

SECTION 01 77 00

PROJECT CLOSE-OUT PROCEDURES

PART 1 – GENERAL

1.1 PURPOSE

- A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UT Arlington) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UT Arlington and may require justification through Life Cycle Cost (LCC) analysis and submitted to UT Arlington for approval.

1.2 RELATED DOCUMENTS

- A. Provisions established within the Uniform General and Supplementary General Conditions for University of Texas System Building Construction Contracts (UGC), all Sections of Division 1 - General Requirements, other applicable Sections of all Divisions of Specifications, and the Drawings are collectively applicable to this Section. In the event of conflict between specific requirements of the various documents, the more restrictive, the more extensive (i.e.: more expensive) requirement shall govern.

1.3 SECTION OVERVIEW

- A. General Description of Closeout Requirements
- B. Requirements for Substantial Completion
- C. Provisions for Release of Retainage
- D. Requirements for Final Acceptance
- E. Required Project Record Documents
- F. Project Cleaning

1.4 GENERAL DESCRIPTION OF CLOSEOUT REQUIREMENTS

- A. DEFINITION: Project Closeout is hereby defined to include requirements near the end of the Contract Time, in preparation for substantial completion acceptance, occupancy by Owner, release of retainage, final acceptance, final payment, and similar actions evidencing completion of the work. Specific additional requirements for individual units of work are specified in Sections of Divisions 2 - 48.
- B. TIME of closeout is directly related to completion and acceptance, and therefore may be either a single time period for the entire project, or a series of time periods for individual portions or phases of the project that have been certified as substantially complete at different dates.
- C. This Section is based on completion and acceptance of the entire project during a single time period.
 - 1. If the project is to be accepted in phases, whether by originally specified project scope or by subsequent agreement between the parties, then Project Closeout requirements shall pertain to each separately accepted portion or phase of the project; unless by written notice the Owner allows for these requirements to be done singularly upon anticipated acceptance of the final phase.
- D. RECORD DOCUMENTS for Project Closeout include, but are not necessarily limited to the following drafts, which are required at substantial completion:
 - 1. As-Built Record Drawings
 - 2. As-Built Record Specifications
 - 3. Operating & Maintenance Manuals
 - 4. Record Approved Submittals and Samples
 - 5. Certification of No Asbestos Products Incorporated in Project
 - 6. Completed Punch Lists
- E. REQUIRED DOCUMENTS for final payment to be released include final versions of all of the above and the following:
 - 1. Final Release of Claims & Liens
 - 2. Affidavit of payment of Debt and Claims
 - 3. Consent(s) of Surety
 - 4. Completed SWPPP documents and Notice of Termination (if applicable)
 - 5. Final Historically Underutilized Business Plan

