOSAL

- A. All demolition materials shall be legally disposed of off-site. Locations of the site, permits, haul routes, and length of haul are the contractor's responsibility. Control and disposal of all demolition materials shall be solely the contractor's responsibility once the materials have been removed from the Owner's property.
- B. The contractor shall provide documentation to Owner for each load of demolition materials leaving the property confirming its receipt at the disposal site.
- C. Prior to commencing demolition work, the contractor shall prepare a Demolition and Disposal Plan for Owner's approval. This plan shall identify, as a minimum, the disposal site(s) which will receive the materials, documentation that the disposal site is approved for disposal of the demolition material, the manner by which its receipt at the disposal site will be documented, and the procedure for supplying the Owner with all appropriate documentation including bill(s) of lading.

3.06 WORK COMPLETION

- A. The demolition portion of the work shall be considered complete when the site is free of all demolition materials (including materials and equipment brought to site for the project) and the contractor has cleaned the docks, streets, parking areas, sidewalks, etc. as needed.

END OF SECTION

SECTION 02460
STEEL PIPE PILES

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The work in this Section shall include all labor, materials, tools and equipment necessary to furnish and install all bearing piles and float system piles, including cutting shoes, bird caps, and all other related work in accordance with the requirements of the Contract Documents and as shown on the Plans.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 05091 – Welding
- B. Section 05126 - Galvanizing
- C. Section 05500 – Metal Fabrications
- D. Section 05700 – Dock System

1.03 REFERENCES

- A. ASTM A252 - Welded and Seamless Steel Pipe Piles.
- B. AWS D1.1 - Structural Welding Code - Steel

1.04 SUBMITTALS

- A. Manufacturer's Mill Certificate: Steel Certification including chemistry, yield strength, and mill numbers.
- B. Shop Drawings for all fabricated items per Section 05500 – Metal Fabrication.
- C. Welding procedures. All weld metal proposed to be used in the shop or in the field shall be submitted and approved for use prior to construction. The submittal shall contain all required information and the manufacturer's recommendations for the use of the product on this Project.
- D. Welder Certificates - Certify welders employed in the work with AWS qualifications within the previous 12 months.
- E. Pile Installation Plan - Provide narrative and illustrations to fully describe complete installation plan. The plan shall address, as a minimum, all equipment, labor, temporary pile support and template systems, survey control, sequence and method of installation.
- F. Manufacturer's information on pile hammers intended for use, complete with satisfactory data to ensure properly suited for installation of pipe piles. The information shall include pile hammer type and driving method for all pile types, as well as manufacturer's recommendations and information on hammer cushion.

- G. In the event that pile installation using appropriately sized vibratory and impact hammers and methodologies fails to advance the pile to the full specified design embedment, socketing may be required. The Contractor shall be prepared to employ drilling methods to install piles as necessary.
- H. The Contractor shall not mobilize drilling equipment and pile driving hammers and related equipment prior to receiving written approval of the plan. All driving methods shall meet the requirements of the permits issued for this Project.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All steel pipe piles shall be seamless or straight seam pipe conforming to ASTM A252, Grade 3, $F_y = 52$ ksi, with ASTM A36 chemistry. Carbon Equivalency shall not exceed 0.45. No spiral weld pipe may be used.
- B. All pipe piles shall have a cutting shoe. Cutting shoe shall be APF inside flanged cutting shoe or equal, installed per manufacturer's recommendations.
- C. Fiberglass bird cap shall be Cheyenne Manufacturing or approved equal, sized to fit specified pile and attached firmly with appropriate adhesive.

PART 3 EXECUTION

3.01 PREPARATION

- A. All steel pipe piles shall be furnished, complete with pile tips, in the lengths indicated in the Pile Schedule. Piles shall be delivered full length or field spliced in accordance with approved welding procedures.

3.02 INSTALLATION

- A. All pile installations shall be conducted with the Engineer present. The Contractor shall assist the Engineer in monitoring the pile driving. The Contractor shall mark each pile with one-foot increments, with every five-foot increment numbered. The marks shall be visible and readable from all sides of the pile.
- B. Piles shall be supplied to provide the final length specified on the Pile Schedule. Contractor may field splice at their option. Piles shall be driven full length to cutoff elevation unless pile refusal or required pile capacity is obtained. Pile capacity will be determined solely by the Engineer.
- C. All steel pipe pile cutoffs greater than ten feet in length shall become the property of the Owner. The Contractor shall remove the pipe from the Project site and shall neatly stack the pipe, as approved by the Engineer, at a location to be within 5 miles of the Project site.

3.03 PILE DRIVING – FLOAT PILES

- A. All float piles shall be driven plumb through the pile hoops in such a manner to allow the float full movement through all water levels without binding. All float piles shall be driven with a vibratory hammer, APE 200 or equivalent, as required to obtain the necessary embedment. If

the pile is driven full length without achieving vibratory hammer refusal, a static load check shall be performed. The static load check shall consist of placing the entire weight of the APE 200 hammer on the pile without vibratory action and monitoring for movement. If movement occurs, the Contractor shall let the pile set for 24 hours and retest the pile with the static load test. If the pile again moves the Contractor shall splice a length of pile (length as determined by the Owner) and redrive the pile to its full length or hammer refusal (this work will be negotiated by change order). If driven full length, the static load test shall be performed again, otherwise cutoff to required length can be performed.

- B. If vibratory refusal occurs prior to complete embedment, the Contractor shall drive the pile with an impact hammer with a minimum energy of 30,000 ft-lbs and minimum lump weight of 4,000 lbs. The pile shall be driven its full length. If impact hammer refusal occurs prior to driving the pile to grade the pile may be cutoff at elevation, if at least 27 ft of embedment has been reached.
- C. If less than 27 ft of embedment is reached after this effort, pile will be evaluated and possible modifications may be necessary, including changes to installation equipment and methods, including drill and socket installation.

3.04 PILE DRIVING – BEARING PILES

- A. All bearing piles shall be driven plumb in their final position. All bearing piles shall be driven to required embedment. Once minimum embedment is achieved the pile will be proof driven to the ultimate capacity shown in the pile schedule. Ultimate capacity will be solely determined by the Engineer.
- B. The bearing piles shall be driven with a drop hammer with a minimum rated energy of 20,000 ft-lbs and minimum lump weight of 2,500 lbs. Any hammer that causes damage to the piles during driving operations shall be substituted with an acceptable alternate hammer at no additional expense to the Owner.
- C. Piles shall be placed within 1% of specified vertical alignment. Piles shall also be driven within 2-inches of plan location at cutoff elevation. Piles hitting obstacles, misaligned piles and piles that have not achieved minimum penetration prior to refusal shall be pulled by the Contractor with a vibratory hammer and redriven at no additional cost to the Owner. A vibratory hammer with the minimum requirements equivalent to an APE 200 must be available and on-site during all pile driving operations.

END OF SECTION

SECTION 02510
WATER SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide new potable water system and fire hose accessories. The extent of work consists of the entire system as shown on the Plans. The work is generally shown on the Mechanical "M" sheets of the Contract Drawings.
- B. Work shall include furnishing and installing all piping, hanger and support assemblies, valves, and other appurtenances necessary for complete construction and installation of the specified systems. The Contractor shall provide any additional system components not shown on the Plans which are required for installation or testing of the complete system. Any of these components which will become a permanent part of the installation shall be indicated in the pre-construction submittals and shown on the as-built drawings.
- C. Work also includes furnishing and installing dock safety ladders, fire extinguishers and cabinets, life rings and cabinets, related support structures and related signage as shown on the Plans.
- D. See Section 01025 – Measurement and Payment for bid item breakdown.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02900 – Dock Installation
- B. Section 05091 – Welding
- C. Section 05126 – Galvanizing
- D. Section 05500 – Metal Fabrications
- E. Section 05600 – Gangway
- F. Section 05700 – Dock System
- G. Section 16445 – Marine Power Pedestals

1.03 CODE REQUIREMENTS

- A. The work described herein shall comply with the following codes, as applicable. If requirements conflict between one code and another, or between any code and part of these Plans and Specifications, the more stringent requirement shall govern.
 - 1. International Building Code, latest edition, with local amendments
 - 2. Uniform Plumbing Code, latest edition, with local amendments
 - 3. National Fire Protection Association, NFPA 10,14, 303 and 307

1.04 STANDARDS

- A. Various sections of the specifications refer to published standards for the purpose of defining types of material, methods of construction, acceptable test procedures, etc. Mechanical work shall comply with these standards as applicable.
- B. The listing below is intended only to aid in the identification of various standards. The omission from this list of a standard called out elsewhere in the specifications or on the drawings is not to be construed as a deletion. The inclusion in this list of a standard not called out elsewhere is not to be construed as an additional requirement.
 - 1. ANSI - American National Standards Institute
 - 2. ASME - American Society of Mechanical Engineers
 - 3. ASTM - American Society for Testing and Materials
 - 4. AWWA - American Water Works Association
 - 5. MSS - Manufacturers Standardization Society of the Valves and Fittings Industry

1.05 CODES, PERMITS AND INSPECTIONS

- A. The work performed under these drawings and specifications shall comply with applicable local and state codes. These drawings and specifications shall not be interpreted in any way which requires or permits deviation from the requirements of such governing codes.
- B. The Contractor shall arrange and pay for all permits, fees and inspections required for execution of this work.
- C. The Contractor shall request and ensure completion of inspections required by the local authorities.

1.06 GENERAL INSTRUCTIONS

- A. The Contractor shall furnish all labor, materials, tools, equipment, test apparatuses, etc. necessary to complete the work described on these Plans and Specifications.
- B. The Contractor shall perform all work, whether indicated on the Contract Drawings only, in the Technical Specifications only, or on both the Contract Drawings and the Technical Specifications.
- C. The Contractor shall maintain a set of the Contract Drawings at the jobsite and mark them on a daily basis with as-built conditions. A reproducible set of these as-built drawings shall be provided to the Owner prior to project close-out, indicating all pertinent details of the as-built project.
- D. The Contractor shall request and receive written approval from the Owner prior to deviating from the Contract Documents.
- E. All pre-construction submittals described below shall be submitted to the Owner and approved prior to construction.

- F. All as-built drawings and test reports as described below shall be submitted to the Owner and approved prior to project close-out.

1.07 LOCAL CONDITIONS

- A. Examine site and become familiar with existing local conditions affecting work.
- B. Examine all drawings and specifications, including structural, and electrical, and become familiar with types and systems of construction to be used. Determine how such types and systems will affect installation of the potable water system.

1.08 SUBMITTALS

A. Pre-Construction Submittals

1. Manufacturer's data sheets for components listed under Section 2.01.
2. Manufacturer's data sheets for each component used to construct items A., B., and C. in Section 2.02.
3. Shop drawings for steel components and fabrications listed in Section 2.04.
4. Mark-up of one-line drawings indicating the locations of all HDPE flanged connections to be included which are not shown on the Plans.
5. Proof of training for on-site HDPE heat fusion operator(s).
6. Water system filling and pressure test procedures.
7. System disinfection procedure.

B. As-Built Drawings and Test Reports (prior to project close-out)

1. As-Built Drawings
2. Hydrostatic Test Reports
3. Water Quality Test Report

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. All sections of the potable water pipe shall be rated for 150 psi minimum working pressure. Potable water pipe shall comply with AWWA C901.

2.02 PIPE, VALVES AND FITTINGS

- A. High-Density Polyethylene (HDPE) Pipe and Fittings shall be made of black high-density polyethylene suitable for potable water use, having a standard thermoplastic material designation code of PE3408 and a cell classification of 345464C per ASTM D3350.
 1. Pipe shall conform to AWWA C-901 and constructed to nominal IPS sizes. Pipe sizes are specified on the Plans. Sizes specified are nominal IPS designations.
 2. HDPE fittings shall be molded butt fusion fittings per ASTM D3261.

