

SECTION 017700 – PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including Special Requirements, General Conditions and other Division 1 Specifications Sections apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Substantial Completion Inspection procedures
 - 2. Final Completion Inspection procedures
 - 3. Record Document submittals
 - 4. Operating and Maintenance Manual Instructions
 - 5. Final Cleaning

1.3 SUBSTANTIAL COMPLETION INSPECTION

- A. The Work is substantially complete when the Work or designated portion of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.
- B. Substantial Completion Checklist:
 - 1. Before requesting an inspection for Substantial Completion, the following items must be completed and/or submitted to the design professional. Any exceptions shall be listed in the Contractor's request:
 - a. Occupancy permits and similar approvals (L&I)
 - b. Testing/adjust/balance records
 - c. Record Documents Submittals.
 - d. Deliver tools, spare parts, extra stock, and similar required items.
 - e. Complete start-up testing of systems and submit start-up performance reports.
 - f. Complete Operating and Maintenance Instructions with University personnel. (see Part III-Execution)
 - g. Discontinue and remove temporary protection and facilities from the site, along with construction tools, mock-ups, and similar elements. Remove surplus materials, rubbish and similar elements.
 - h. Provide final meter readings (if any)
 - i. Final progress digital photographs
 - j. Complete final cleaning (see Part III-Execution).
 - 2. Request in writing, for the design professional to perform a substantial completion inspection, and stating therein that all the items in the substantial inspection checklist have been completed, or it is explained in the request the reason they are not.

3. Upon receipt of the Contractor request, the Professional and/or Construction Manager will either proceed with the inspection or advise the Contractor of requirements that must be met before the project can be considered ready for the Substantial Completion inspection.
4. Upon inspection, the Professional will either prepare the Certificate of Substantial Completion, or advise the Contractor of work items that must be completed or corrected before the certificate will be issued.

1.4 FINAL COMPLETION INSPECTION

- A. Final Completion is that point in the Contract at which all Work on the Project is complete, and all other Contract requirements have been completed. Final Completion may or may not involve an inspection.
- B. Each Separate Prime Contractor is responsible for requesting Final Completion. Coordination between the various Separate Prime Contractors is required for the execution of any Final Completion inspections that may be required.
- C. Before the Contractor can request Final Completion, the following items shall have been completed by the Contractor and/or been submitted to the University.
 1. Completion of punch list items
 2. Completion of all items required for Substantial Completion
 3. Completion of any and all other Contract requirements
- D. The Contractor shall notify the University that the items required for Final Completion have been completed. If an inspection is required, the request shall be made at least seven (7) days prior to the requested date for the inspection.
- E. Upon receipt of a request for Final Completion, the University shall advise the Contractor of any requirements that must be met before the Project can be considered ready for Final Completion. The Final Application for Payment can only be processed when all items are complete.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Labor & Industry and the Professional's reference during normal working hours. Partial submission of record documents is not permitted. Only completed submittals will be reviewed.
- B. Record Drawings (As-Built)
 1. All Prime Contractors shall maintain a clean, undamaged set of prints of contract drawings and shop drawings. Mark the set to show the actual installation where the installation varies from the work as originally shown. Record a cross-reference at the corresponding location on the contract drawings where shop drawings are used. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 2. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
 3. Record all change order work. Note related Change Order numbers where applicable.

4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
5. Upon completion of the work, submit record drawings to the Professional for the System's records.

C. Miscellaneous Record Submittals

1. Refer to other specification sections for requirements of record keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Professional for the System's records.

D. Operating and Maintenance Instructions Manuals

1. Submittal Schedule

- a. Prior to the Substantial Completion inspection, the Contractor shall submit one draft copies of each operating and maintenance instructions manual to the Professional for review.
- b. After the Substantial Completion inspection, make corrections or modifications to comply with the Professional's comments. Submit the required copies of each corrected manual to the Professional within fifteen days of receipt of the Professional's comments.
- c. Final O&M Manuals: After review and approval by the professional, each prime contractor shall provide two (2) copies of manuals and one (1) electronic submission to the University.

2. Each prime Contractor shall prepare operating and maintenance instructions manuals for its own installations.

- a. Where operating and maintenance instructions manuals include information on installations by the contractor for general construction and another contractor, the contractor for general construction shall prepare the manuals, including collection, collation and binding of the material and submittal of data as specified.
- b. Where operating and maintenance instructions manuals include information on installations by more than one prime contractor, other than the contractor for general construction, the contractor who is the principal source of information, as determined by the Professional, shall receive information furnished by other contractors and bind the material into unified manuals, and submit the manuals as specified.

3. In preparation of the Operating and Maintenance Instructions Manuals, use personnel thoroughly trained and experienced in operating and maintenance of the equipment or system involved. Where written instructions are required, use personnel skilled in technical writing to the extent necessary for communication of essential data. Where drawings or diagrams are required, use draftsman capable of preparing drawings clearly in an understandable format.

