

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS
(CFPUA CAPITAL PROJECTS)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Field surveying.
- B. Closeout procedures.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting, and balancing.
- F. Project record documents.
- G. Operation and maintenance data.
- H. Spare parts and maintenance products.
- I. Product warranties and product bonds.
- J. Examination.
- K. Preparation.
- L. Execution.
- M. Cutting and patching.
- N. Protecting installed construction.
- O. Final cleaning.

1.2 FIELD SURVEYING

- A. Employ land surveyor registered for Project layout and location records.
- B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is established by Engineer-provided survey and indicated on Drawings.

- D. Verify easements; confirm Drawing dimensions and elevations.
- E. Provide field surveying and recording services. Establish elevations, lines, and points using recognized survey practices.
- F. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.
- H. Final Record Survey: Prior to Substantial Completion, submit markup of final record in accordance with Project Record Documents in this section.

1.3 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, markups, warranty letters and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
 - 4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities.
 - 5. Deliver spare parts to Owner.
 - 6. Make final change-over of locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
 - 7. Discontinue or change over and remove temporary facilities and services from Project Site.
 - 8. Perform final cleaning according to this Section.
- B. Substantial Completion Inspection:
 - 1. When Contractor considers Work to be substantially complete, submit to Engineer:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
 - 2. Should Engineer determine that Work is not substantially complete:
 - a. Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Engineer.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.
 - 3. When Engineer finds that Work is substantially complete, Engineer will:

- a. Prepare Certificate of Substantial Completion on Owner's Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
 - 4. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
 - 1. When Contractor considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 - 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final adjusting change order documents.
 - c. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - d. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - e. Contractor's affidavit of payment of debts and claims.
 - f. Contractor affidavit of release of liens.
 - g. Consent of surety to final payment.
 - 3. Perform final cleaning for Contractor-soiled areas according to this Section.
- D. Final Completion Inspection:
 - 1. Engineer will make inspection to determine whether Work or designated portion is complete.
 - 2. Should Engineer consider Work to be incomplete or defective:
 - a. Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Engineer that Work is complete.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.

1.4 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Engineer seven days prior to startup of each item.

- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of startup or Substantial Completion.
- B. Demonstrate Project equipment and instructed by authorized manufacturer's representative who is knowledgeable about the Project.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

1.6 PROJECT RECORD DOCUMENTS

- A. Maintain 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.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Record information concurrent with construction progress, not less than weekly. Report recording status at progress meetings.

- D. 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 used.
 - 3. Changes made by Addenda and modifications.

- E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
 - 1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
 - 2. Include locations of concealed elements of the Work.
 - 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
 - 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 - 5. Identify and locate existing buried or concealed items encountered during Project.
 - 6. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 7. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 8. Field changes of dimension and detail.
 - 9. Details not on original Drawings.

- F. Certified, surveyed record drawings ("as-built" plans), sealed by a North Carolina licensed Professional Engineer and Professional Land Surveyor, shall be furnished to CFPUA by the Engineer of Record upon completion and acceptance of the infrastructure by CFPUA. The "as-built" plans shall conform to the as-built checklist included herein.

- G. For sewer projects, the "as-built" plans shall include accurate information regarding pipe size, pipe material, pipe length, manhole construction (size of manhole, invert, rim, alignment, location), services, and pump stations along with any relevant rights-of-way, property boundaries and easements. Plans shall also include sewer profiles showing any utility crossings along with the aforementioned information.

- H. For pump station projects, the "as-built" plans shall include accurate information regarding interior and exterior pipe sizes, material, length, as well as all structural dimensions of the pump station, all electrical equipment (make and model), pump information (make, model, and impeller size), and site layout information. Top plan, sectional plan, and full cross-section views are required on the "as-built" plans.

- I. For water projects, the "as-built" plans shall include accurate information regarding pipe size, pipe material, pipe length, valve locations (and turn direction), hydrant locations, fitting locations, services, and blow-off locations along with any relevant rights-of-way, property boundaries and easements.

- J. Submit marked-up paper copy documents to Engineer at each payment request and before Substantial Completion.

- K. Digital “as-built” information shall be provided by the Engineer of Record in AutoCAD format and PDF format with seal, signature, and date by surveyor and engineer and shall include all information required on the “as-built” drawings. No other digital formats will be accepted.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Contact information for warranty items.
 - g. Safety precautions to be taken when operating and maintaining or working near equipment.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop Drawings and product data.
 - b. Certificates.
 - c. Photocopies of warranties and bonds.

1.8 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to Project Site and place in location as directed by Owner; obtain receipt prior to final payment.

1.9 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Examine and verify specific conditions described in individual Specification Sections.
- C. Verify that utility services are available with correct characteristics and in correct locations.

3.2 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step, in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
- E. Allow for expansion of materials.
- F. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
 - 1. Refer questionable mounting heights choices to Engineer for final decision.
- G. Adjust operating products and equipment to ensure smooth and unhindered operation.
- H. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.3 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and nonconforming Work.
 - 4. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.

- G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest joint or intersection; for equipment assembly, refinish entire unit.
- J. Identify hazardous substances or conditions exposed during the Work to Engineer for decision or remedy.

3.4 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Protect corrosion protected (coated) surfaces. When activity is necessary, obtain recommendations for protection from coating material manufacturer.
- D. Prohibit traffic from landscaped areas.

3.5 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
- B. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- C. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION