

### **READ THIS FIRST**

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [ ] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [ “ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Shift) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

This specification is ONLY used if there is a commissioning agent for the project. If there is not, but commissioning is still required, use 00 91 00.13 for Contractor Commissioning requirements.

## **PART 1 GENERAL**

### **1.01 SUMMARY**

- A. The intent of Commissioning is to verify systems and equipment are being delivered to the Port fully functioning in accordance with project documents and for which the Port’s personnel are fully trained and equipped to operate, maintain and troubleshoot. Additionally, the Port shall have supporting documentation to enable Port staff to maintain systems and equipment in accordance with manufacturer’s recommendations and the Port’s intent to sustain operations over the life of the system or equipment.
- B. Commissioning services will be provided by the Port hired commissioning agent. Contractor shall perform related work as specified to assist Port personnel in the commissioning process.

### **1.02 TERMS AND DEFINITIONS**

- A. Commissioning: The process certifying that mechanical, electrical, communications, control, and life safety systems equipment, subsystems or systems, function together properly to meet performance requirements and design intent as shown in a composite manner in the Contract Documents.
- B. Commissioning Authority: The person or persons contracted by the Port to direct the commissioning process through appropriate contract channels and recommend project completion from the commissioning perspective.

- C. Systems: Group of components and equipment functioning as a unit or performing a common function. (IE: Chilled Water System: consisting of piping, valves, fittings, controls, chillers, expansion tanks, air relief, chemical treatment, pumps, etc.)
- D. Functional Testing: That full range of checks and tests carried out to determine if all components, sub-systems, systems, and interfaces between systems function in accordance with the contract documents. In this context, “function” includes all modes and sequences of control operation, all interlocks and conditional control responses, and all specified responses to abnormal emergency conditions.
- E. Acceptable Performance: A component or system shall meet specified design parameters and criteria under actual load conditions for duration of time as indicated within the functional test criteria as determined by technical specifications and manufacturer’s literature.
- F. Areas of Conflict: Where 01 91 00 - Commissioning specifications or requirements conflict with Technical Specifications or other requirements, the Technical Specification requirements shall take precedence.

#### **1.03 COMMISSIONING TEAM**

- A. The commissioning team shall consist of the Port’s representatives, Commissioning Agent, Contractor, Adjusting and Balancing Engineer, and other Subcontractors, Manufacturers, and the Project Designers in accordance with their contractual arrangements with the Port. The Port’s operating staff will be included during specific elements of the commissioning process. It is the intent that all members work together as a team to fulfill their contractual responsibilities and meet the objectives of the Contract Documents and make the project turnover and commissioning process seamless.

#### **1.04 CONTRACTOR**

- A. The Contractor shall execute the testing procedures in accordance with the commissioning plan.
- B. A Contractor’s representative shall be present during all commissioning activities performed by itself or one of its Subcontractors.
- C. The Contractor shall schedule and execute the commissioning plan to the satisfaction of the Commissioning Authority.

#### **1.05 DUTIES OF THE CONTRACTOR**

- A. Execute the commissioning plan through the operation of equipment and systems by their subcontractors.
- B. Shall be solely responsible for the operations, testing, and results during the commissioning process for systems and equipment to perform in accordance with the contract documents.
- C. Notify the Engineer in writing that equipment and systems are ready for commissioning.
- D. Include within the master schedule, commissioning activities and durations.

- E. Professionally maintain shop drawings, as-built drawings and system single-line schematics and diagrams for all systems that are installed and are to be included in the O&M manuals and used during the commissioning process and training per Section 01 78 29 - As Built Redline Documents.

**1.06 TESTING, ADJUSTING, AND BALANCING ENGINEER (TAB)**

- A. The accepted TAB Engineer/Firm shall be qualified and perform Work in accordance with Section 23 05 93 - Testing, Adjusting and Balancing.
- B. TAB Firm shall communicate through the Contractor to the Engineer.

**1.07 COMMISSIONING PHASING AND SEQUENCING**

- A. The Contractor shall coordinate all phasing and/or sequencing requirements to integrate the commissioning plan activities and durations within the master schedule.

**1.08 ACCEPTANCE PROCEDURES**

- A. The Contractor shall execute the commissioning plan and verify all commissioning activities have been completed and all activities have successfully met or exceeded the established acceptance criteria.
- B. The Contractor shall provide all acceptance test results and documentation to the Engineer for review and acceptance.

**PART 2 PRODUCTS - Not Used**

**PART 3 EXECUTION**

**3.01 GENERAL**

- A. Contractor shall operate equipment and systems, and conduct all tests in presence of the Engineer and/or a designated Port Representative(s) to demonstrate compliance with technical specifications.
  - 1. Testing shall be conducted under design operating conditions as defined within the specifications and in the commissioning plan and approved by the Engineer.
- B. All elements of systems shall be tested to demonstrate that total systems satisfy all requirements of the technical specifications. Testing shall be accomplished on hierarchical basis. Each piece of equipment will be tested for proper operation, followed by each subsystem, followed by entire system, followed by interfaces to other major systems.
- C. Contractor or their subcontractor shall provide all special testing materials and test equipment.

**3.02 PRE-COMMISSIONING WORK**

- A. Attend a commissioning scoping meeting and other meetings necessary to facilitate the commissioning process. One representative of the Contractor cognizant of respective aspects of their work shall attend commissioning meetings. Other trades shall attend the commissioning meetings when their portions of the work are being tested. The Engineer will administer the meetings. Meeting location will be determined.

- B. Normal start-up services required to bring system into a fully operational state. This includes cleaning, filling, purging, leak testing, motor rotation check, control sequences of operation, full and part load performance, and similar conditions.
- C. Completion of controls installation, calibration, programming, and testing is critical for efficient and successful commissioning process.

### 3.03 PARTICIPATION IN COMMISSIONING

#### A. DESCRIPTION

- 1. Start up and test of systems shall be by skilled technicians. Make these same technicians available to assist Port personnel in completing the commissioning process as it relates to each system and their technical specialty.
  - 2. Coordinate work schedules, time required for commissioning, and similar conditions with the Port. Ensure qualified technicians are available and present during agreed upon schedules and for sufficient duration to complete necessary tests, adjustments, and problem resolutions.
- B. System Issues and Discrepancies: Additional technician time and Port personnel time may be required to resolve issues and discrepancies. Make additional technician time available for subsequent commissioning periods until required system performance is obtained.
- 1. Complete corrective work to permit completion of commissioning process.
  - 2. If deadlines pass without resolution of the problems, the Port reserves the right to obtain supplementary services and equipment to resolve problems. Costs incurred to solve problems in an expeditious manner will be the Contractor's responsibility.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 GENERAL

- A. No separate measurement or payment will be made for the Work required in this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices][Lump Sum price] bid for the project.

End of Section
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