

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 (Tab) 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.

O&M Data requirements are part of the commissioning specification from the perspective of quality and adequacy of project closeout documentation. Coordinate this Section with 01 91 00 – Commissioning or 01 91 00.13 – Commissioning Activities, 01 79 00 –Training, and other Technical Specifications. Review with Engineer, Project Manager, Maintenance, Facilities and other Stakeholders to tailor this section to the needs and requirements of the specific project.

PART 1 GENERAL

1.01 SUMMARY

- A. This section identifies the requirements for posting operating instructions and the format and general content requirements for the compilation of all operation and maintenance documentation for this project. Additional special O&M documentation requirements may exist in other divisions and sections of the specification.

1.02 POSTING OF CONDENSED OPERATING INSTRUCTIONS:

- A. Condensed instructions shall be clearly laminated and secured adjacent to or inside the equipment where they can be easily read by operating personnel performing the steps listed. The writing shall not fade in sunlight and shall be secured to prevent easy removal, peeling and degradation if exposed to the weather.

1.03 OPERATING AND MAINTENANCE MANUALS

- A. Computerized Maintenance Management System (CMMS) Input Form shall be completed by the Contractor and submitted for approval [at least sixty (60) days prior to Substantial Completion] [with the draft O&M submittal].
- B. Quantity: One electronic and two hard copies of the draft and final manuals addressing all work within this project.

1. The electronic data shall have software search features and interactive capabilities, format, and index shall be defined by the Contractor and approved by the Engineer.
 - a. Provide electronic O&M in Microsoft Office or Adobe PDF format.
 - b. PDF versions originating from scanned documentation shall be generated from legible documents, formatted and fully text searchable.
- C. Draft manuals: Contractor shall submit draft manuals at least [sixty (60)] calendar days prior to Substantial Completion. The Engineer shall review with Commissioning Agent, Design Team or Owner and return the draft submittals to the Contractor in accordance with Section 01 33 00 - Submittals.
- D. Final manuals, incorporating all comments made, Contractor shall submit a final electronic draft to the Engineer [seven (7)] calendar days prior to the scheduled project Final Inspection. Port will respond with acceptance or revision requests within fifteen (15) days. Upon acceptance of the final manuals by the the Engineer after review with Commissioning Agent or Port stakeholders, the Contractor shall resubmit two hard copy O&M manuals and one electronic copy incorporating all required changes prior to Final Inspection. If changes are required to final manuals, the Contractor shall provide copies of the revision for each hard copy (if sheets within a bound manual or portion thereof are updated replace full bound copy) and one revised full electronic O&M manual. All changes shall be submitted with a narrative identifying all changes. Contractor is responsible for obtaining written releases dealing with copyright restrictions.
- E. Binders shall be 8 1/2" x 11" loose-leaf, clearly labeled on the spine. Maximum 3-inch binders; do not overload binders. O&M library shall consist of a series of three-D-ring binders. Covers shall be hard durable materials with cleanable plastic covers, and metal lockable hinge.
- F. Covers: label with project number, name of project, Port of Seattle, Designer, Prime Contractor and the year project completed. The binder spine shall be labeled with the project number, name of project and the specification sections contained within the binder.

1.04 FORMAT OF MANUALS

- A. Each document shall contain a title page and table of contents provide a main tab for the Computerized Maintenance Management System (CMMS) Input Form; Safety Data Sheets (SDSs); and, each specification section.
 1. Computerized Maintenance Management System (CMMS) Section: In addition to a hard copy for the manuals, the CMMS input form shall be a live electronic Excel spreadsheet provided by the Engineer to the Contractor.
 - a. PDF or other format is not acceptable for this document.
 - b. Include information in Manual groups as defined below.
 2. Safety Data Sheets – Provide a complete set. Information should be presented with summary including a cross reference to specification and equipment identification numbers.
 - a. Include information in Manual groups as defined below.