- B. HDPE pipe shall be permanently marked in accordance with all applicable standards per this specification. Marking shall remain legible under normal handling and installation practices.

HDPE fittings shall be marked on body or hub in accordance with the applicable standard depending upon the fitting type.

- C. HDPE Flanged Connections (non-heat-fused joints) shall consist of a heat-fusion joined HDPE flange adapter end with a steel backing flange and gasket. The flanged connection assembly shall have a pressure rating equal to the pipe being joined. The backing flange shall be hot-dip galvanized carbon steel or stainless steel. Carbon steel backing flanges shall be galvanized per ASTM A123 or A153. Bolting for flanged connections shall be stainless steel.
- D. Shutoff Valves shall be Nordstrom Poly-Water polyethylene quarter-turn valves or approved equivalent. Shutoff valves shall be installed between HDPE flanged connections for removal as shown on the plans. Install labels on rubstrip above shutoff valves.
- E. Carbon Steel Pipe shall be seamless or welded Schedule 40 ASTM A53 Grade B carbon steel, hot dip galvanized per ASTM A123 or A153.
- F. Iron Screwed Fittings and Flanges shall be Class 150 malleable iron and shall be hot dip galvanized.
- G. Hose Bibs shall be 3/4", 125 psi CWP, brass body with metal handle, supplied with vacuum breaker, connected to 3/4" flexible water line by NPT x hose barb adapter. Hose bibs shall be installed in the Marine Power Pedestals (see Division 16). Contractor shall field verify proper installation of hose bib. Woodford, NIBCO, A. Y. McDonald or approved equal.
- H. HDPE-to-Steel Transition Fittings shall have a DR 11 HDPE butt fusion type end and a 316 stainless steel male NPT end and shall have a minimum working pressure equal to the pipe being joined. Poly-Cam, HC Fusion, HDPE Fittings or other approved manufacturer.
- I. 3/4" Transition Fittings shall have a DR 11 HDPE butt fusion type end and a brass male NPT end and shall have a minimum working pressure equal to the pipe being joined. Poly-Cam, HC Fusion, HDPE Fittings or other approved manufacturer.
- J. NPT x Hose Barb Adapters shall be brass or bronze, straight or angle as needed.
- K. 3/4" Flexible Water Line shall be food grade, UV resistant and suitable for use submerged and exposed in a salt-water marine environment and supplied with stainless steel clamps.

2.03 FLEXIBLE HOSES

- A. Flexible Water Line shall be a Goodyear Plicord Gray Food Hose or approved equivalent. Each end shall have fittings consisting of a Type 316 stainless steel Scovill coupling with hydraulically-crimped interlocking ferrules with a swivel. Flexible hoses and fittings at gangways shall meet the same pressure and integrity standard as the rigid pipe has shall be flexible and of sufficient length to adjust to maximum and minimum tide ranges.

2.04 PIPE MOUNTING BRACKETS, SUPPORTS, AND FASTENERS

- A. Pipe Clamps shall be hot dip galvanized carbon steel with stainless steel bolting, suitable for the size pipe specified on the Plans and for use with 1-5/8" wide strut channel. Power-Strut 1100 HDG or approved equivalent.
- B. Strut Channel shall be hot dip galvanized carbon steel of the size specified on the Plans.
- C. Channel Brackets shall be 12" Power-Strut PS 661 T2 galvanized, or approved equivalent.
- D. Pipe Mounting Brackets and Pipe Supports shall be fabricated and hot dip galvanized per the Contract Drawings and Section 05500 of these specifications. The contractor shall field verify the dimensional arrangement of the precast inserts in the owner-supplied floats prior to drilling the mounting holes for the bracket or support. Total quantity insert location for Pipe Supports are shown on float manufacturer's shop drawings.
- E. Galvanized Bolts for attachment of brackets and supports in the existing floats shall be per ASTM A307 and galvanized per ASTM A123. Contractor shall verify required bolt length based on installation location. Bolts shall be supplied and installed with washers.
- F. Stainless Bolts shall be 316 stainless. Contractor shall verify required bolt length based on installation location.

2.05 FIRE HOSE CABINETS

- A. The Fire Hose Cabinet shall a fiberglass cabinet that can accommodate a 2½" x 1½" Fire Hose Rack Assembly and fire extinguisher. Cabinet shall have non-locking T-handle, and color shall be red. Cabinet shall be Guardian Model 2715 or equivalent, and mounted to the steel bracket.
- B. The Fire Hose Rack Assembly shall contain brass components and the rack be standard red. Hose shall be 100 feet in length. Assembly shall be Guardian Model 3110 or equivalent.
- C. Each fire hose cabinet shall also be equipped with a fire extinguisher (see 2.07 below) stored within the cabinet.

2.06 LIFE RINGS AND CABINETS

- A. Life Rings: as approved by the U.S. Coast Guard. Cabinet, as manufacturer by Cheyenne Mfg., or equivalent, shall be included. Cabinets shall be mounted on a steel frame stand, attached to the floating dock framing.

2.07 FIRE EXTINGUISHERS

- A. Fire Extinguishers: a 10-lb unit with a minimum UL rating of 4A:20B:C, such as Amerex B402 or equivalent. Fire extinguishers shall be provided with an individual fiberglass extinguisher cabinet, mounted on a steel frame stand attached to the floating dock framing. The three extinguishers installed within the fire hose cabinets (see 2.05 above) do not require individual cabinets.

2.08 DOCK SAFETY LADDERS

- A. Dock safety ladders shall be Scandia Marine Products Model SL 1224 Up-N-Out “5 rung”, or approved equal, safety ladder. Ladders shall be field located and installed in the locations shown on the Plans and fastened to docks using stainless thru-bolts through dock walers.

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor shall develop plans for construction and installation of the HDPE water system and related components and submit the plan to the Owner prior to beginning construction. Refer to the Submittals section for specific requirements.
- B. The Contractor shall use the dock manufacturer's shop drawings and field checks as needed to develop plans for construction and installation of the water system on the new docks. Any clarification needed by the contractor where information is omitted or unclear on the dock manufacturer's shop drawings shall be requested from the Owner prior to proceeding further with planning or construction.
- C. Non-heat-fused joints in the HDPE piping shall be HDPE flanged connections. HDPE flanged connections which are required are shown on the Plans. Other HDPE flanged connections may be included as needed for constructability. The Contractor shall determine the requirements for such joints, with consideration given to initial installation and future removal in the instance a section of pipe is damaged.
- D. The Contractor shall provide any additional system components (valves, fittings, etc.) not shown on the Plans which are required for installation or testing of the complete system. Any of these components which will become a permanent part of the installation shall be indicated in the pre-construction submittals and shown on the as-built drawings.

3.02 INSPECTION AND HANDLING OF MATERIAL

- A. The Contractor shall be responsible for inspection, receipt and safe storage of materials at the jobsite prior to and during installation.
- B. HDPE pipe and fittings shall be inspected upon delivery to the jobsite. Materials shall be inspected for and be free of visible cracks, holes, foreign inclusions, blisters, dents, variations in color, or other physical defects.
- C. Purchased components shall be inspected upon receipt and kept fit for purpose by the Contractor prior to and during installation.

3.03 JOINING OF HDPE PIPE AND FITTINGS

- A. All joints between HDPE pipe and molded or fabricated HDPE fittings shall be heat fused (butt fused or saddle fused) according to the pipe manufacturer's procedures.
- B. HDPE flanged connections shall incorporate an HDPE flange adapter stub heat fused to the pipe sections to be joined.
- C. All personnel performing heat fusion of HDPE components shall have received up-to-date training by the Manufacturer or their approved Representative.

- D. All HDPE pipe shall be installed in a manner sufficient to accommodate for thermal expansion and contraction.

3.04 SYSTEM INSTALLATION

- A. The entire water and fire suppression piping systems shall be installed as shown on the Plans and kept depressurized until fully installed.
- B. All system components shall be installed according to the manufacturer's instructions, as applicable.
- C. All pipe brackets, supports, clamps and U-bolts shall be fully installed and the HDPE piping system shall be fully restrained at all of the attachment locations prior to applying any pressure to the systems.

3.05 FLUSHING

- A. The Contractor shall flush all water lines prior to pressure testing. Particular care shall be taken in flushing water from the lines to assure that the flushed and chlorinated water does no physical or environmental damage to property, streams, storm sewers or any waterways.

3.06 PRESSURE TESTING

- A. Hydrostatic testing at 150 psi shall be performed on the potable water system according to the HDPE pipe manufacturer's recommendations to check for leaks in the system.
- B. The Contractor shall submit a filling and hydrostatic test plan to the Owner for approval.
- C. Hydrostatic test reports shall be submitted to the Owner for approval prior to project close-out.

3.07 WATER SYSTEM DISINFECTION

- A. The Contractor shall disinfect the new water distribution system and any portion of the existing system subject to contamination during construction. The method of disinfection shall be according to AWWA C651.
- B. The Contractor shall submit water samples to municipal or state authorities for acceptance testing.
- C. A water quality test report shall be submitted to the Owner prior to project close-out.

END OF SECTION

SECTION 02900
DOCK INSTALLATION

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent and location of the Dock Installation work is indicated on the Plans. The work includes the requirements for transporting, assembling, placing and fully assembling the system of steel frame dock units and associated items required or indicated on the drawings.
- B. All work shall comply with the permits issued for this project and any subsequent modifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02460 – Steel Pipe Piles
- B. Section 02510 – Water System
- C. Section 05700 – Dock System
- D. Division 16000 - Electrical

1.03 SUBMITTALS

- A. Dock Assembly and Installation Plan: Provide narrative and illustrations to fully describe complete assembly and installation plan. The plan shall address, at a minimum, all equipment, labor, survey control, sequence and method of assembly and installation. In the event that installation of the docks occurs after pile installation, Contractor shall submit plan for dock installation on pre-installed piles.

1.04 QUALITY ASSURANCE

- A. The Contractor shall have experience in the assembly and installation of similar dock construction.

PART 2 PRODUCTS

2.01 PRODUCTS

- A. New dock system is a manufacturer designed system per the performance specifications provided in Section 05700 – Dock System.

PART 3 EXECUTION

3.01 PRODUCT HANDLING AND PROTECTION

- A. Docks shall be properly designed for loading, shipment, stacking and storage. Pre-assembled dock units shall be designed to be top lifted to facilitate placement into the water at the project site. The design shall incorporate structural elements or attachment points by which the docks may be safely lifted without damage to the dock structure or flotation. Lifting of the dock modules by straps placed underneath exposed or inadequately protected rigid float shells will

be strictly prohibited. The Supplier will provide written instructions and diagrams which indicate acceptable lifting, stacking and storage procedures.