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

6. Completed Commissioning and Closeout Manual

1.5 REQUIREMENTS FOR SUBSTANTIAL COMPLETION

- A. Prior to requesting Architect and Owner to schedule a Substantial Completion, or Pre-Final, inspection (for either the entire work or portions thereof as agreed to by the parties to the contract); complete the following and list known exceptions in request.
1. In progress payment request coincident with period of time anticipated for Substantial Completion, Contractor's payment request should reflect a minimum of 95% completion for all applicable work.
 2. Submit to Architect and Owner a complete copy of the Contractor's most current punch list covering the portion(s) of the Project claimed as substantially complete.
 - a. Such punch list shall indicate dates of Contractor re-checks and Schedule for Completion of work items remaining.
 - b. All items remaining outstanding on the Contractor's punch list shall include a projected date of completion and/or correction with an explanation of why such is not presently completed.
 3. Submit to Architect for review, the full set of as-built blue line marked-up record drawings and marked-up record specifications as described later in this Section.
 4. Submit to Architect for review the preliminary copies of Owner's Operating and Maintenance (O&M) Manuals as described later in this Section.
 5. Provide access to Contractor's copy of the Commissioning and Closeout Manual for review by Owner and Architect. The Manual shall be up to date before the Substantial Completion inspection can be requested.
 6. Submit certification statement that no asbestos containing materials have been used or incorporated into the project.
 7. Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including (where applicable) operating certificates, and similar releases.
 8. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.
- B. If the Owner intends to occupy Project upon Substantial Completion Acceptance, the Contractor shall make provisions for final changeover of locks with the Owner's personnel. Upon written directive from Owner, this task may be waived until final acceptance for the convenience of the Contractor in completing punch list activity.
- C. Complete instructions of Owner's personnel for all systems and equipment serving the areas claimed as substantially complete, for which Owner Training was not completed in association with system demonstrations and inspections. Refer also to Section 01 91 00 - Project Commissioning.
- D. Complete initial clean up requirements as described later in this Section for the entire portion of the Project claimed as substantially complete. Touch up and otherwise repair and restore marred exposed finishes.
- E. Substantial Completion Inspection Procedure
1. Refer to UGC and Section 01 45 00 - Project Quality Control
 - a. The Contractor shall ensure the work is ready for inspection and/or re- inspection. If the work is found not to be as stated in the Contractor's punch list or the items have not been substantially corrected/completed; the inspection will be terminated all costs for the Owner and A/E team for scheduling and attendance at the terminated inspection(s) shall be the responsibility of the Contractor.

1.6 PROVISIONS FOR RELEASE OF RETAINAGE

- A. Refer to UGC.
- B. Release of any retainage, or reduction in amount of retainage withheld, is strictly at the discretion of the Owner, regardless of Contractor compliance with requirements. All of the requirements noted for Substantial Completion Acceptance must be completed prior to application for final release of contract retainage. In addition, meet the following requirements:
1. Submit affidavits of final release of claim and lien from each subcontractor and supplier who provided materials and/or labor to the Project.
 2. Submit affidavit that all bills for the Project have been paid, or will be paid within thirty (30) days of Contractor receipt of payment.
 3. Submit Consent of Surety to Release of Retainage.

1.7 REQUIREMENTS FOR FINAL ACCEPTANCE

- A. Prior to requesting Architect and Owner to schedule Final Inspection for the Project, complete the

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

following:

1. Prepare draft payment request showing 100% completion for each line item on the Schedule of Values. Submit with this draft all final releases and supporting documentation not previously submitted and accepted. Include Certificates of Insurance where applicable. Note that Final Payment, including final release of retainage, will not be issued until all work (including punch list items) has been completed, all requirements met, a project closeout audit performed (if deemed necessary) and a Final Change Order has been processed if required to resolve final cost or closeout audit issues, including deletion of any remaining contract allowances.
 2. Submit copy of Architect/Engineer's Pre-Final, Substantial Completion, or Punch List, which includes evidence that each item has been completed or otherwise resolved.
 3. Submit final record as-built drawings and specifications, 2 copies of all approved submittals, and operating & maintenance manuals as described later in this Section. This includes specific warranties, maintenance agreements, product certifications and similar documents. Record closeout documentation must be acceptable to Architect and Owner prior to issuance of final payment.
 4. Transmit completed Commissioning and Closeout Manual to the Owner. This manual shall be complete, acknowledging receipt of all attic stock, spare parts, training/demonstration, test reports and any other requirements of the contract documents.
 5. Complete final cleaning requirements, including touch-up of marred surfaces.
 6. Submit final payment request, including the following documentation:
 - a. Consent of Surety
 - b. Release of Liens and Claims
 - c. Affidavit of payment of Debts and Claims
 - d. Final Historically Underutilized Business Plan.
 - e. Completed and signed Notice of Termination
 7. Revise and submit evidence of final and continuing insurance coverage complying with applicable insurance requirements.
- B. Final Acceptance Inspection Procedure
1. Upon compliance with all above noted requirements, and following completion of the work required in the substantial completion punch list, provide written notice to the Architect and Owner that the project is ready for Final Inspection. Refer to UGC for additional requirements.
 2. All Owner and Architect costs for travel and man-hours for additional inspections at either Substantial Completion or Final Acceptance which are required either by failure of the Contractor to complete the noted punch list items, or by erroneous notices that the work is ready for such inspections, will be the responsibility of the Contractor. Such costs will be deleted from the contract amount in Change Order.

