

~~~~~ **PROJECT NOTE** ~~~~~

AOR/EOR IS RESPONSIBLE FOR REVIEWING THIS SPECIFICATION SECTION IN DETAIL FOR COORDINATION WITH THE PROJECT SCOPE OF WORK.

ALL "PROJECT NOTE" TEXT IS TO BE REMOVED FOLLOWING REVIEW OF THE CONTENT OF EACH NOTE BY THE AOR/EOR.

EDIT THE DOCUMENT FOOTER TO INCLUDE THE PROJECT NAME AND NUMBER.

EDIT THE DOCUMENT HEADER TO INDICATE THE "AOR PROJECT ISSUE" DATE. THE "CPS CONTROL" DATE SHOULD NOT BE EDITED.

ALL DIVISION 00 AND DIVISION 01 SECTIONS ARE TO BE REVIEWED BY THE DESIGN MANAGER/CONSTRUCTION MANAGER FOR THE PROJECT. AOR/EOR TO COORDINATE ACCORDINGLY.

~~~ **END OF PROJECT NOTE** ~~~

**SECTION 01 78 00
CLOSEOUT SUBMITTALS**

~~~~~ **PROJECT NOTE** ~~~~~

RETAIN OPTION [CxA] FOR PROJECTS THAT REQUIRE COMMISSIONING

~~~ **END OF PROJECT NOTE** ~~~

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Warranties and bonds.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Closeout Meeting: Approximately 2 months prior to scheduled completion of the Work, the Board's Representative will schedule a closeout meeting. All parties involved in the successful opening of the school facility (or turnover of completed work to the Board) will attend, and responsibilities for closeout will be outlined.
 - 1. See Section 01 77 00.01 - Closeout Meeting Checklist
 - 2. This meeting will include the development of a closeout schedule which will outline key dates for accomplishment of tasks by the various parties required for successful on-time completion.
 - 3. The Contractor will be prepared to present pertinent proposed dates of activities requiring the involvement of the Board, Architect/Engineer of Record, [CxA] or Board's Representative, including:
 - a. Demonstration and training
 - b. Delivery and storage of maintenance materials (attic stock)
 - c. Changeover of keying
 - d. Transfer of responsibility for utilities
 - e. Transfer of responsibility for insurance

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- f. Punch List Walkthrough
- g. Board work and activities dependent on completion of Contractor's work (e.g. furniture delivery).

1.03 SUBMITTALS

- A. See Section 01 78 00.01 - Closeout Documents Checklist. Draft Close Out Documents will be reviewed by Architect/Engineer of Record, upon approval a Page-Turn meeting will be scheduled by the Board Representative to review all documents prior to final submittal.
- B. Provide outline of O&M structure as described in section 3.09 "Assembly of Operation and Maintenance Manuals" to Architect **[and CxA]** at 50% construction completion milestone.
- C. Project Record Documents: Submit copies of marked-up print documents to Architect/Engineer of Record **[and CxA]** immediately before inspection for Preliminary Acceptance.
- D. Project Record CAD Drawings: Submit native CAD files to Architect/Engineer of Record **[and CxA]** for review prior to Final Acceptance.
- E. Project Record Product Data.
- F. Operation and Maintenance Data:
 - 1. Submit one copy of completed documents within five days of Preliminary Acceptance. This copy will be reviewed and returned, with Architect/Engineer of Record **[and CxA]** comments. Revise content of all document sets as required prior to final submission.
 - 2. Submit two sets of revised final documents in final hard-copy and electronic form within five days after final inspection. Review and approval by the Architect/Engineer of Record **[and CxA]** is required for Final Acceptance.
 - 3. If copies of the final approved Operation and Maintenance Data are not available at the time of systems Demonstration and Training, provide to the end user preliminary copies of Operations and Maintenance Data covering the scope for each training module.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds:
 - 1. Submit within five days after Preliminary Acceptance. Review and approval of all warranties and bonds is required for Final Acceptance.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
- B. Ensure entries are complete and accurate, enabling future reference by Board.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
 - 4. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