- B. The Contractor shall be responsible for safe off-load and placement of all dock units at the delivery site including all necessary equipment, rigging, supports and dunnage. The Contractor shall assume full responsibility for any damages or losses resulting from the handling or transporting of dock units during loading, shipping, transport, delivery and unloading at the project site. Any dock unit damaged during transport and delivery and/or during other handling operations, prior to final acceptance, shall be repaired or replaced at the discretion of the Owner and at no additional cost to the Owner.
 - C. Delivered docks shall be stored no more than two high (one atop the other) and two docks deep. A detailed delivery plan will be prepared by the Contractor and provided to the Owner prior to delivery of the first dock section to be stored at the delivery site.
 - D. Protection: Use all means necessary to protect the dock materials before, during, and after installation and to protect the installed work and materials of all other trades.
- 3.02 DOCK ASSEMBLY AND INSTALLATION
- A. The Contractor shall coordinate a Dock Pre-Assembly Meeting to include the Owner, the Contractor, and dock manufacturer to discuss specific dock assembly procedures to be utilized to provide a full, complete and high-quality installation.
 - B. It is anticipated that docks will be anchored with piles driven through the dock pile hoops. However, it is possible that some docks may be installed on existing (pre-driven) anchor piles. Installation of any dock units on pre-installed piles will be at the Contractor's risk and shall take into account the exact position of the pile hoops in the final assembled Contractor furnished dock system. Contractor shall submit plan for dock installation on pre-installed piles.
 - C. Dock Assembling and Installation: Assemble and install all components of docks as shown on the Contract Drawings.
 - D. Docks may require ballasting, after installation, to account for all dead loads. Docks shall be furnished with sufficient extra freeboard and method for field ballasting to allow for floatation corrections to meet specifications.
 - E. Replacements: In the event of damage, immediately make all repairs and replacement necessary to the approval of, and at no additional cost to the Owner.

END OF SECTION

SECTION 05091
WELDING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Providing the welding materials and methods for shop and field welding.
- B. Providing Qualification testing of personnel and procedures.
- C. Providing welding inspection and NDT.
- D. Providing coordination, access, and material handling for the welding inspector.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02460 – Steel Pipe Piles
- B. Section 02510 – Water System
- C. Section 05126 – Galvanizing
- D. Section 05500 – Metal Fabrications
- E. Section 05600 – Gangway
- F. Section 05700 – Dock System

1.03 SUBMITTALS

- A. The following shall be submitted:
 - 1. Welder qualifications/certifications.
 - 2. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs).
 - 3. Electrode manufacturer's certifications and data sheets.
 - 4. Certificate of Compliance.
 - 5. Welding inspection and test reports.

1.04 QUALITY ASSURANCE

- A. Governing Specifications, Codes, and Standards
 - 1. American Welding Society, ANSI/AWS D1.1, "Structural Welding Code - Steel," referred to hereafter as AWS D1.1.
 - 2. American Welding Society, ANSI/AWS D1.2, "Structural Welding Code – Aluminum," referred to hereafter as AWS D1.2.
 - 3. American Welding Society, ANSI/AWS A5.

4. American Welding Society – AWS D19.0, "Welding Zinc-Coated Steel," referred to hereafter as AWS D19.0.

B. Qualifications

1. Welder Qualifications: All welders are required to be currently certified by AWS (American Welding Society) or WABO (Washington Association of Building Officials) for structural welding. Contractor shall submit proof of certification in accordance with Section 01330 – Submittal Procedures and Section 01340 – Submittals of these specifications. Welders shall be qualified for the weld types and positions to be welded.
2. The Contractor shall submit all Welding Procedure Specifications (WPSs) to be used on the project. For WPSs that are not prequalified per AWS D1.1 or D1.2, the supporting Procedure Qualification Record (PQR) shall also be submitted with the WPSs.
3. Procedures and welder qualification tests shall be witnessed by an AWS-certified welding inspector approved by the Owner. All tests shall be conducted in accordance with AWS D1.1 and D1.2.

C. Certifications

1. The Contractor supplying welding filler metal and shielding gas products shall submit copies of all Manufacturers' certifications for all electrodes, fluxes, and shielding gases to be used. Certifications shall satisfy the applicable AWS A5 requirements. The Contractor shall also submit the manufacturer's product data sheets for all welding material to be used. The data sheets shall describe the product, limitations of use, recommended welding parameters, and storage and exposure requirements, including baking and rebaking, if applicable.
2. Certificate of Compliance: For all welding electrodes used on the project the contractor shall submit a Certificate of Compliance. The certificate of compliance shall be a letter stating that the Contractor has reviewed the submitted manufacturer's certifications and test reports, and that the materials being furnished for the project are in conformance with the applicable standards, specifications, and project documents.

D. Testing and Inspection: NDT and inspection of welds shall be performed in accordance with this section.

1. Definitions

- a. The manufacturing plant shall be the place where steel materials are fabricated. The storage yard shall be the supplier's storage location. In addition, storage yard shall mean the Contractor's storage area if these facilities are more than 100 miles from the construction site.

2. Verification Inspection

- a. The Contractor shall employ an independent inspection and testing agency to perform verification inspection and testing on all field and shop welding. The Contractor's selection of independent testing agency shall be subject to the approval of the Owner. Field and shop welding shall be considered all welding not performed at the manufacturing plant or storage yard. The cost associated

with employing an independent inspection and testing agency shall be included in the lump sum bid price for the item of work.

- b. The Contractor shall be responsible for assisting the inspector in accessing the welds. The Contractor shall remove all slag from each weld. The inspector may elect to test any portion of the joint. If the portion of the joint to be tested by the inspector is inaccessible without the aid of heavy lifting equipment or additional assistance, the Contractor shall provide the equipment and personnel necessary to allow inspection of the work. The cost associated with providing the inspector access to the work shall be included in the lump sum bid price for the item of work.
- c. The independent testing agency shall perform NDT and inspection on each (field and shop) weld. The independent testing agency shall have a verification inspector with current certification as an AWS-Certified Welding Inspector (CWI) in accordance with the provisions of AWS QC1.
- d. The inspection procedures, techniques, and methods shall be in accordance with AWS D1.1, Section 6, and AWS D1.2 as applicable.
- e. Each (field and shop) weld shall be subjected to 25% visual inspection.
- f. Records verifying that the above tests were performed and that all tested welds met the acceptance criteria shall be provided to the Owner.
- g. The welding Inspector shall have the authority to determine compliance with the above acceptance criteria and order repairs or replacements of unacceptable welds at no additional cost to the Owner. All welds whether made at the manufacturing plant, storage yard, in the shop or field shall be subject to the acceptance of the Welding Inspector.
- h. If welds are repaired or removed and replaced, they shall be re-examined by the welding inspector and records of compliance with the acceptance criteria shall be provided to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Electrodes

1. All electrodes, fluxes, and shielding gases shall meet the requirements of the applicable sections of ANSI/AWS A5. Only low hydrogen electrodes shall be used. Low hydrogen electrodes shall be defined as giving a diffusible hydrogen content of less than 10 ml/100g of deposited weld metal when measured in accordance with ISO 3690-1976, or a moisture content of electrode covering of 0.4% maximum in accordance with AWS A5.1.
2. Toughness, Strength, and Elongation: Weld filler metal shall meet the following minimum mechanical property requirements:

- a. Charpy V-Notch (CVN) toughness of 20 feet-pounds at 0 degrees F or below using AWS A5 Classification test methods.
- b. Yield Strength: 58 ksi minimum.
- c. Tensile Strength: 70 ksi minimum.
- d. Elongation: 22 percent minimum.

2.02 PRODUCT HANDLING

- A. Welding electrodes shall be packaged, stored, and used in a manner consistent with AWS D1.1 and the electrode manufacturer's specifications.

PART 3 EXECUTION

3.1 PREPARATION

- A. Fabrication and joint preparation shall be in accordance with AWS D1.1 and D1.2.
- B. Hold back or remove all galvanizing a sufficient distance from the joint to prevent inclusion of the material into the weld. Galvanizing shall be removed from the joint in accordance with AWS D19.0.
- C. Protection
 - 1. Work shall comply with all municipal, state, and federal regulations regarding safety, including all applicable portions of OSHA and State safety standards for construction work.
 - 2. Conform to ANSI Z49.1, "Safety in Welding, Cutting, and Allied Processes," published by the American Welding Society.
 - 3. Follow "Safe Practices" recommended in Annex J of AWS D1.1

3.02 WELDING PROCEDURES

- A. Perform all work in accordance with procedures written and qualified in accordance with AWS D1.1 and D1.2 requirements.
- B. Use a maximum preheat and maximum interpass temperature of 550 degrees F, measured at a distance of 1 inch from the point of arc initiation. This maximum temperature may not be increased by the WPS, regardless of qualification testing.

3.03 FIELD QUALITY CONTROL

- A. Field and shop welding shall meet the requirements of AWS D1.1 and D1.2.

3.04 SCHEDULING

- A. The Contractor shall coordinate the work with the welding Inspector. The Contractor shall provide the Owner with a proposed work schedule and shall coordinate the work to meet the contract delivery schedule.

3.05 CLEANING

- A. Clean in accordance with AWS D1.1 and D1.2 requirements.

3.06 REPAIR

- A. Making weld repairs or replacements shall be the responsibility of the Contractor, and shall be at no additional cost to the Owner.
- B. Weld repairs or replacements on butt splice welds shall be performed in accordance with AWS D1.1 and D1.2 requirements for cyclically-loaded tubular connections in tension.
- C. Repair all galvanizing removed or damaged during welding in accordance with Section 05126 - Galvanizing, of these specifications and as directed by the Owner, or replace damaged items at no additional cost to Owner.

END OF SECTION

SECTION 05126
GALVANIZING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The work includes the requirements to provide a galvanized coating as specified with all handling, prefinishing, cleaning, pickling, rinsing, dipping, cooling, draining, vibrating, centrifuging, inspection, and other processes or materials required.
- B. The work includes repair of removed or damaged galvanized coatings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 05091 – Welding
- B. Section 05500 – Metal Fabrications

1.03 REFERENCES

- A. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- B. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware

1.04 SUBMITTALS

- A. Submit manufacturers product data sheets for “or approved equal” product substitutions.

1.05 QUALITY ASSURANCE

- A. Governing Specifications, Codes, and Standards
- B. The provisions and intent of the contract, including the General Conditions and General Requirements, apply to this work as if specified in this section.
- C. Galvanizing shall be in accordance with applicable ASTM standards.
- D. The Manufacturer shall be required to test the finished product for thickness, uniformity of the coating, and adhesion in accordance with the applicable ASTM standard.
- E. Conform to manufacturers' specifications, directions, and recommendations for best results in the use of each of their products for each condition. If results are at variance with these specifications, report the discrepancy to the Owner for decision.

1.06 PRODUCT HANDLING

- A. Repair or replace damaged work, if any, as necessary to the approval of the Owner and at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 GALVANIZING

- A. All items designated as galvanized on the plans shall be hot-dip galvanized in accordance with ASTM A123 and A153, unless noted otherwise.
- 2.02 GALVANIZING REPAIR
- A. Zinc-based solder repair stick shall be “Zaclon Repair Alloy” or approved equal.
 - B. Cold Galvanizing compound shall be “ZRC Cold Galvanizing Compound” or approved equal.

PART 3 EXECUTION

3.01 FABRICATION

- A. Any drain holes, vent holes, or other measures required to produce a high-quality galvanized coating with minimal warpage and distortion not indicated on the contract plans shall be identified by the coating manufacturer, clearly shown on the shop drawings, and shall be subject to approval by the Owner. Fabrication shall be in accordance with ASTM A384 and ASTM A385.