1.8 REQUIRED PROJECT RECORD DOCUMENTS

A. As-Built Record Drawings and Specifications

1. Prior to Requesting Substantial Completion, and as a pre-requisite thereto, and prior to submitting application for Payment including release of any sums held as retainage, and in lieu of the following requirement in UGSGC 6.2.4 to "*...provide mylar prints of professionally drafted "As Constructed" drawings, along with electronic copy on CD, "As-Constructed" specifications in bound volume(s) along with electronic copy on CD...*"
2. Contractor shall provide instead, in electronic format as specified herein, all Operating and Maintenance manuals, approved submittals, shop drawings, warranties, certificates, test reports, record documents, commissioning documentation and other items as required by the contract. This requirement is in addition to hardcopies of these documents and all other submittals required elsewhere in the contract, except as specifically stipulated herein.

B. All small format (11" x 17") or smaller photographs, cut sheets, sketches, instructions, diagrams & graphical literature shall be scanned at a resolution of at least 300 DPI to produce sufficient quality to allow zoom features and readable prints. Color charts or other documents where color is required to convey full information shall be scanned in color. Color line drawings shall be scanned at 200 DPI to avoid excessive file size.

C. All documents shall be scanned into a single file in current version of Adobe PDF format with expandable indexed file structure organized according to current CSI format and shall conform to AIA standards, bookmarked to at least Division and Section level and searchable by keyword. Verify that all pages on every document have been scanned. Review each page to ensure scan captures original detail. If images appear too dark or too light, or smudged, rescan to ensure proper image quality & legibility.

D. Proper labeling must appear on the disk and jewel case to include the Owner's Name (UT Arlington),

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

- Project No & Title, Contents of CD / DVD (O&M Record Documents DIV 1- 12 or ?), the Sequence Number of the disk if part of a multi-disk set (i.e. DVD 1 of 3) and the Archive Date. CD/DVD must be inkjet printable not using adhesive labels which can delaminate and gum up reader mechanism.
- E. Prior to final submission, 2 preliminary sets shall be provided for review and approval: One set for Project Architect/Engineer (AE) to review for completeness and accuracy, and one for UT Arlington Facilities Management (FM) to review for conformance to format and files structure as stated herein. Upon acceptance by Project AE and UT Arlington FM, provide 6 sets of CD-ROM's or DVD's.
 - F. This change in no way modifies or alters other requirements of UGSGC 6.2 through 6.2.4 or in any way diminishes contractor's responsibility therein defined regarding the requirement prior to requesting Substantial Completion to, *"furnish a complete set of the marked up 'As-Constructed' set maintained at the site and one photocopy of same."* Nor does it in any way affect the contractor's obligation under UGSGC 6.2.3 to, *"Concurrently with furnishing these record drawings, furnish preliminary copy of each operating and maintenance manual (O&M) required by the Contract Documents, for review by the AE and the ODR."*
 - G. Additionally, the requirement of UGSGC 6.2.4 to provide, once determined acceptable, *"2 sets of operating and maintenance manuals, two sets of approved submittals, and other record documents as required elsewhere in the Contract Documents"* shall remain in effect, however only one of these hardcopy sets shall now be required.
 - 1. MAINTENANCE OF AS-BUILT DRAWINGS DURING CONSTRUCTION
 - a. During progress of the work, maintain a blue line set of contract drawings along with specifications and shop drawings in the construction office. Update these drawings weekly, at a minimum, with markup of actual installations, which vary from the work as originally shown.
 - b. Mark whatever drawing is most capable of showing actual physical condition, fully and accurately, and reference all other appearances of this work to the sheet, which was updated. Include cross-reference to the official change number on the updated sheet and all additional sheets where the work is shown.
 - 1). Mark with erasable colored pencil, using separate colors where feasible to distinguish between changes for different categories of work at same general location.
 - 2). Mark up important additional information, which was either shown schematically or omitted from original drawings. Give particular attention to information on work concealed, which would be difficult to identify or measure and record at a later date.
 - 3). Note alternative numbers, change order numbers and similar identification for any change.
 - 4). Require each person preparing markup to initial and date markup and indicate name of firm.
 - c. The Contractor shall maintain and have available for review in conjunction with the regular project meetings, a current set of the as- built blue line drawings and specifications marked with "as constructed" information. Availability for review, and acceptability, of both the format and the content is a prerequisite condition for certification of monthly pay requests by the Owner and Architect.
 - H. Supplemental Drawings
 - 1. Where marked-up shop drawings are intended for inclusion in the record set, mark cross-reference on contract drawings at corresponding location. Use of shop drawings as supplements to the record as-built is encouraged for all items which require the larger scale employed on the shop drawings in order to show the work in sufficient detail to be of future use to the Owner.
 - a. Use of such shop drawings is particularly applicable to ductwork and electrical shop drawing layouts. Use of shop drawing supplements is acceptable so long as the following conditions are met:
 - 1). Regardless of overall size of the original shop drawings, the Contractor shall provide shop drawings with equivalent titles as the contract drawings and other record as-built drawings. Include project name and number as well as the applicable submittal number.
 - 2). The applicable supplemental sheet shall be placed in the set directly behind the contract drawing, which it supplements, with appropriate reference notes on both the applicable contract drawing and all other affected drawings.
 - 3). The supplemental document shall be identified as a "Supplementary Record As- Built Drawing" and shall be numbered with an extension to the contract drawing it supplements in a manner acceptable to the Owner.
 - I. Preparation of Final As-Built Drawings
 - 1. This Section requires that a copy of the marked-up blue line as-built be submitted to the Architect for

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

review prior to requesting substantial completion inspections.

- a. Following the Architect's review of the marked-up blue lines, and upon authorization by the Architect based on their belief that the marked-up information is accurate and complete, the Contractor shall proceed with preparation of a full set of professionally drafted record drawings.
 2. All record as-built drawings and supplemental shop drawing sheets must be reproduced in both hard copy and PDF format on a compact disk (CD). This includes the entire set of contract drawings, whether or not individual sheets are affected by as-built data.
 3. All drawings shall bear the official project name and number. Further, each drawing, including supplemental drawings, shall also bear a stamp to the effect of "Record As-Built" along with the Contractor's certification that such is an accurate reflection of actual as-built conditions. Each certification shall be signed and dated and shall be acceptable to the Owner.
 - a. All drawings shall be the same size as original contract documents.
 - b. All drawings issued as addenda, clarifications and/or change orders shall be incorporated into the record as-built drawing set. Such shall be fully shown on the applicable contract drawing. If supplemental sheets are used, follow the requirements outlined above for supplemental shop drawing sheets.
- J. As-Built Record Specifications
1. During progress of the work, maintain and update one record copy of specifications at the jobsite, including addenda, change orders and similar modifications issued in printed form during construction, to indicate all significant variations in actual work in comparison with text of specifications as originally issued.
 - a. Give particular attention to substitutions, selection of options, and similar information on work where the exact products used are not clearly identified or readily discernable in the original specifications. Note: related record drawing information and product data, where applicable.
 - b. It is not necessary to re-type an entire section if modified, but it is mandatory that all changes to specified materials, installation, warranty, etc. be clearly and fully marked within the applicable specifications section in a manner acceptable to the Architect and the Owner. Such should be reviewed and a documentation procedure established early in the construction period.
 2. In association with request for substantial completion inspection, submit the marked-up copy of the Project Specifications to the Architect for review.
 3. Once the marked-up Project Specifications are found acceptable by the Architect, and upon his authorization, based on his belief that the marked-up information is accurate and complete; proceed with preparation of a Record Set Project Specifications.
 - a. Neatly transcribe and post all as-built mark-up information to a "clean" copy of the Project Specifications, insuring that similar types of information is annotated in like fashion throughout the Specifications.
 4. Once completed, submit both the mark-up site copy of the Project Specifications and the newly prepared Record Project Specifications to the Architect for review and, if acceptable, for subsequent transmittal to the Owner.
- K. Operating and Maintenance Manuals
1. In general terms, the Contractor is to organize maintenance-and-operating manual information into suitable sets of manageable size, and bind into individual binders properly tabbed and indexed.
 - a. Such shall include emergency instructions, spare parts listings, warranties, wiring diagrams, inspection procedures, shop drawings, product data, and similar applicable information.
 - b. Such shall be bound in heavy-duty, 3-ring vinyl covered binders including pocket folders for folded sheet information. Mark binder identification on both front and spine of each binder.
 - c. 2 complete copies of each bound O&M Manual are required. In addition, the Contractor shall provide 2 copies of the O & M Manuals on compact disks (CD's) in PDF format.
 2. The requirements of this Section are separate, distinct and in addition to product submittal requirements that may be established by other Sections of the Specifications. Owner's manuals, manufacturer's printed instructions, parts lists, and other submittals required by other Sections of the Specifications may be included in the O&M Manuals provided that they are approved and are formatted in a manner consistent with the requirements of this Section.
 - a. Test data and Commissioning data included in the O&M Manuals need not be duplicated in the Commissioning and Closeout Manual. Test data not pertaining to a particular device or piece of equipment (such as domestic water pipe pressure test reports) shall be inserted in the C&C Manual.

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

3. Equipment is defined as any mechanism, mechanical, electrical or electronic device, or any combination thereof, which is made up of 2 or more working parts to perform a particular function.
4. When an item of equipment is a packaged unit furnished by one manufacturer and the package as furnished contains proprietary items of equipment obtained from other sources; copies of equipment data as required herein shall be furnished for each item of such equipment as if it has been separately furnished.
5. For general guidance only, the following are examples of equipment, material, and systems for which operating and maintenance data is required:

Pipe & Fittings	Air Handling Units
Gate Valves	Temperature Controls
Elevators	Pumps & Controllers
Electrical Switchgear	Irrigation Systems
Light Fixtures	Fire Sprinklers
Transformers	Security Systems
Electric Panels	Wall Light Switches
Circuit Breakers	Motors & Devices
Metal Fabrications	Telephone Systems
Pressure Gauges	Fume Hoods
A/C Diffusers	Fire Alarm Systems
Sterilizers	Compressors
Laboratory Casework	Overhead Coiling Doors
Finish Hardware	Access Flooring
Automatic Door Operators	Finish Materials

6. All the applicable data for any one item of equipment or material or system shall be bound together as a package, within a manual containing like equipment, materials, or systems, as indicated by the appropriate specification division. Each package of data shall be numbered according to the Specification Section governing the particular system.
7. All data furnished in accordance with this Section shall be submitted on bond 8½" x 11" sheets or on sheets that are bond and folded multiples of 8½" x 11". The bond edge shall be the left 11" edge.
8. Waivers to the size requirement may be requested in specific instances upon application in writing to the Architect and Owner with justification for substitution in size.
9. Material and equipment data required by this Section is intended to include all data necessary for the proper installation, removal, normal operation, emergency operation, startup, shutdown, maintenance, cleaning, adjustment, calibration, lubrication, assembly, disassembly, repair, inspection, trouble shooting and service of the equipment or materials.
10. The UGC requires that a preliminary copy of all operating and maintenance manuals, in addition to as-built documents, be furnished prior to the Substantial Completion inspection. The Contractor is to accumulate and package the documentation, and submit it to the Architect for review.
11. The Contractor's submission of a preliminary copy of all O&M Manuals to the Architect for review is a precondition for scheduling of a Substantial Completion Inspection. The Contractor's final submission of these Manuals in an acceptable format (based on review of preliminary copies by the Architect) is a precondition for scheduling of a Final Acceptance Inspection, release of remaining contract retainage or application for Final Payment.
12. Equipment Data to be Included in O&M Manuals
 - a. Description of Equipment shall be prepared upon 8½" x 11" forms. Include one such form for each item of equipment. Refer also to the equipment list requirements of Sections 01 91 00 - Project Commissioning, 23 00 00 - General Mechanical and 26 00 00 - General Electrical. The equipment information to be included in the O&M Manuals is as follows:
 - 1). Complete description of item: Such should list basic descriptive terminology first, followed by modifying words to include model, size and weight, flow rate, amperage, voltage, material, etc., as applicable, plan designation, if any, and package serial number.
 - 2). Part Number: Manufacturer's and supplier's part number.
 - 3). Quantity: Total quantity of this equipment item installed under this Contract.
 - 4). Specification Paragraph Reference: State the specification section and paragraph under which the item of equipment was procured, and page number.

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

- 5). Source: Manufacturer's name and address and supplier's name and address.
 - 6). Serial Number: Complete manufacturer's serial number(s) or other identity symbol(s) as applicable.
 - 7). Location: State the name of the system and/or sub-system in which each like item of equipment is installed and state the physical location of each like item of equipment by identifying the columnar grid intersections, as shown on the plans, near which the item is located and also state the room or space title as applicable.
- b. Parts Lists which clearly identifies every part in the item of equipment with the proper manufacturer's name, part nomenclature and number, local source, and list price.
 - c. Recommended Spare Parts: Furnish a list of recommended spare parts for each equipment item that will be needed to support that item of equipment for a 12-month period. The quantities of spare parts recommended shall be based upon the quantity of like equipment items installed under the Contract. The recommended spare parts list for each equipment item shall be prepared upon 8½" x 11" forms which contain the following information for each part in columns:
 - 1). Part Description: Complete descriptive nomenclature plus manufacturer's complete model and part number, and list price cost for each part.
 - 2). Quantity Per Assembly: Quantity of listed part that occurs in the item of equipment.
 - 3). Quantity Per Assembly: Quantity of like equipment items installed under this Contract.
 - 4). Shelf Life: Storage life of part, in months, if the part has limited life.
 - 5). Recommended Quantity: Quantity of part recommended to support the installed quantity of equipment in which the part appears for a period of 12 months.
 - 6). Source for part: Name, address, and phone number of the nearest supplier for the part.
 - d. Contractor's Purchase Order: Copy of Contractor's purchase order for equipment. The copy furnished need only show quantity ordered, part number, equipment description and name and address of vendor who supplied the item.
 - e. Normal Operating Instructions: Normal operating instructions shall provide sufficient detailed information to permit a journeyman mechanic to adjust startup, operate and shut down the equipment. Special startup precautions must be noted as well as other action items required before the equipment is put into service.
 - f. Emergency Operating Procedures: A detailed description of the sequence of action to be taken in the event of a malfunction of the unit, either to permit a short period of continued operation or emergency shutdown to prevent further damage to the unit and to the system in which it is installed.
 - g. Preventive Maintenance: Detailed information to cover routine and special inspection requirements, including field adjustments, inspections for wear, adjustment changes, packing wear, lubrication points, frequency and specific lubrication type required, cleaning of the unit and type solvent to use, and such other measures as are applicable to preventive maintenance program.
 - h. Calibration: Detailed data on what to calibrate, how to calibrate, when to calibrate and procedures to enable checking the equipment for reliability or indications as well as data for test equipment, special tools and the location of test points.
 - i. Scale and Corrosion Control: Detailed information covering the prevention of and removal of scale and corrosion.
 - j. Trouble Shooting Procedures: Detailed information and procedures for detecting and isolating malfunctions and detailed information concerning probable causes and applicable remedies.
 - k. Removal and Installation Instructions: Detailed information concerning the logical sequence of steps required to remove and install the item including instructions for the use of special tools and equipment.
 - l. Disassembly and Assembly Instructions: Detailed illustrations and text to show the logical procedure and provide the properly. The text shall include all checks and special precautions as well as the use of special tools and equipment required to perform the assembly or disassembly.
 - m. Repair Instructions: Detailed repair procedures to bring the equipment up to the required operating standard including instruction for examining equipment and parts for needed repairs and adjustments, and tests or inspections required to determine whether old parts may be reused or must be replaced.
 - n. System Drawings: Detailed drawings, where applicable, that clearly show wiring diagrams, control diagrams, system schematics, pneumatic and fluid flow diagrams, etc., which pertain to the unit function. Drawings are required to show modifications to another manufacturer's standard unit