3. Specification Sections: Behind the section number tab, there shall be the equipment ID tag and sub-tab for each piece of major equipment (or group, if small or numerous) within the specification. These sub-tabs shall be similar to the specification number tabs but a different color. Behind each equipment name tab shall be the following sections, in the given order, divided by a double weight colored sheet labeled with the typed title of the section:
 - a. Contact Information: The name, address and telephone number of the manufacturer and installing contractor and the 24-hour number for emergency service for all equipment in this section, identified by equipment. Emergency numbers and System/Equipment identification shall be typed in bold for ease of emergency identification, and the completed Computerized Maintenance Management System (CMMS) input form will be included.
 - b. Submittal and Product Data: All approved submittal data, cut sheets and appropriate shop drawings. If submittal was not required for approval, descriptive product data shall be included. A copy of the start-up report will be included. Eliminate advertisement documentation and other data that does not specifically relate to this project system or equipment.
 - c. Preventative Maintenance Instructions
 - (1) This section shall include condensed typed excerpts from the manufacturer’s “best practice” written instructions for regular or periodic maintenance prepared by the equipment manufacturer or supplier for all systems, equipment, or items listed within the specification, with recommended break-down inspections, replacement parts, and servicing.
 - (2) This section shall include condensed instructions for start-up, shut-down, emergency operation, safety precautions, unusual features, troubleshooting suggestions and wiring and control diagrams. Where control sequences are clearly covered in controls section of the O&M manuals, it is not to be duplicated here. These instructions shall be provided for each major piece of equipment identified within the technical specifications.

B. Information Compilation

1. Manual Group I - Building Structural, Exterior and Interior Materials and Systems Operations and Maintenance Instructions :
 - a. Includes all building material and finishes. State specific identifying information, lot numbers, local distributors and suppliers with their company names, addresses, and phones numbers. List installing contractors or vendors with their company names, addresses, and phones numbers. Manual shall contain all information needed to identify, maintain, and replace/duplicate any finish materials, equipment or features installed in this project, presented and arranged in a logical manner, indexed and tabbed in accordance with the respective specification sections, for efficient use by the

Port's personnel. The information provided shall include, but not limited to, the following:

- (1) Material, piece of equipment, or finish designation.
- (2) Manufacturer's name, model number, make, size, local vendor and supplier.
- (3) Proportions of mixes.
- (4) Color formula list for each paint color used.
- (5) Finish numbers or designations.
- (6) Cleaning, safety, and manufacturer's "best practice" operational and maintenance instructions including all requirements for personal protective equipment.
- (7) Local subcontractor and supplier's name, address, phone number, and reference order number.
- (8) State and local permits associated with the work.
- (9) All first time pressure vessel permits
- (10) All water backflow-preventer inspection reports and certifications
- (11) All procedures and test results on domestic water pipe pressurization and sanitizing
- (12) Equipment operating parts list and reorder information.
- (13) Equipment shop repair manual.
- (14) Recommended spare parts inventory.
- (15) All warranties required by the general and technical specifications, placed in appropriate specification section division.
- (16) Electronic copies shall be software acceptable to the Engineer.

2. Manual Group II - Equipment and Mechanical Operation and Maintenance Instructions:

a. These shall be the written manufacturer's data with the model and features of this installation clearly marked and edited to omit reference to products or data not applicable to this installation. This section shall include manufacture and design data on the following:

- (1) Equipment and/or system photo as installed within this project with description and design intent.
- (2) Cleaning, safety, and manufacturer's "best practice" operational and maintenance instructions
- (3) Completed pre-commissioning and pre-functional checklists with all data and documentation.
- (4) State and local permits associated with the work.

- (5) All first time pressure vessel permits
- (6) All water backflow-preventer inspection reports and certifications
- (7) All procedures and test results on domestic water pipe pressurization and sanitizing
- (8) Completed functional test results.
- (9) Elevator, escalator, conveyance and other equipment documentation and manuals that requires special outside agency permits.
- (10) For HVAC systems, final air & water testing, adjusting, and balancing (TAB) report.
- (11) All starting, normal shutdown, emergency shutdown, manual operation, seasonal changeover and normal operating procedures and data, including any special limitations.
- (12) Copy of posted condensed operating instructions.
- (13) O&M and installation instructions that were shipped with the unit.
- (14) Required operator certifications to safely operate equipment or systems
- (15) Safety issues with operating, maintaining and servicing equipment such as noise, fumes, gases such as Freon or FS-6, Asbestos Containing Material (ACM) or other regulated material, including all requirements for personal protective equipment.
- (16) Annual breakdown service procedures and schedules.
- (17) Troubleshooting procedures and guide.
- (18) Specific manufacturer's breakdown shop repair manual.
- (19) Parts list, edited to omit reference to items that do not apply to this installation, including local sources of supply.
- (20) Manufacturer recommended spare parts for servicing and maintaining equipment and local source of supply. Provide warehouse lead-time for delivery.
- (21) List of specialty tools required to service or maintain equipment and local source of supply.
- (22) Equipment performance data, ratings and curves. If the equipment includes a pump or fan, the appropriate pump or fan curve upon which the equipment was selected as well as the impeller or volute selection installed. If the curve was generated specifically for the project using a computer program selection, include along with the curve a reference to the program and it's revision status.