3.02 REPAIR OF GALVANIZED COATINGS

- A. Galvanized coatings damaged due to fabrication, welding, material handling or occurring during installation shall be repaired by using the following hot-applied repair stick method:
 - 1. Repair sticks shall be zinc-cadmium alloys (melting point 518 degrees - 527 degrees F) such as “Rev-Galv”, or zinc-tin-lead alloys (melting point 446 degrees - 600 degrees F) such as “Galv-Weld”, “Zilt”, and “Galv-over”. The zinc-tin -lead alloys shall comply with U.S. Federal Specification O-G-93 and contain fluxing agents.
 - 2. Remove welding slag by chipping hammer and clean weld or damaged area by vigorous wire brushing.
 - 3. Preheat the region to be repaired by means of an oxyacetylene torch or other convenient method to between 600 degrees F and 750 degrees F. The alloys do not spread well at temperatures lower than 600 degrees F. Also, as temperatures rise above 600 degrees F increasing amounts of dross form.
 - 4. Wire brush surface again.
 - 5. Apply coating by rubbing bar of the alloy over the heated surface while it is hot enough to melt the alloy.
 - 6. Spread the molten alloy by briskly wire brushing or rubbing with a flat edge strip of steel or palette knife. Minimum thickness of applied zinc stick material shall be 12 mils.
 - 7. Remove flux residues by wiping with a damp cloth or rinsing with water.
 - 8. Brush apply two top coats of zinc rich paint, ZRC or equal (cold galvanize repair).

END OF SECTION

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The extent and location of the Metal Fabrications work is indicated on the Plans. The work includes the requirements for providing all miscellaneous iron, steel, aluminum, or other non-ferrous metals as shown or described in the drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02460 – Steel Pipe Piles
- B. Section 02510 – Water System
- C. Section 05091 – Welding
- D. Section 05126 – Galvanizing
- E. Section 05600 – Gangway
- F. Section 05700 – Dock System
- G. Section 05900 – Spray Metalized Coatings

1.03 REFERENCES

In addition to complying with all pertinent codes and regulations, comply with:

- A. American Welding Society (AWS)
 - 1. AWS D1.1 Structural Welding Code - Steel
 - 2. AWS D1.2 Structural Welding Code – Aluminum
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM A36 - Structural Steel
 - 2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
 - 3. ASTM A108 - Steel Bars, Carbon Cold-Finished, Standard Quality
 - 4. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products
 - 5. ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware
 - 6. ASTM A325 - High Strength Bolts for Structural Steel Joints
 - 7. ASTM F593 - Stainless Steel Bolts, Hex Cap Screws, and Studs
 - 8. ASTM F594 - Stainless Steel Nuts

1.04 SUBMITTALS

Before metal fabrications are delivered to the job site, submit shop drawings to the Owner. Shop drawings shall show all locations, markings, quantities, materials, sizes and shapes and indicate all methods of connecting, anchoring, fastening, bracing and attaching to the work of other trades.

- A. Fabrication Shop Drawings of all fabricated steel and aluminum items prior to fabrication
 - 1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld
 - 2. Include details of cuts, connections, splices, camber, holes and other pertinent data
 - 3. Indicate type, size and length of bolts, distinguishing between shop and field bolts
- B. Manufacturer's mill certificates for all steel and aluminum used shall include chemistry, yield strength, and mill numbers
- C. Galvanizing certifications
- D. Galvanizing repair methods and materials
- E. Welding procedures
- F. Welder certifications: certify welders employed in the work and verify AWS qualifications
- G. Provide fabrication shop QA/QC plan for review by Engineer. Provide qualification data for firms and/or persons to demonstrate their capabilities and experience. Include lists of projects and project names and addresses, and contacts.

1.05 QUALITY ASSURANCE

- A. Fabricate and install structural steel in accordance with AISC Code of Standard Practice.
- B. Fabricate and install aluminum in accordance with Aluminum Association Aluminum Design Manual.
- C. Quality Assurance: The metal fabricator must have an ongoing quality assurance program approved by a qualified, independent source. At the option of the Engineer, the fabricator shall submit a copy of their operational quality assurance program, and shall not begin fabrication until the Engineer has approved this quality assurance program. The objectives of the quality assurance program are as follows:
 - 1. Completed products shall conform completely to all governing codes and specifications stipulated in the Plans and specifications.
 - 2. Quality Assurance Program is an integral part of the ongoing manufacturing activities of the Fabricator. Although periodic inspections will be carried out by the Engineer, the purpose of these inspections is to note general conformance to the design documents. It is still the responsibility of the fabricator to produce a quality product, in complete conformance with the design documents, and to document and correct any non-conformance. All

documentation, including that submitted, shall be kept on file by the fabricator, for review, if requested by the Owner or Engineer.

- D. Fabrication Facility. The fabrication facility shall provide the proper environment and physical conditions necessary for welding, cutting, and general metal fabrication. The facility shall provide adequate work space, equipment, level surfaces, and protection from wind, moisture and freezing. The fabricator shall have the capability to carry out the following work in-house or on a contract basis:

1. Design of lifting and erection devices not shown on the Drawings.
2. Preparation of shop fabrication Drawings.
3. Receiving, checking and storing of materials for metal fabrication.
4. Dimensional checking and verification.
5. Resolution of non-conformities.
6. Documentation of all stages of Work with capability of tracing all major components.
7. Finishing, repairing, storing and shipping.

- E. Fabricator Qualifications:

1. Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work. Shop welding procedures and qualifications shall be submitted for review by the Engineer.

- F. Welding Standards:

1. Comply with applicable provisions of AWS D1.1 Structural Welding Code - Steel, current edition, and AWS D1.2 Structural Welding Code – Aluminum, current edition.
2. Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
3. Submit welding procedures in accordance with AWS Structural Welding Codes.

1.06 PRODUCT HANDLING

- A. Deliver materials to Fabricator's shop in such quantities and at such times to ensure continuity of installation.
- B. Store materials to permit easy access for inspection and identification. Materials shall be protected during shipping and handling. Materials shall be stored above ground on pallets, platforms or other supports. Materials shall be kept clean and properly drained. Long members shall be adequately supported on skids to prevent damage from deflection.
- C. Store fasteners in a protected place. Clean and re-lubricate bolts and nuts that become dry or rusty before use.

- D. Do not store materials or assembled structures in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.
- E. Protection: Use all means necessary to protect miscellaneous metal materials before, during and after installation and to protect the installed work of other trades. Make no marks on exposed metals during fabrication or erection.
- F. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner and at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 GENERAL

- A. Unless otherwise noted or specified, all products shall be new, free from oxidation or corrosion and the best quality for the intended use.
- B. All materials for metal fabrication shall conform to the Contract Documents and as shown on the Plans. Purchase orders shall contain all necessary information to verify that materials purchased comply with the fore mentioned documents. The Fabricator shall inspect all materials, upon arrival, for conformance with the purchase orders. The Fabricator shall confirm that mill certificates and test reports are provided and that they correctly identify the materials delivered. If a supplier proposes a substitute for any material, the proposed substitution shall be submitted to the Engineer for approval prior to commencing any Work involving use of the proposed substitute material.
- C. Supplier must be prepared to supply materials as identified on the design documents if the proposal for a substitution is not approved by the Engineer.

2.02 STEEL FABRICATIONS

- A. All steel fabrications shall be in accordance with ASTM A36 or ASTM A572. Cold formed hollow structural sections shall be in accordance with ASTM A500, Grade B. All steel fabrications and components shall be hot-dipped galvanized after fabrication in accordance with ASTM A123. Touch up galvanizing shall be in accordance with ASTM A780, hot stick repair using zinc-based alloys.

2.3 ALUMINUM FABRICATIONS

- B. Aluminum shall conform to 6061-T6 and 6063-T6, as specified and shall meet the requirements presented in Section 05600 – Gangways.

2.03 BOLTS AND MISCELLANEOUS HARDWARE

- A. Unless otherwise noted, all bolts shall be ASTM A307, hot-dip galvanized. Washers are required under both the head and nut of all bolts, unless otherwise noted. All nuts and washers shall be hot-dip galvanized. Plate washers, with a diameter equivalent to a malleable iron washer, shall be used in all areas where the bolt head or nut bear against wood, except under economy head bolts. All bolts called out as ASTM A325 shall be hot-dip galvanized. A325 bolts shall be installed

per AISC turn-of-nut method, or other Engineer-approved method, unless otherwise indicated on the Drawings.

- B. All bolts, nuts, washers, screws, and miscellaneous hardware called out as Stainless Steel shall be Type 316 Stainless Steel conforming to ASTM F593 and F594 as applicable.
- C. All nails shall be hot-dip galvanized
- D. Shear studs shall conform to ASTM A108, Grade 1015, and welded per AWS D1.1.

2.04 METAL COATINGS

- A. Unless otherwise noted, all steel shall be hot dip galvanized in accordance with ASTM A123 or A153 as appropriate.

PART 3 EXECUTION

METAL FABRICATION

- A. Shop Inspection:
 - 1. The Contractor shall furnish the Engineer with 30 days' notice of the beginning of Work at the mill or in the shop so that special fabrication inspections may be scheduled by the Engineer.
- B. Fabricate and assemble components in a shop, to greatest extent possible. Workmanship and finish shall be equal to the best industry standards and in accordance with the requirements of AWS, AISC, and The Aluminum Association, as applicable.
 - 1. Mark and match-mark materials for field assembly.
 - 2. Fabricate for delivery in a sequence that will expedite erection and minimize field handling.
 - 3. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 4. Holes: Drill holes perpendicular to metal surfaces; do not flame-cut holes or enlarge holes by burning.
 - 5. Aluminum Fabrication: Edges shall be cut true, smooth and free of burrs. Flame cutting is not permitted. Corner edges shall be ground smooth. Holes shall be drilled or punched. Weld spatter and flash marks shall be removed and ground smooth. Mill stamps and markings shall be removed from all exposed surfaces.
- C. Structural material, either plain or fabricated, shall be stored at the fabricating shop above ground, on platforms, skids or other supports. It shall be kept free from dirt, grease or other foreign matter, and shall be protected, as far as practical, from corrosion.
- D. All holes required for steel hot-dip galvanizing shall be clearly identified on the Shop Fabrication Drawings for Engineer review and approval. Fabricator shall coordinate with Galvanizer to determine size and quantity of holes required. Some, or all of the holes, may be required to be fully repaired per AWS D 1.1, at the discretion of the Engineer.

3.02 METAL ERECTION

- A. General: The Contractor shall provide and later remove all falsework, temporary shoring, and bracing necessary for erection and to complete assembly. All such devices shall be properly designed and constructed by the Contractor to meet anticipated construction and handling loads.
- B. Handling and Storing of Materials: Material to be stored shall be placed on skids above the ground. It shall be kept clean and properly drained. Handling and erection procedures shall be conducted in a manner to avoid over stressing any structural element. Stress and deflection calculations shall be provided by the Contractor, as deemed necessary by the Engineer, for any erection procedure.
- C. Method and Equipment: Before starting the Work of erection, the Contractor shall inform the Engineer fully as to the method of erection proposed, and the amount and character of equipment proposed to be used. Approval by the Engineer shall not be considered as relieving the Contractor of the responsibility for the safety of his method and equipment, or from carrying out the Work in full accordance with the Plans and Specifications.
- D. Assembling: Metal parts shall be accurately assembled as shown on the Plans, following applicable Industry Standards, Codes, erection Drawings and fabricators' match-marks. Excessive force or manipulation of parts shall not be allowed as determined by the Engineer. The material shall be carefully handled so that no parts will be bent, broken, or otherwise damaged. Hammering, which will injure or distort the members will not be permitted. Bearing surfaces shall be cleaned before the members are assembled.
- E. Bolt Holes and Bolting: Bolt holes and bolting shall follow the requirements as stated on the Plans and as indicated by applicable Industry Standards and Codes.
- F. Welding: All welding shall be in accordance with AWS D1.1 or AWS D1.2, current edition, as applicable. All welders shall be qualified per AWS for the type of welding anticipated. Welds will be spot tested by the Engineer by VT, MT, or UT and any welds which fail shall be repaired at the Contractor's expense, which will also include all costs for retesting. No welding through galvanized coatings will be permitted. The galvanizing within one inch of the weld shall be removed and repaired, after welding, according to these Specifications. All weld filler metal shall have chemistry similar to the base metal and shall have a minimum Charpy Impact Test Value of 20 ft-lbs. at -20 degrees F and have chemistry similar to the base metal. Filler metals shall only be used in welding positions recommended by the manufacturer. Welding materials shall be stored, and the condition maintained, according to AWS.
- G. Galvanize Repair: Galvanized coatings damaged due to fabrication, welding, material handling or occurring during installation shall be repaired by using the procedure specified in Section 05126 – Galvanizing.