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

which is incorporated into the assembly or package unit.

- 1). System diagrams shall be provided on multiples of 8½" x 11" format, folded to fit within the Manual. The outer (exposed) face of the folded drawing shall include identification of the system and the specification section that governs its installation and operation.
 - 2). The requirements of this paragraph are separate, distinct, and in addition to similar requirements that may be established by other Sections. Where such system diagrams are required for submittal by other specification sections, the same diagrams will be acceptable for inclusion herein, so long as the diagrams used were approved during the submittal phase and they are reproduced for clarity and to fit the size format of the O&M Manual.
 - 3). The Contractor shall provide diagrammatic drawings for each installed system, which shall show the placement of the system in relation to the building, and the physical location of each item or equipment installed within the system. Each installed item of equipment shown on the drawing will be identified by the equipment item model and/or serial/part number.
 - 4). System drawings may, for purpose of clarity, be prepared upon a major subsystem basis.
 - 5). The drawings may be prepared upon several drawings having referenced match lines.
 - o. Special Tools and Test Equipment: Furnish a detailed list of the special tools and test equipment needed to perform repair and maintenance for each equipment item. The list shall contain the special tool and test equipment part number, size, quantity, price, manufacturer's name and address, and local supplier's name and address.
 - p. Warranties & Guarantees: Bind within the tabbed section for each system, equipment item, or material, an executed copy of the specified warranty/guarantee covering that particular system, equipment item, or material.
 - 1). This is to include both the manufacturer's warranty as specified and the installing contractor's guarantee for workmanship and system operation.
 - 2). This copy of the particular warranty/guarantee is in addition to original signature copies of all project warranties/guarantees bound together separately. This binder shall be transmitted to the Owner when complete.
 - 3). Provide in a separate tabbed section of the O&M Manual a grouping of all project warranties and guarantees as required by various specification sections and other conditions of the Contract. This is to include all specific warranties on manufactured items and installed systems as noted above, in addition to General Contractor's project warranty and applicable guarantees from all subcontractors and suppliers covering defects in workmanship or manufacture.
 - 4). As clarification, it is intended that the Owner be provided with a separate binder containing all original project warranties and guarantees. Also provide a copy of the appropriate warranty in the same section as the equipment (or system) data furnished in individual tabbed sections of the O&M Manuals for convenient reference.
 - q. Training of Owner Personnel: Documentation of training of Owner's Personnel regarding operation of particular systems shall be included within the tabbed section for that particular system. Such documentation shall include identification of parties receiving training and date(s) of such training.
- L. Miscellaneous Record Information
1. The following shall be bound in like manner to above noted equipment data and system drawings. It is suggested that a separate tabbed section be included in the Commissioning and Closeout Manual for these Miscellaneous Items. Categories of requirements resulting in the miscellaneous work records are recognized to include, but not limited, the following:
 - a. Required field records on excavations, foundations, underground construction, wells and similar work.
 - b. Accurate survey showing locations and elevations of underground lines, including invert elevations of drainage piping.
 - c. Surveys establishing lines and levels of building.
 - d. Plant treatment records (wood, soil, etc.).
 - e. Certifications received in lieu of labels on products and similar record documentation.
 - f. Batch mixing and bulk delivery records.
 - g. Testing and qualification of tradesmen.
 - h. Documented qualification of installation firms.
 - i. Load/performance testing.
 - j. Final inspection and deficiency corrections.
- M. Record Product Submittals