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5. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 - G. Record Drawings: Legibly mark each item to record actual construction including:
 1. Measured depths of foundations in relation to finish first floor datum.
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Measured locations of internal utilities, piping, conduit, and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 4. Field changes of dimension and detail.
 5. Details not on original Contract Drawings.
 6. Revisions to electrical circuitry.
 7. Actual equipment locations.
 8. Duct size and routing.
- 3.02 PROJECT RECORD CAD DRAWINGS (AS-BUILTS)
- A. Project Record Drawings (As-Builts): Documents submitted by a contractor or subcontractor to show the construction of a particular structure or work as actually completed. Project Record Drawings are also referred to as “As-Builts”.
 - B. Following review of Project Record Drawings by Architect/Engineer of Record prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
 1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
 2. Incorporate changes and additional information previously marked on Record Drawings. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Architect/Engineer of Record and Board’s Representative for resolution.
 4. Architect/Engineer of Record will furnish Contractor one electronic set of CAD Drawings of the Contract Drawings for use in recording information.
 - a. Architect/Engineer of Record makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
 5. Record CAD Drawings shall include all referenced files, (font files, menus, shape files, x-refs, etc.) and strictly adhere to the current published CPS guidelines for layering standards.
 6. In addition to native CAD files (dwg, dxf) Provide a complete set of pdf files. Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
 7. Contractor to update title block with “As-Builts Prepared by ABC Contractor, MM/DD/YY”. Each sheet is to have the same title block.
- 3.03 PROJECT RECORD PRODUCT DATA
- A. Compile a complete record of submitted and reviewed product data and other informational submittals required by the contract documents.
 - B. Where Project Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.
- 3.04 OPERATION AND MAINTENANCE DATA
- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
 - B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

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- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- E. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

3.05 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Additional information as specified in individual product specification sections.
- D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.06 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: As specified in individual product specification sections.

3.07 OPERATION AND MAINTENANCE DATA FOR EMERGENCY PROCEDURES

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- A. Assemble Emergency Procedures Manual for installed systems. Organize manual by type of emergency and include appropriate instructions and procedures.
 - B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
 - C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of the Board's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
 - D. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.
- 3.08 OPERATION AND MAINTENANCE DATA FOR CONTROLS AND TEST & BALANCE
- A. The controls contractor and TAB contractor have special O&M manual preparation requirements in Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC that shall be merged with those of this section.

~~~~~ **PROJECT NOTE** ~~~~~

INCLUDE SUBPARAGRAPHS BELOW FOR PROJECTS WITH COMMISSIONING REQUIREMENTS.

~~~ **END OF PROJECT NOTE** ~~~

- B. Contractor shall reference requirements in specification Section 23 09 27 - Building Automation System (BAS) – Commissioning.
 - C. Contractor shall reference requirements in specification Section 27 08 00 - Commissioning of Communications.
- 3.09 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS
- A. Assemble operation and maintenance data into durable manuals for Board's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
 - B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
 - C. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.
 - D. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size, with clear plastic sleeve on spine to hold label describing contents. When multiple binders are used, correlate data into related consistent groupings.
 - E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title and address of Project; identify subject matter of contents.

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- F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect/Engineer of Record, Consultants, Contractor, and subcontractors, with names of responsible parties.
- G. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- H. Dividers: Provide heavy-paper tabbed dividers with plastic coated tabs for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- I. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- J. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- K. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software disks, or other non-standard items.
- L. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents, of all volumes, and of this volume.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Operation and maintenance data.
 - c. Field quality control data.
 - d. Photocopies of warranties and bonds.

3.10 WARRANTIES AND BONDS

- A. Notwithstanding requirements of any other part of the Contract Documents, the Contractor is to submit sample copies of all warranties required under the Contract Documents to the Architect/Engineer of Record **[and CxA]** for review. Include a statement declaring the intended commencement date for each consistent with the requirements of the Contract. Note any warranties requiring signature by the Board.
 - 1. Final Warranties shall be accepted only after the review and approval of the sample warranty by the Architect/Engineer of Record **[and CxA]**.
- B. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within five days after Preliminary Acceptance. Unless otherwise authorized by Board, all warranties will commence on the date of Preliminary Acceptance.
- C. Verify that documents are in proper form, contain full information, and are notarized (where required).
- D. Include lists of circumstances and conditions that would affect validity of warranties or bonds.
- E. Include procedures to follow and required notifications for warranty claims.
- F. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- G. Cover: Identify each binder with typed or printed title WARRANTIES, with title and address of Project; name, and address and telephone number of Contractor.
- H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- J. Provide copies of each warranty with Operation and Maintenance Manual.

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END OF SECTION

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