END OF SECTION

SECTION 05600
GANGWAY

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. Work in this Section shall include all labor, materials, tools and equipment necessary for design, fabrication, transport, delivery, and installation of the complete aluminum gangway as shown in the Plans. Gangway consist of the gangway structure, grating, transition plate assemblies, hinge assemblies, skid guides, and all other miscellaneous appurtenances and hardware in accordance with the requirements of the Contract Documents and as indicated on the Plans.
- B. Gangway is a product to be designed, fabricated, and installed by the Contractor.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02510 – Water System
- B. Section 05091 – Welding
- C. Section 05500 – Metal Fabrications
- D. Division 16000 - Electrical

1.03 REFERENCES

- A. ASTM (American Society for Testing and Materials) Specifications.
- B. The Aluminum Association (AA) – Aluminum Design Manual: Specifications and Guidelines for Aluminum Structures.
- C. ASTM B209 – Standard Specifications for Aluminum and Aluminum-Alloy Sheet and Plate.
- D. ASTM B210 – Standard Specifications for Aluminum and Aluminum-Alloy Drawn Seamless Tube.
- E. ASTM B221 – Standard Specifications for Aluminum and Aluminum-Alloy Bar, Rod, Wire, Profiles and Tubes.
- F. ASTM B241 – Standard Specifications for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Tube.
- G. ASTM B308 – Standard Specifications for Aluminum and Aluminum-Alloy 6061-T6 Standard Structural Profiles.
- H. AWS D1.2 – Structural Welding Code - Aluminum.

1.04 SUBMITTALS

- A. Gangway Calculations: Contractor shall submit design calculations, prepared by an engineer, substantiating that the design meets the following design criteria. Calculations shall be stamped and signed by a qualified engineer.

1. Dead Load: The dead load shall consist of all fixed components permanently attached to the gangway.
 2. Live Load: The live load for gangway structural capacity shall be a uniform 100 psf on all walking surfaces of the gangway. [Note live load requirement on gangway for floatation support only, is different from this loading, and is described in Section 05700.]
 3. Utility Load: An allowance of 50 lbs per lineal foot shall be included for utilities.
 4. Wind Loads: The design wind shall be 100 mph, 3-second gust, exposure category C, from any direction.
- B. After Notice to Proceed, Contractor's gangway supplier shall provide drawings and calculations conforming to the plans and specifications sealed by a Registered Engineer in the State of Oregon. The Owner shall evaluate the acceptance of the proposed design and determine its acceptance.
- C. Fabrication Shop Drawings of all fabricated steel and aluminum items prior to fabrication.
1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length and type of each weld.
 2. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 3. Indicate type, size and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tension, or tensioned shear/bearing connections.
- D. Welding Procedures and Welder Certifications.
- E. UHMW (Ultra High Molecular Weight) Polyethylene Component Material Specifications and Shop Drawings.

1.05 QUALITY ASSURANCE

- A. Fabricate and install aluminum in accordance with Aluminum Association Aluminum Design Manual.
- B. Welding Standards: Comply with applicable provisions of AWS D1.2 Structural Welding Code – Aluminum.
1. Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
 2. Submit welding procedures in accordance with AWS Structural Welding Codes.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All material shall be as specified on the plans and listed in this specification. The top chords, bottom chords, webs, and deck members shall be aluminum, conforming to AA 6061-T6, unless otherwise noted. Aluminum plate shall conform to AA 5086-T116. Aluminum pipe for gangway rails shall be AA 6063-T6.

- B. All Ultra High Molecular Weight (UHMW) Polyethylene components shall be manufactured from virgin polyethylene material, be U.V. stabilized and shall be partially cross-linked. UHMW components shall be black in color, unless otherwise noted. Transition plate nosings shall be yellow in color.
 - C. Transition Plate: Acceptable non-slip surfaced product shall be “Act-Plate”, “Fiberplate” or approved equal. Color of plate shall be gray.
 - D. Grating: Grating used on gangway shall be Fibergrate Ecograte®62 molded fiberglass grating, or approved equivalent, meeting the following requirements.
 - 1. Open area of grating shall be at least 60%. A sample shall be submitted for approval, if requested.
 - 2. Spacing between load bars shall meet ADA guidelines and be no larger than ½ inch.
 - 3. Grating shall have a coarse grit coating and be gray in color. Surface shall not have indications of delamination at end of warranty period.
 - E. Fasteners: Provide fasteners of size and type per manufacturers requirements and recommendations for grating and transition plate.
 - F. Dissimilar Isolation: Provide isolation washers and bushings between dissimilar metals.
 - G. All materials shall conform to good workmanship, acceptable industry standards and manufacturer’s recommendations.
- 2.02 DELIVERY, STORAGE, AND PROTECTION
- A. Deliver materials to Fabricator’s shop in such quantities and at such times to ensure continuity of installation.
 - B. Store materials to permit easy access for inspection and identification. Keep materials off ground by using pallets, platforms, or other supports.
 - 1. Store fasteners in a protected place. Clean and re-lubricate bolts and nuts that become dry or rusty before use.
 - 2. Do not store materials or assembled structures in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 3 EXECUTION

3.01 FABRICATION

- A. The complete gangway assemblies shall be constructed as shown on the plans. Any gangway materials damaged during transport and delivery and/or during handling and fabrication operations shall be repaired or replaced by the fabricator, at the discretion of the Engineer, and at no additional cost to the Owner.

- B. Fabricate and assemble components in a shop, to greatest extent possible. Workmanship and finish shall be equal to the best industry standards and in accordance with the requirements of AWS, AISC, and The Aluminum Association, as applicable.
- C. All aluminum welding shall be according to AWS D1.2, as applicable.
- D. Aluminum Fabrication: Edges shall be cut true, smooth and free of burrs. Flame cutting is not permitted. Corner edges shall be ground smooth. Holes shall be drilled or punched. Weld spatter and flash marks shall be removed and ground smooth. Mill stamps and markings shall be removed from all exposed surfaces.

3.02 TRANSPORT AND DELIVERY

- A. The Contractor shall assume full responsibility for any damages or losses resulting from the handling or transporting of the gangways during loading, shipping, transport and delivery to the project site as well as the subsequent handling required on site for installation.
- B. Damage that occurs during transport and delivery and/or during other handling operations prior to final acceptance shall be repaired or replaced by the Contractor at the discretion of the Engineer and at no additional cost to the Owner.

3.03 INSTALLATION

- A. The complete gangway assemblies shall be installed as shown in the plans or to the highest industry standards if not fully shown on the plans.
- B. Following complete installation of gangway and all other associated work, Contractor shall lubricate gangway skids, as directed by the Engineer, with an Engineer approved, graphite-based lubricant.
- C. Construction methods and products not specifically mentioned in these Contract Documents shall be utilized using reasonable care and the highest quality construction practices. Final inspection and acceptance of all work and products not specifically mentioned in these Contract Documents shall be made by the Engineer. Approval shall be based upon conformance to the Contract Documents, quality of workmanship, applicable industry standards, and pertinent manufacturer's recommendations.

END OF SECTION

SECTION 05700
DOCK SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. The Dock System is a product to be designed, fabricated, and installed by the Contractor.
- B. Dock System shall include all materials, delivery, submittals, equipment, and labor necessary for fabricating, constructing and installing, and finishing the steel framed dock system as shown on the Plans.
- C. The Plans depict the minimum requirements for the float dimensions, pile hoop locations, cleat spacing, grating, layout, rubstrip, utility placement and arrangement, etc. Dock designer shall select a framing system, floatation arrangement, hinge detail, etc. that meets the requirements below.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02460 – Steel Pipe Piles
- B. Section 02510 – Water System
- C. Section 02900 – Dock Installation
- D. Section 05091 – Welding
- E. Section 05500 – Metal Fabrications
- F. Section 05600 – Gangway
- G. Division 16000 - Electrical

1.03 REFERENCES

- A. ASTM (American Society for Testing and Materials) Specifications.
- B. AWS D1.1 – Structural Welding Code - Steel.

1.04 SUBMITTALS

- A. Shop Drawings: Contractor shall submit a framing plan for review by the Owner. The shop drawings shall include a layout plan, profile and cross sections. The plan shall show the dimensions of the framing and member sizes; flotation material, locations, and fastening; and deck grating, pile hoops, hinges, fit up and weld details and all other details required to furnish the dock system as specified and shown in the plans.
- B. Review and approval of submittals by the Owner shall not relieve the Contractor of full responsibility for accuracy of dimensions and details. The Owner's review and approval of a submittal shall not relieve the Contractor from responsibility for errors or omissions in the submittal.

- C. Calculations: Contractor shall submit design calculations, prepared, stamped and signed by a Registered Engineer in the State of Oregon, substantiating that the float design meets the following design criteria. The Owner shall evaluate the acceptance of the proposed design and determine its acceptance.
1. Freeboard Criteria: The design average freeboard under dead load only shall be a minimum of 16 inches and a maximum of 18 inches. The average freeboard shall be based on the freeboard at the four corner points of any single-dock unit, within fully assembled dock system. Structural frame members shall be a minimum of 4 inches above the water under dead load for the life of the dock system. When a 400-pound load is applied along the dock centerline, 2 foot from the outer end, there shall be no more than 4 inches loss of freeboard at the end of the dock.
 2. List: The steady state condition of the dock, without live load, shall not exceed a cross slope 1 inch in 6 feet.
 3. Structural Criteria: The dock system shall be designed to withstand minimum uniformly distributed environmental and impact loads acting on the above-water profile of the docks, including the effects of wind applied to the design vessel. The dock system shall be designed for lifting and handling during installation. The pile design is exclusive of the floating dock calculations.
 4. Loads:
 - a. Dead Load: The dead load shall consist of the dock system frame, rubstrips, hinges, pile hoops, attachment hardware, utilities, and all other equipment permanently attached to the dock. The design self-weight of the new gangway (Contractor designed per Section 05600) shall be included in the static dead load calculation for the floating dock system, both for structural capacity as well as freeboard calculations.
 - b. Live Load Floatation: For purposes of floatation, the live load shall be a uniform 20 psf on all surfaces of the docks. The design live load from the new gangway (see Section 05600) with regards to floatation support, shall consider a uniform 20 psf on the gangway.
 - c. Impact Load: The impact load shall be the equivalent of a 50-foot-long craft, weighing 75,000 lbs, approaching the dock at a 10-degree angle at a velocity of 1 foot per second.
 - d. Environmental Loads: The design vessel length for the dock system varies from 25 feet to 55 feet, as shown in the plans. The design wind shall be 100 mph, 3-second gust, exposure category C, from any direction. The design maximum wave height is 1.0 foot with a wave period of 17 seconds. The tidal current is assumed to be 3.5 foot per second at this site.
 - e. Tsunami Load: In addition, a tsunami induced steady current of 8.2 foot per second, acting clockwise in the harbor is predicted and shall be accounted for as part of the design criteria.