4. Manual Organization

- a. Prepare the operating and maintenance instruction manuals in the form of an instructional manual for use by University operating and maintenance personnel. Organize into suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder.
- b. Binders
 - 1) For each manual, provide heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, in thickness necessary to accommodate contents, sized to receive 8-1/2 x 11" paper. Provide a clear plastic sleeve on the spine, to hold labels describing the contents. Provide pockets in the covers to receive folded sheets.
 - 2) Where two or more binders are necessary to accommodate data, correlate data in each binder into related groupings in accordance with the Project Manual, table of contents. Cross-reference other binders where necessary to provide essential information for proper operation or maintenance of the piece of equipment or system.
 - 3) Identify each binder on the front and spine, with the typed or printed title "OPERATION AND MAINTENANCE INSTRUCTIONS MANUAL," Project title or name, and subject matter covered. Indicate the volume number for multiple volume sets of manuals.
- c. Dividers
 - 1) Provide heavy paper dividers with celluloid covers for each separate Section. Mark each tab to indicate contents. Provide a typed description of the product and major parts of equipment included in the Section on each divider.
- d. Protective Plastic Jackets
 - 1) Provide protective transparent plastic jackets designed to enclose diagnostic software for computerized electronic equipment.

5. Manual Content

- a. Organize each manual into separate sections for each piece of related equipment. As a minimum each manual shall contain a title page, a table of contents, copies of product data, drawings and written text, and copies of each warranty, bond and service contract issued (as applicable).
- b. Title Page
 - 1) Provide a title page in a transparent plastic envelope as the first sheet of each manual. Provide the following information and subject matter covered by the manual:
 - a) Name and address of the Project
 - b) Date of submittal
 - c) Name, address, and telephone number of the Contractor.
 - d) Name and address of the Architect

- e) Cross reference to related systems in other operating and maintenance manuals
- c. Table of Contents
 - 1) After the Title Page, include a typewritten table of contents for each volume, arranged systematically according to the Project Manual format. Include a list of each product included, identified by product name or other appropriate identifying symbol and indexed to the content of the volume. Where more than one volume is required to accommodate data for a particular system, provide a comprehensive table of contents for all volumes in each volume of the set.
- d. General Information
 - 1) Provide a general information section immediately following the Table of Contents, listing each product included in the manual, identified by product name. Under each product, list the name, address, and telephone number of the subcontractor or installer, and the maintenance contractor. Clearly delineate the extent of responsibility of each of these entities. In addition, list a local source for replacement parts and equipment.
- e. Shop Drawings and Product Data
 - 1) Where manufacturer's standard printed data is included in the manuals, include only sheets that are pertinent to the part or product installed. Mark each sheet to identify each part or product included in the installation. Where more than one item in a tabular format is included, identify each item using appropriate references from the contract documents. Identify data that is applicable to the installation and delete references to information that is not applicable.
- f. Written Text:
 - 1) Where manufacturer's standard printed data is not available, and information is necessary for proper operation and maintenance of equipment or systems, or it is necessary to provide additional information to supplement data included in the manual, prepare written text to provide necessary information. Organize the text to provide necessary information. Organize the text in a consistent format under separate headings for different procedures. Where necessary, provide a logical sequence of instruction for each operating or maintenance procedure.
- g. Drawings
 - 1) Where drawings or diagrams are required as part of the manual, provide reinforced punched binder tabs on the drawings and bind in with the text. Where oversize drawings are necessary, fold the drawings to the same size as the text pages and use as a foldout. If drawings are too large to be used practically as a foldout, place the drawings, neatly folded in the front or rear pocket of the binder. Insert a typewritten page indicating the drawing title, description of contents and drawing location at the appropriate location in the manual.

- 2) Provide specially prepared drawings where necessary to supplement manufacturer's printed data to illustrate the relationship component parts of equipment or systems, or to provide control or flow diagrams. Coordinate these drawings with information contained in Project Record Drawings to assure correct illustration of the completed installation.
 - 3) Do not use original Project Record Documents as part of the Operating and Maintenance Instructions Manuals.
 - h. Warranties, Bonds and Service Contracts
 - 1) Provide each warranty, bond or service contract in the appropriate manual for the information of the Owner's operating personnel. Provide written data outlining procedures to be followed in the event of product failure. List circumstances and conditions that would affect validity of the warranty or bond.
6. Types of Operating and Maintenance Instructions Manuals
 - a. General Products Manual
 - 1) Submit manufacturer's data and maintenance instructions for those products that are not assigned to one of the other manuals defined in this section.
 - b. Architectural Products Manual
 - 1) Submit manufacturer's data and instructions on care and maintenance of architectural products, including applied materials and finishes. Refer to individual Specification Sections for additional requirements on care and maintenance of materials and finishes.
 - 2) Manufacturer's Data
 - a) Manufacturer's catalog number
 - b) Size
 - c) Material composition
 - d) Color
 - e) Texture
 - f) Reordering information for specially manufactured product
 - c. Care and Maintenance Instructions
 - 1) Provide information on care and maintenance, including manufacturer's recommendations for types of cleaning agents to be used and methods of cleaning. Provide information regarding cleaning agents and methods that could prove detrimental to the product. Include manufacturer's recommended schedule for cleaning and maintenance.
 - d. Moisture-Protection and Weather-Exposed Products Manual
 - 1) Provide manufacturer's data with instructions on inspection, maintenance and repair of products exposed to the weather or designed for moisture- protection purposes.