- (23) Warranty that clearly lists conditions to be maintained to keep warranty in effect.
 - (a) Contractor/Labor warranty (including phone numbers)
 - (b) Part/system/equipment specific warranties (including complete list of components)
 - (c) Specifically what is NOT covered by warranty
- (24) Single-line system/equipment diagrams/shop drawings
- (25) Electronic software and imprinted copy ladder logic. Editing software and documentation shall be executed on maintenance hardware (laptops).
- (26) Service contracts issued or/extended warranty

If DDC Control System associated with project include the next section:

- (27) Controls Operations and Maintenance Manual shall contain:
 - (a) As-built set of control drawings (refer to Submittal section above for details).
 - (b) As-built sequence of operations for each piece of equipment.
 - (c) Points list and all their attributes.
 - (d) Color print screens of geographic layout of equipment/system software.
 - (e) Valve schedule.
 - (f) Schedules and set points after testing and acceptance of the system.
 - (g) Two electronic copies on CD of the entire program for the facility.
 - (h) Maintenance instructions, including calibration requirements and methods by type.
 - (i) Control equipment component submittals, and parts lists.
 - (j) Copies of all checkout tests and calibrations performed by the Contractor or manufacturer (not commissioning tests).
 - (k) Drawings for each piece of equipment and components, including the sequence of operation.
 - (l) Specifications: The component or system specification section copied and inserted complete with all addenda.

3. Manual Group III – Electrical and Communication Operation and Maintenance Instructions:
 - a. These shall be the written manufacturer’s data with the model and features of this installation clearly marked and edited to omit reference to products or data not applicable to this installation. This section shall include manufacture and design data on the following:
 - (1) Equipment and/or system photo as installed within this project with description and design intent.
 - (2) Cleaning, safety, and manufacturer’s “best practice” operational and maintenance instructions
 - (3) Completed pre-commissioning and pre-functional checklists with all data and documentation.
 - (4) Completed functional test and equipment calibration results.
 - (5) Short circuit study results.
 - (6) Variable Frequency Drive and non-linear electric load test reports as required in Division 15.
 - (7) Settings of breakers, relays, timers, electric equipment thermostats, and any other field control devices.
 - (8) Software and firmware necessary to configure any electrical equipment.
 - (9) State and local permits associated with the work.
 - (10) All starting, normal shutdown, emergency shutdown, manual operation, seasonal changeover and normal operating procedures, settings, and data, including any special limitations.
 - (11) Copy of posted condensed operating instructions.
 - (12) O&M and installation instructions that were shipped with the unit.
 - (13) A list of required operator certifications to safely operate equipment or systems
 - (14) Safety issues with operating, maintaining and servicing equipment such as noise, fumes, gases such as Freon or FS-6, Asbestos Containing Material (ACM) or other regulated material, including all requirements for personal protective equipment.
 - (15) Annual breakdown service procedures and schedules.
 - (16) Troubleshooting procedures and guide.
 - (17) Specific manufacturer’s breakdown shop repair manual.
 - (18) Parts list, edited to omit reference to items that do not apply to this installation, including local sources of supply.

- (19) Manufacturer recommended spare parts for servicing and maintaining equipment and local source of supply. Provide warehouse lead-time for delivery.
- (20) List of specialty tools required to service or maintain equipment and local source of supply.
- (21) Equipment performance data, ratings and curves.
- (22) Warranty that clearly lists conditions to be maintained to keep warranty in effect.
 - (a) Contractor/Labor warranty (including phone numbers)
 - (b) Part/system/equipment specific warranties (including complete list of components)
 - (c) Specifically what is NOT covered
- (23) Single-line system/equipment diagrams/shop drawings. Two electronic copies on CD of the entire program for the facility.
- (24) Equipment, panel, & board schedules
- (25) Logic diagrams. If PLC or other special programming required, provide editing software and documentation to be executed on maintenance hardware (laptops).
- (26) Safety Data Sheets (SDSs)
- (27) Service contracts issued or/extended warranty

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

- A. No separate measurement or payment will be made for the work required by 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