5. Load Cases:

a. Load cases shall include, but are not limited to:

- (1) Case 1: Dead Load + Uniform Live Load
- (2) Case 2: Dead Load + Point Live Load
- (3) Case 3: Dead Load + Wind Load
- (4) Case 4: Dead Load + 0.75 Wind Load + Wave Load + Current Load
- (5) Case 5: Dead Load + Berthing Impact
- (6) Case 6: Dead Load + Tsunami Load

b. The above load cases shall be applied at a minimum, plus any others, as determined by the dock design engineer of record.

D. Material submittals shall, at a minimum, include the following:

1. Steel materials
2. Grating and fasteners
3. Polytub floatation
4. UHMW materials at pile guides and HDPE for rubstrips
5. Cleats

E. Manufacturers Resume: Contractor to submit manufacturer's and engineer's resumes stating qualifications per Section 1.05, below, and documenting work experience.

F. Welding Procedure

G. Welder Certification: Certify welders employed in the work, verifying AWS qualification within the previous 12 months.

H. Detailed description of dock handling, transport and delivery procedures.

1.05 QUALIFICATIONS

A. The dock system shall be fabricated by a manufacturer that has a minimum of five consecutive years of experience in fabricating and installing similar dock systems and shall provide references from three recent similar projects.

B. The engineer for the dock system shall be a professional engineer registered in the State of Oregon. The engineer shall have at least ten years of work experience in the design of dock structures.

C. Welders of the dock system shall be certified in accordance with AWS D1.1 for steel welding, and current qualifications shall be submitted for each welder.

PART 2 PRODUCT

2.01 FRAMING

- A. All structural members shall be per Section 05500 – Metal Fabrications, including tubes, plates, angles and pipe.
- B. Dock framing shall be designed to carry all applied lateral and torsional forces without depending on polytub floatation or deck material for diaphragm stiffness.
- C. Non-conductive isolators shall be used for separation of any dissimilar metals.

2.02 FLOATATION TUBS

- A. Flotation tubs (Polytubs) shall be Premier Materials Technology (Manufactured by ACE Roto-Mold) (800-262-2275) or Engineer-approved equivalent.
- B. Polytub encasement shall provide 100% protection to all surfaces of the flotation material and allow zero water to enter the unit and shall be 100% virgin grade linear low density polyethylene, black in color, with a nominal wall thickness of 0.150 inches and a minimum wall thickness of 0.125 inches. The encasement shall meet the ASTM 1998D-04 Falling Dart Test to assure the material quality and molding process. The encasement shall have the following minimum characteristics:
 - 1. Density per ASTM D-1505: 0.937 g/cc
 - 2. Tensile strength per ASTM D-638: 2750 psi
 - 3. Flexural modulus per ASTM D-790: 109,000 psi
- C. Polytub floatation material shall be 100% virgin grade polystyrene, expanded in-place inside the encasement, with a density of 1.0 to 1.75 pcf. Floatation material shall not sink or contaminate the water if the encasement is punctured. Material shall meet the Seven Day Hunt Absorption Test of less than 3.0 lbs per cubic foot water absorption in seven days per the test requirements.
- D. Units shall be secured to the structural frame as shown in these Plans. Each unit shall have a minimum of six molded mounting slots with 1.50-inch thick mounting flanges.
- E. The Polytub manufacturer shall furnish test results for each size furnished showing wall thickness, water absorption, falling dart test, and certified buoyancy rating. The manufacturer shall provide a minimum of 15 year warranty with the first 10 years non-prorated.

2.03 GRATING

- A. Grating used on floats shall be Fibergrate Ecograte®62 molded fiberglass grating, or approved equivalent, meeting the following requirements.
 - 1. Open area of grating shall be at least 60%. A sample shall be submitted for approval, if requested.
 - 2. Spacing between load bars shall meet ADA guidelines and be no larger than ½ inch.
 - 3. Grating shall have a coarse grit coating and be gray in color. Surface shall not have indications of delamination at end of warranty period.

2.04 HINGE CONNECTIONS

- A. Mainwalk hinge connections shall be located in the dock corners as shown in the Plans to provide a continuous open chaseway along entire dock centerline for installation of utilities.
- B. Finger hinge connections shall be continuous as shown in the plans.
- C. Hinge connections shall move freely, without binding, and shall be designed to resist all loads between docks, including torsion.

2.05 PILE HOOPS

- A. Pile Hoops shall be rigid structural elements, designed to accommodate water level fluctuations and ambient temperature. The hoops shall not permit the docks to bind during the full range of movement.
- B. The hoops shall be of steel and securely fastened to the frame by either a bolted or welded connection.
- C. The pile hoops shall have replaceable, beveled UHMW wear pads, sized as indicated in the plans, around the interior. UHMW polyethylene shall be manufactured from virgin polyethylene materials, shall be UV stabilized and shall be partially or fully cross linked. UHMW components shall be black in color, unless otherwise noted, and have countersunk, bolted connections.

2.06 PLASTIC RUBSTRIP

- A. Rubstrip edging shall be of UHMW or HDPE polyethylene, manufactured from virgin polyethylene material, shall be UV stabilized and shall be partially or fully cross-linked. Rubstrip components shall be black in color, unless otherwise noted, and have countersunk, bolted connections.
- B. Mounting shall accommodate thermal expansion and be thru-bolted as shown in the Plans.
- C. Rubstrip shall be continuous around the dock perimeter except at hinges and pile hoops.

2.07 CLEATS

- A. Cleats shall be the heavy duty, galvanized steel model in the sizes specified in the Plans.
- B. Cleats shall be securely fastened with galvanized hex head thru-bolts through the walers.

2.08 STAINLESS FASTENERS

- A. Stainless steel fasteners shall be 316 stainless steel, unless otherwise noted.
- B. Stainless washers shall be used under bolt head and nut and shall be 316 stainless steel
- C. All nuts used on stainless steel bolts shall be Nylock nut and shall be compatible with 316 stainless steel.

PART 3 EXECUTION

3.01 GENERAL

- A. Dock System shall be shop fabricated in an approved facility that provides a controlled environment suitable for manufacture of quality welded products. The shop shall provide adequate work space, equipment and protection from detrimental environmental conditions.
 - B. Welders shall be certified in accordance with AWS D1.1 for steel welding, and current qualifications shall be submitted for each welder.
 - C. The Contractor shall furnish the Engineer with 30 day notice of the beginning of the work at the shop so that special fabrication inspections may be scheduled by the Engineer.
- 3.02 FABRICATION
- A. The complete dock assembly shall be constructed as shown on the plans. Any materials damaged during transport and delivery and/or during handling and fabrication operations shall be repaired or replaced by the fabricator, at the discretion of the Engineer, and at no additional cost to the Owner.
 - B. Fabricate and assemble components in a shop, to greatest extent possible. Workmanship and finish shall be equal to the best industry standards and in accordance with the requirements of AWS and AISC, as applicable.
 - C. All steel welding shall be according to AWS D1.1, as applicable.
 - D. Fabrication: Edges shall be cut true, smooth and free of burrs. Flame cutting is not permitted. Corner edges shall be ground smooth. Holes shall be drilled or punched. Weld spatter and flash marks shall be removed and ground smooth. Mill stamps and markings shall be removed from all exposed surfaces.
 - E. All fabricated steel shall be galvanized per Section 05126 – Galvanizing or spray metalized per Section 05900 – Spray Metalized Coatings.
- 3.03 TRANSPORT AND DELIVERY
- A. The Contractor shall assume full responsibility for any damages or losses resulting from the handling or transport of the dock system during loading, shipping, transport and delivery to the project site as well as the subsequent handling required on site for installation.
 - B. Damage that occurs during transport and delivery and/or during other handling operations prior to final acceptance shall be repaired or replaced by the Contractor at the discretion of the Engineer and at no additional cost to the Owner
- 3.04 DOCK INSTALLATION COORDINATION
- A. The Contractor shall coordinate the fabrication of the dock system and the installation of the piles so that the completed system operates as intended. In the event the dock system does not function as intended, the Contractor shall make the necessary alterations to ensure proper function, at no additional cost to the Owner.
 - B. Docks may require ballasting, after installation, to account for any variations in dead load and distribution, after final assembly. Docks shall be furnished with sufficient extra freeboard and method for field ballasting to allow for floatation corrections to meet specifications.

- C. The Contractor shall take care in handling of docks to avoid damage during transport, storage, assembly, and installation. Storage of dock units shall be on level surfaces, and shall not be stacked, except as allowed by dock designer and manufacturer. The supplier shall use the appropriate dunnage to protect the docks while stored on site. Docks shall be protected against damage from any cause. Any damaged units shall be rejected and removed from the site, and replaced at no additional cost.
- D. Dock system shall be assembled such that all dock components, connections, pile hoops, gangways, transitions, deck surfaces, rubstrips, cleats, utilities and support structures and all other accoutrements necessary for a fully functioning dock system as shown in the Plans and described in the technical specifications are accounted for.

END OF SECTION

SECTION 05900
SPRAY METALIZED COATINGS

PART 1 GENERAL

1.01 DESCRIPTION

- A. The Work in this section shall include all labor, materials, tools and equipment necessary for surface preparation and application of all metal coatings, and all other miscellaneous associated work, in accordance with the requirements of the Contract Documents and as shown on the Plans. Steel components may be metalized, if not galvanized, as appropriate and approved by the Owner.

1.02 REFERENCES

- A. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
 - 1. SSPC CS-Guide No. 23 for Thermal Spray Metallic Coating.
 - 2. SSPC-SP 12 for power washing, pre cleaning
 - 3. SSPC-SP 10/NACE No. 2 for blast cleaning, near white metal finish
 - 4. SSPA-PA 2 for coating thickness measurement
 - 5. SSPC-PA 1 for seal coating

1.03 SUBMITTALS

- A. Product Data: Provide product data and/or technical specifications including manufacturer's instructions for surface preparation, required environmental conditions, etc., for all metal coating products.
- B. Coating Repair Methods and Materials: Contractor's proposed repair methods, procedures and materials for all metal coatings damaged as a result of shipping, handling, welding or by other means.
- C. Contractor shall submit a Quality Control Plan, per specification section 01400, for preparation and application of metal coatings for all project components specified to be coated. Quality Control Plan shall address solvent cleaning, blasting, surface profile standards, stripe coat and primer coat application, finish coat applications, coating thickness measurement and documentation, adhesion pull test procedures, independent inspection and documentation, as well as handling and transport methods.

PART 2 PRODUCTS

2.01 THERMAL METALLIC SPRAY

- A. Spray Metalizing – Materials specified for spray metalizing shall be spray metalized with pure zinc coating per SSPC Guide No. 23, Current Edition.

2.02 SEALANT

- A. Seal the spray metalized coating with PRO-LINE 4800/4801 PROTHANE H.S. as manufactured by SHERWIN WILLIAMS or approved equal. Sealant color shall be clear.