- 2) Manufacturer's Data
 - a) Applicable standards
 - b) Chemical composition
 - c) Installation details
 - d) Inspection procedures
 - e) Maintenance information
 - f) Repair procedures
- e. Equipment and Systems Manuals
 - 1) Submit each completed manual on equipment and systems, in final form
 - 2) Provide separate manuals for:
 - a) Plumbing Equipment
 - b) HVAC Equipment
 - c) Building Operating/Mechanical Systems
 - d) Electrical Equipment
 - e) Electrical Operating Systems
 - 3) Refer to Specification Sections for additional requirements on operating and maintenance of the various pieces of equipment and operating systems.
 - 4) Provide the following information for each piece of equipment, each building operating system, and each electrical operating system.
 - a) Description: Provide a complete description of each unit and related component parts:
 - (1) Manufacturer's Name, Model #, Serial Numbers
 - (2) Equipment or system function
 - (3) Operating characteristics
 - (4) Limiting conditions
 - (5) Performance curves
 - (6) Engineering data and tests
 - (7) Complete nomenclature and number of replacement parts (spare parts list)
 - b) Manufacturer's Information: For each manufacturer of a component part or piece of equipment, provide printed operating and maintenance instructions, assembly drawings and wiring diagrams required for maintenance, and a list of items recommended to be stocked as spare parts.
 - c) Maintenance Procedures: Provide information detailing essential maintenance procedures, including routine operations, trouble-shooting guide, disassembly, repair and reassemble, alignment, adjusting and checking.
 - d) Operating Procedures: Provide information and equipment and system operating procedures, including the following:
 - (1) Start-up procedures
 - (2) Equipment or system break-in

- (3) Routine and normal operating instructions
 - (4) Regulations and control procedures
 - (5) Instructions on stopping
 - (6) Shut-down and emergency instructions
 - (7) Summer and winter operating instructions
 - (8) Required sequences for electric or electronic systems
 - (9) Special operating instructions, including testing procedures
- e) Servicing Schedule: Provide a schedule of routine servicing and lubrication requirements, including a list of required lubricants for equipment with moving parts.
 - f) Controls: Provide a description of the sequence of operation and as-installed control diagrams by the control manufacturer for systems requiring controls.
 - g) Valve Tags: Provide charts of valve tag numbers, with the location and function of each valve.
 - h) Circuit Directories: For electrical and electronic systems, provide complete circuit directories of panel boards, including electric service, controls, and communication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 INSTRUCTION, TRAINING & DEMONSTRATION

- A. For instruction of the University operating and maintenance personnel, use experienced instructors thoroughly trained and experienced in the operation and maintenance of the building equipment or system involved. Instruct University personnel at mutually agreed upon times in the operation, adjustment, and maintenance of products, equipment and systems. For equipment that requires seasonal operation, arrange for similar instructions during appropriate times. Use operation and maintenance instruction manuals for each piece of equipment or system as the basis of instruction.

Where instruction in operating and maintenance procedures on equipment and systems involves participation of more than one Contractor, the Contractor who is designated by the professional as the principal instructor shall coordinate with the other Contractors for a mutually agreeable time to provide instruction to the University's operating and maintenance personnel.

- B. Each Prime Contractor shall arrange for each installer of equipment that requires regular maintenance to meet with the University's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

- 1. Operating and Maintenance Instructions manuals

2. Spare parts and materials.
3. Tools
4. Lubricants
5. Fuels
6. Identification systems
7. Control sequences
8. Hazards
9. Cleaning
10. Warranties and bonds
11. Service agreements and similar continuing commitments

C. As part of the instructions for operating equipment, demonstrate the following procedures:

1. Start-up
2. Shutdown
3. Emergency operations
4. Noise and vibration adjustments
5. Safety procedures
6. Economy and efficiency adjustments
7. Effective energy utilization

3.2 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Each Prime Contractors shall employ experienced workers for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- C. The General Contractor shall perform final overall cleaning utilizing experienced workers or professional cleaner for the project site and building. This cleaning does not relieve the other primes of final cleaning responsibilities as indicated below.
- D. All Prime Contractors are responsible for the following:
1. Routine cleaning of project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 4. Remove tools, construction equipment, machinery, and surplus material from Project site.
 5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 7. Sweep concrete floors broom clean in unoccupied spaces.
 8. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 9. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

10. Remove labels that are not permanent.
 11. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 12. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
 13. MEP Contractors: Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 14. MEP Contractors: Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 15. Plumbing Contractor: Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 16. HVAC Contractor: Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- E. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.
- F. Construction Waste Disposal:
1. Do not burn waste materials but remove waste materials from the site and dispose of in a lawful manner.
 2. Do not bury debris or excess materials on University property.
 3. Do not discharge volatile, harmful or dangerous materials into drainage systems.
 4. Arrange with the University for disposition of extra materials of value that remains after completion of associated work, when they become University property.

END OF SECTION 017700