PART 3 EXECUTION

3.01 PREPARATION AND APPLICATION

- A. Cleaning and preparation for spray metalized coating:
 - 1. All vent, weep, rat holes in tubular structures shall be sealed closed prior to preparation and coating of surfaces.
 - 2. Prepare all surfaces to be spray metalized per SSPC CS-Guide 23, Current Edition. Surfaces to be spray metalized are indicated on the plans. Perform a power washing pre-cleaning in accordance with SSPC-SP 12 to remove loose paint, organic growth, dirt, grease, soluble salts and other contaminants. Prior to blast cleaning, surface imperfections such as sharp fins, sharp edges, weld spatter, etc. shall be removed from the surface. Following the power washing, blast clean the surfaces to be spray metalized to a near white metal finish in accordance with SSPC-SP 10/NACE No. 2. The steel substrate shall have a minimum angular profile depth of 2.5 mils.
 - 3. During cleaning and preparation, all paint, loose rust, organics, blast medium and other debris shall be contained for disposal in accordance with the contract requirements. Prior to application of the spray metalized coating, the steel substrate shall be heated to 250 degrees F to remove moisture from the steel. A minimum surface temperature shall be maintained during application of the spray metalized coating to prevent condensation of moisture on the substrate. Time between the completion of the final blasting and the completion of the thermal spraying should be no greater than six hours. If rust bloom, blistering or degraded coating appears at any time during the application of the coating system, repair the unsatisfactory portions per the specifications.
- B. Thermal Spray Metallic Coatings:
 - 1. Following cleaning and preparation, spray metalize the specified surfaces with a pure zinc coating per the SSPC CS-Guide 23, Current Edition. The coating shall have a minimum dry film thickness of 12 mils. The coating thickness shall be measured per SSPC-PA 2 with the following modification: no single measurement, including those that create a spot measurement, shall be less than 70% of the minimum required dry film thickness. The specified coating thickness shall be applied in several crossing passes laying down approximately 3 to 4 mils for each pass. The deposited coating system shall be uniform without blisters, cracks, loose particles, or exposed steel as examined with 10x magnification.
 - 2. The Contractor shall perform a minimum of one portable tension-bond measurements on each metalized surface/member.
 - 3. The Contractor shall perform a bend test at the beginning of each work shift or crew change:
 - a. Use carbon steel coupons of approximate dimension 2 in. x 4 in. x 8 in. x 0.05 in. thick.

- b. Surface preparation according to the contract specifications.
 - c. Bend coupons 180 degrees around a 0.5 in. diameter mandrel. Bend test passes if there is no cracking or only minor cracking with no spalling or lifting (by a knife blade) from the substrate. Bend test fails if the coating cracks with lifting (by a knife blade) from the substrate.
 - 4. Thermal spraying in low temperature environments, less than 40 degrees F shall comply with SSPC-CS 23 requirements.
 - C. Seal the spray metalized coating with specified sealant product. The seal coat shall be applied to 2 to 3 mils dry film thickness per manufacturer's recommendations and in conformance with SSPC-PA 1. The sealer should be applied as soon as possible after thermal spraying and preferably within eight hours.
 - D. The Contractor shall implement controls to protect air and water quality per Section 01570.
- 3.02 REPAIR OF DAMAGED COATINGS
- A. Coatings damaged due to fabrication, welding, material handling or occurring during installation shall be repaired by using the following hot-applied repair stick method in accordance with ASTM A780, per Section 05126, 3.02 for repair procedure.

END OF SECTION

SECTION 16050
GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Supporting devices for electrical components.
 - 2. Electrical identification.
 - 3. Electrical demolition.
 - 4. Cutting and patching for electrical construction.
 - 5. Touchup painting.

1.03 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquid-tight flexible metal conduit.
- E. RNC: Rigid nonmetallic conduit.

1.04 SUBMITTALS

- A. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- B. For each type of raceway, wire, splice kits, fittings, etc., indicated. Include clearly marked manufacturers technical data.

1.05 RECORD DRAWINGS

- A. Maintain continuously updated redline drawings during progress of the project. Show all changes from the contract documents. Provide detail dimensions for locations of conduit concealed by concrete or earthwork.

1.06 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

- B. Comply with NFPA 70.

1.07 COORDINATION

- A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in structure during progress of construction to facilitate the electrical installations that follow. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- B. Schedule required electrical outages at least 7 days in advance. Outages shall be scheduled after normal business hours of impacted facilities.
- C. Provide temporary power to the construction site. Coordinate requirements with all trades.
- D. Furnish support structures - scaffolding, rigging, floatation, etc.- necessary to complete the electrical installation. Remove structures upon completion of the project.

1.08 1.08 WARRANTY

- A. Contractor shall warrant entire system for a period of not less than one year. This warranty shall include all installed components under Division 16.

PART 2 PART 2 – PRODUCTS

2.01 SUPPORTING DEVICES

- A. For Use Outdoors: 316 stainless steel hardware. Galvanized steel and non-metallic components are not permitted for use as supporting hardware in areas overwater (piers, boardwalks, wharfs, floats, etc.).
- B. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- (14-mm-) diameter slotted holes at a maximum of 2 inches (50 mm) o.c., in webs.
- C. Concrete Anchors: Carbon-steel wedge or sleeve type not allowed. Use epoxy anchors see civil and structural specifications.
- D. Toggle Bolts: All-steel springhead type.

2.02 ELECTRICAL IDENTIFICATION

- A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
- B. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size. Label shall include source panel name and circuit number.
 - 1. Type: Preprinted, flexible, self-adhesive, vinyl. Legend is over-laminated with a clear, weather- and chemical-resistant coating.
 - 2. Color: Black letters on orange background.

- C. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick (25 mm wide by 0.08 mm thick).
- D. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 - 1. Not less than 6 inches wide by 4 mils thick (150 mm wide by 0.102 mm thick).
 - 2. Compounded for permanent direct-burial service.
 - 3. Embedded continuous metallic strip or core.
 - 4. Printed legend that indicates type of underground line.
- E. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background.
- F. Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm), galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch (6-mm) grommets in corners for mounting.
- G. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

PART 3 EXECUTION

3.01 ELECTRICAL EQUIPMENT INSTALLATION

- A. Materials and Components: Install level, plumb, and parallel and perpendicular to other structural systems and components, unless otherwise indicated.
- B. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- C. Right of Way: Give to raceways and piping systems installed at a required slope.

3.02 ELECTRICAL SUPPORTING DEVICE APPLICATION

- A. Wet and Damp Locations (including approach pier abutment, approach pier, gangway, and floats): stainless steel components.
- B. Dry Locations (uplands): Galvanized steel materials
- C. Selection of Supports: Comply with manufacturer's written instructions.
- D. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb (90-kg) design load.

3.03 SUPPORT INSTALLATION

- A. Install support devices to securely and permanently fasten and support electrical components.

3.04 IDENTIFICATION MATERIALS AND DEVICES

- A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment. Provide wire and cable identification labels for all feeders (and branch circuits) at all junction boxes and terminations.
- B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.

3.05 DEMOLITION

- A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality at no additional cost to owner.
- B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.
- C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches (50 mm) below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.
- D. Remove demolished material from Project site.
- E. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.06 FIELD QUALITY CONTROL

- A. Inspect installed components for damage and faulty work, including the following:
 - 1. Raceways.
 - 2. Wire and connectors.
 - 3. Supporting devices for electrical components.
 - 4. Electrical identification.
 - 5. Electrical demolition.
 - 6. Cutting and patching for electrical construction.
 - 7. Touchup painting.

3.07 REFINISHING AND TOUCHUP PAINTING

- A. Refinish and touch up paint.
 - 1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.

2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.08 CLEANING AND PROTECTION

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 16060
GROUNDING AND BONDING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes grounding of electrical systems and equipment. This section also applies to grounding electrode conductors (required for a separately derived system) for float mounted unit substations. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Data: For the following:
 - 1. Ground rods.
- C. Field Test Reports: Submit written test reports to include the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 1. Comply with UL 467.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2.02 GROUNDING CONDUCTORS, CABLES, CONNECTORS, AND RODS:

- A. Dossert Corp.
- B. Erico Inc.; Electrical Products Group.

- C. Framatome Connectors/Burndy Electrical.
 - D. Galvan Industries, Inc.
 - E. Harger Lightning Protection, Inc.
 - F. Hastings Fiber Glass Products, Inc.
 - G. Heary Brothers Lightning Protection Co.
 - H. Ideal Industries, Inc.
 - I. ILSCO.
 - J. Kearney/Cooper Power Systems.
 - K. Korns: C. C. Korns Co.; Division of Robroy Industries.
 - L. Lightning Master Corp.
 - M. Lyncole XIT Grounding.
 - N. O-Z/Gedney Co.; a business of the EGS Electrical Group.
 - O. Racor, Inc.; Division of Hubbell.
 - P. Robbins Lightning, Inc.
 - Q. Salisbury: W. H. Salisbury & Co.
 - R. Superior Grounding Systems, Inc.
 - S. Thomas & Betts, Electrical.
- 2.03 GROUNDING CONDUCTORS
- A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."
 - B. Equipment Grounding Conductors: Insulated with green-colored insulation.
 - C. Grounding Electrode Conductors: Type G cable.
 - D. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.
 - E. Bare Copper Conductors: Comply with the following:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Assembly of Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - F. Copper Bonding Conductors: As follows:
 - 1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch (6.4 mm) in diameter.

2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.
4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.

2.04 CONNECTOR PRODUCTS

- A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
- B. Connectors: compression type.
- C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.05 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel.
 1. Size: 3/4 by 120 inches (19 by 3000 mm) in diameter.
- B. Test Wells: Provide precast 10" diameter open bottom concrete handholes with removable steel cover. Cover shall be stamped 'GROUND'. Product shall be manufactured by company regularly engaged in the manufacturing of underground electrical vaults and handholes.

PART 3 EXECUTION

3.01 APPLICATION

- A. In raceways, use insulated equipment grounding conductors.
- B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.
- C. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.
- D. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.

3.02 EQUIPMENT GROUNDING CONDUCTORS

- A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
- B. Install equipment grounding conductors in all feeders and circuits.
- C. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
- D. Metal Poles Supporting Outdoor Lighting Fixtures: Provide a grounding electrode in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.

3.03 INSTALLATION

- A. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.
 - 1. Drive ground rods until tops are 2 inches (50 mm) below finished or final grade, unless otherwise indicated.
 - 2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging copper coating.
- B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.
- D. Install one test well for each approach pier at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade.

3.04 CONNECTIONS

- A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- C. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and ground rods.

- D. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
- E. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

3.05 FIELD QUALITY CONTROL

- A. Testing: Perform the following field quality-control testing:
 - 1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
 - 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.
 - 3. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
 - a. Equipment Rated 500 kVA and Less: 10 ohms.
 - b. Equipment Rated 500 to 1000 kVA: 5 ohms.
 - 4. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 16120
CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.02 CONDUCTORS AND CABLES

- A. Manufacturers:
 - 1. American Insulated Wire Corp.; a Leviton Company.
 - 2. General Cable Corporation.
 - 3. Southwire Company.
- B. Conductor Material: Copper complying with NEMA WC 5 or 7; solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.
- C. Conductor Insulation Types: Type XHHW complying with NEMA WC 5 or 7; Type G, extra hard duty, UV resistant.

2.03 CONNECTORS AND SPLICES

- A. Available Manufacturers:
 - 1. Hubbell/Anderson.
 - 2. O-Z/Gedney; EGS Electrical Group LLC.
 - 3. 3M Company; Electrical Products Division.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated. Splices shall be epoxy resin encapsulated or gel type - no exceptions. Splice kits shall be UL listed for the application.

PART 3 EXECUTION

3.01 CONDUCTOR AND INSULATION APPLICATIONS

- A. Service Entrance: Type XHHW, single conductors in raceway.
- B. Exposed Feeders (uplands): Type XHHW single conductors in raceway.
- C. Underground Feeders and Branch Circuits (uplands): Type XHHW, single conductors in raceway for feeders; Type THHN-THWN, single conductors in raceway for circuits using smaller than #10 awg.
- D. Upland distribution panels to, and on, floating docks - #6 awg and larger: Type G, extra hard duty, UV resistant. Protect from physical damage.
- E. Floating dock branch circuits #8 awg and smaller: Type SOW, extra hard duty, UV resistant. Protect from physical damage.

3.02 INSTALLATION

- A. Conceal cables in chases and conduit sleeves provided for this purpose. Cables shall be installed in chases, or below floats, as allowed by NFPA 70 and local authority having jurisdiction.
- B. Prior to installation of conductors ensure all of chases are smooth and free of sharp edges and debris. Contractor shall smooth and round edges of electrical and communication chases in floats, including but not limited to, chases between float modules, entering junction boxes, and those stubbed to the outside of the float.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

3.03 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.
- 3.04 FIELD QUALITY CONTROL
- A. Testing: Perform the following field quality-control testing:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
 - 2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

END OF SECTION

SECTION 16130
RACEWAYS AND BOXES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. Related Sections include the following:
 - 1. Division 26 Section "General Electrical Requirements" for supports, anchors, and identification products.

1.03 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquidtight flexible metal conduit.
- E. LFNC: Liquidtight flexible nonmetallic conduit.
- F. RNC: Rigid nonmetallic conduit.

1.04 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.02 METAL CONDUIT AND TUBING

A. Available Manufacturers:

1. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
2. LTV Steel Tubular Products Company.
3. O-Z Gedney; Unit of General Signal.

B. Rigid Steel Conduit: ANSI C80.1.

C. Plastic-Coated Steel Conduit and Fittings: NEMA RN 1.

D. Plastic-Coated IMC and Fittings: NEMA RN 1.

E. EMT and Fittings: ANSI C80.3.

1. Fittings: Compression type.

F. FMC: Zinc-coated steel.

G. LFMC: Flexible steel conduit with PVC jacket.

H. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.03 NONMETALLIC CONDUIT AND TUBING

A. Available Manufacturers:

1. American International.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corp.
4. Cantex Inc.
5. Certainteed Corp.; Pipe & Plastics Group.
6. Condux International.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; Division of Hubbell, Inc.
12. Spiralduct, Inc./AFC Cable Systems, Inc.
13. Thomas & Betts Corporation.

- B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.
- C. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.
- D. LFNC: UL 1660.

2.04 2.04 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers:
 - 1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
 - 2. Emerson/General Signal; Appleton Electric Company.
 - 3. Hoffman.
 - 4. Hubbell, Inc.; Killark Electric Manufacturing Co.
 - 5. O-Z/Gedney; Unit of General Signal.
 - 6. Skyline Electric Co., Seattle, WA.
- B. Non-metallic Outlet and Device Boxes: NEMA 4, suitable for marine environments.
- C. Sheet Metal Outlet and Device Boxes: not allowed.
- D. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
- E. Hinged-Cover Enclosures: NEMA 250, type 4X, with hinge cover and flush latch.
 - 1. Metal Enclosures: Powder coated stainless steel, finished inside and out, unless noted or specified otherwise.

2.05 2.05 FACTORY FINISHES

- A. Finish: For raceway, enclosures, or cabinet components, provide manufacturer's marine white paint applied to factory-assembled enclosures and cabinets before shipping.

PART 3 EXECUTION

3.01 3.01 RACEWAY APPLICATION

- A. Outdoors:
 - 1. Exposed: Rigid steel.
 - 2. Concealed: Rigid steel or IMC.
 - 3. Underground, Single Run: RNC.
 - 4. Underground, Grouped: RNC.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 6. Boxes and Enclosures: NEMA 250, Type 4X.
- B. Minimum Raceway Size: 3/4-inch trade size (DN 21).

3.02 INSTALLATION

- A. Keep raceways at least 6 inches (150 mm) away from parallel runs of water pipes. Install horizontal raceway runs above water piping.
- B. Complete raceway installation before starting conductor installation.
- C. Support raceways as specified in Division 16 Section "Basic Electrical Materials and Methods."
- D. Install temporary closures to prevent foreign matter from entering raceways.
- E. Protect stub-ups from damage where conduits extend beyond concrete slabs. Arrange so curved portions of bends are not visible above the finished slab.
- F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
- G. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.
 - 1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
 - 2. Space raceways laterally to prevent voids in concrete.
 - 3. Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
- H. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
- I. Stub-up Connections: Extend conduits through concrete slab for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished slab. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the slab. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

3.03 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.04 CLEANING

- A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION

SECTION 16442
PANELBOARDS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. This Section includes panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less

1.02 RELATED SECTIONS

- A. 16050 – Basic Electrical Materials and Methods

1.03 REFERENCES

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.04 SUBMITTALS

- A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

- B. Shop Drawings: For each panelboard and related equipment.

- 1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
 - i. Enclosure types and details.
 - ii. Bus configuration, current, and voltage ratings.
 - iii. Short-circuit current rating of panelboards and overcurrent protective devices.
 - iv. UL listing of installed devices.
 - v. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
- 2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.

- C. Field Test Reports: Submit written test reports and include the following:

- 1. Test procedures used.
- 2. Test results that comply with requirements.
- 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

- D. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.
- E. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 1.

1.05 DEFINITIONS

- A. GFCI: Ground-fault circuit interrupter.
- B. RMS: Root mean square.

1.06 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

1.07 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

1.08 EXTRA MATERIALS

- A. Keys: Six spares of each type of panelboard cabinet lock. Key to match existing panels.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
 - i. Eaton Corp.; Cutler-Hammer Products.
 - ii. General Electric Co.; Electrical Distribution & Control Div.
 - iii. Siemens Energy & Automation, Inc.
 - iv. Square D Co.

2.02 FABRICATION AND FEATURES

- A. Enclosures: NEMA 4X.
- B. Front: For surface-mounted fronts, match box dimensions.

- C. Finish: 316 stainless steel, or, powder coated 304L stainless steel (gray indoors; white outdoors).
- D. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.
- E. Bus: Hard-drawn copper, 98 percent conductivity
- F. Main and Neutral Lugs: Mechanical type suitable for use with conductor material.
- G. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
- H. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

2.03 PANELBOARD SHORT-CIRCUIT RATING

- A. Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.04 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

2.05 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Mounting: Plumb and rigid without distortion of box.
- C. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- D. Install filler plates in unused spaces.
- E. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

3.02 IDENTIFICATION

- A. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant stainless steel screws.

3.03 CONNECTIONS

- A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.
- B. Tighten electrical connectors and terminals per manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.04 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:
 - 1. Test continuity of each circuit.

3.05 CLEANING

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION

SECTION 16445
MARINE POWER PEDESTALS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. General provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes power pedestals, including integral power receptacles and digital electrical metering.

1.03 SUBMITTALS

- A. Product Data: For each type of power pedestal configuration. Include dimensions and manufacturers technical data on features. Provide electrical characteristics, ratings, and finishes.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Fabrication drawings showing complete assembly.
 - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 - 3. Bill of materials.
 - 4. Nameplate legends.
 - 5. Ratings of individual protective devices.
 - 6. Dimensioned plans and elevations for pedestal stand.

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 70.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Power Center/Enclosure/Mounting Post assembly:
 - a. Eaton Lighthouse SS, by Eaton
 - 2. Metering:
 - a. Integrated Metering Systems, Inc., Tampa Bay, Florida.

2.02 POWER PEDESTAL

- A. The power pedestal assembly shall comply with the following:
1. Power Center Housing: 316L stainless steel. Overall height nominal 40".
 2. Wiring: The assembly shall be completely pre-wired at the factory to the load side of the compression lugs (located in the mounting post). Copper shall be of high stranding. Pedestals shall be double lugged w/250-amp, 4-pole, barrel type mechanical lugs. Lugs shall be suitable for terminating fine strand wire.
 3. Grounding: All exposed metallic parts must have an integral ground that is a part of the equipment grounding system. Provide ground connections per NEC.
 4. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Breakers shall be GFCI rated (30ma maximum), UL listed, and rated for 10k AIC.
 5. Receptacles:
 - a. All receptacles shall be Hubbell corrosion resistant type conforming to NEMA requirements.
 - b. Receptacles shall be equipped with a lockable hinged door that is under tension to close when the receptacle is not in use.
 - c. Receptacles shall be a locking grounding type, (1) 125 volt, 30 amp, per NEC requirements.
 - d. Provide receptacles with threaded locking rings and locking receptacle covers. Provide with stainless locking tabs and tamper resistant fasteners.
 6. Telephone/Data Devices: None.
 7. Metering: The pedestals shall be equipped with fully electronic meters that display kilowatts used at each slip on a non-resetting digital counter that is protected from the weather (but readable from the outside). The accuracy of the meters must be certified by the manufacturer to have a 100 ampere rating and no more than a 1% error when tested in accordance with ANSI C12.1. Provide meter with remote read feature (isolated output).
 8. Labels: Provide pedestal housing with (2) phenolic labels secured with stainless steel fasteners. Nameplate shall be engraved as directed by the owner. Each label will be unique to the slip served.
 9. Water: Provide (2) ¾" hose bibs – see other sections for hose bib requirements.
 10. Hardware: Mounting hardware, including screws, bolts, nuts, washers, etc, shall be stainless steel.
 11. UL Listing: The entire assembly shall be UL listed.
 12. Warranty: The manufacturer of the power pedestal shall warrant the power pedestal, and components, for a period of 3 years from the date of installation.

13. Light fixture: pedestal shall be equipped with an integral 14-watt LED luminaire (or equivalent lumen output) with clear lens(es). Provide power center with photocell control for internal 120-volt, light circuit.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Installation per manufacturer's written instructions.
- B. Pedestal Attachment: Bolt pedestals to dock structure in locations shown on drawings. Bolts, nuts, and washers, shall be stainless steel (diameter as recommended by manufacturer).

3.02 FIELD QUALITY CONTROL

- A. Inspect each installed unit for damage. Replace damaged units.
- B. Defective or Malfunctioning Components: Replace or repair, then retest. Repeat procedure until units operate properly.
- C. Test outlets for proper phase, neutral, and ground connections. Correct as necessary.

END OF SECTION

SECTION 16521
EXTERIOR LIGHTING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes exterior lighting units with luminaires, lamps, ballasts/drivers, and accessories.

1.03 DEFINITIONS

- A. Lighting Unit: A luminaire or an assembly of luminaires complete with a common support, including pole, post, or other structure, and mounting and support accessories.
- B. Luminaire (Light Fixture): A complete lighting device consisting of lamp(s) and ballast(s), when applicable, together with parts designed to distribute light, to position and protect lamps, and to connect lamps to power supply.

1.04 SUBMITTALS

- A. Product Data: For each type of lighting unit indicated.
- B. Shop Drawings: Anchor bolt template coordinated with float manufacturers shop drawings.

1.05 QUALITY ASSURANCE

- A. Luminaires and Accessories: Listed and labeled as defined in NFPA 70, Article 100, and marked for their indicated use, location, and installation conditions by a testing agency acceptable to authorities having jurisdiction
- B. Comply with ANSI C2.
- C. Comply with NFPA 70.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. See specified luminaires (on drawings).

2.02 LUMINAIRES

- A. Components: Corrosion-resistant aluminum.
- B. Housings: Provide filter/breather for enclosed luminaires.

- C. Doors, Frames, and Other Internal Access: Arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position. Arrange to disconnect ballast when door opens.
- D. Exposed Hardware Material: Stainless steel.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Installation per manufacturer's written instructions.
- B. Luminaire Attachment: Fasten to structural supports. Install in locations shown on drawings.
- C. Provide and install lamps in luminaires per manufacturer's written instructions.

3.02 GROUNDING

- A. Ground metal support structures.

3.03 FIELD QUALITY CONTROL

- A. Inspect each installed unit for damage. Replace damaged units.
- B. Tests and Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source. Check visually uniformity of illumination.
- C. Prepare a written report of tests, inspections, observations and verifications indicating results compared with specified requirements, and provide resolution of differences if values do not agree.
- D. Defective or Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

END OF SECTION