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

1. During progress of the work, maintain approved copies of each product data submittal and shop drawing, and mark up significant variations in the actual work in comparison with submitted information. Include both variations in product as delivered to site, and variations from manufacturer's instructions and recommendations for installation.
 - a. A separate binder with one copy off all MSDS sheets for any and all products incorporated into the project shall be maintained during the course of the project. This binder shall be included in the record submittal documents.
 2. Give particular attention to concealed products and portions of the work that are not clearly identified in the original submittal or cannot otherwise be readily discerned at a later date by direct observation. Cross reference the change orders and markups of record drawings and specifications.
 3. Upon completion of as-built revisions, submit two complete sets of all approved submittals to Architect for review and subsequent transmittal to Owner. Organize and group files in sturdy file boxes with tabbed dividers for each separate specification division. Include a complete table of contents.
 4. These record submittal requirements are in addition to inclusion of similar material as supplementary as-built drawings or technical data for the O&M Manuals.
- N. Record Sample Submittal
1. Immediately prior to date(s) of substantial completion, arrange for Architect and Owner's representative to meet with Contractor at site to determine which (if any) of the submitted samples or mock-ups maintained by Contractor during progress of the work are to be transmitted to Owner for record purposes.
 2. Comply with Architect's instructions for packaging, identification marking, and delivery to Owner's designated location at the Project Site or the Physical Plant.
 3. Dispose of other samples in manner specified for disposal of surplus and waste materials, unless otherwise indicated or directed by Architect.
- O. Commissioning and Closeout Manual (C&C Manual)
1. The Contractor shall incorporate all commissioning and closeout documentation and/or verification not included in the O&M manuals, into a Manual for transmittal to the Owner at the conclusion of the project.
 2. This Manual is intended to be a consolidation of documentation/verification for the project Commissioning and Closeout process.
- P. Requirements for production of this manual are found in Section 01 91 00 Project Commissioning.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PROJECT CLEANING AT SUBSTANTIAL COMPLETION

- A. The Contractor is required to maintain the project and site in a clean and orderly condition throughout the course of construction. In addition to continuous project cleaning, the following requirements are related to project closeout.
- B. Special cleaning for specific units of work may also be specified in other sections of Project Specifications.
- C. Provide an initial cleaning of the work consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program.
- D. Comply with manufacturer's instructions for cleaning of all system components, equipment, and materials incorporated into the Project.
- E. The following "initial" final cleaning is to be accomplished immediately prior to the time the Contractor requests Substantial Completion Inspection:
 1. Remove labels that are not required as permanent labels.
 2. Clean exposed hard-surfaced finishes, including glass, metals, stone, concrete, painted surfaces, plastics, tile, wood, special coatings, and similar surfaces, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Restore reflective surfaces to original condition.
 3. Remove debris and surface dust from limited-access spaces including plenums, shafts, and similar spaces.
 4. Clean concrete floors in non-occupied spaces, wet-mop and broom clean.
 5. Clean fixtures and lamps of all dust and debris.
 6. Remove crates, cartons and other flammable waste materials or trash from work areas. Building(s) shall be turned over to the Owner free of concealed garbage, trash and rodent infestation. If any of the

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

- preceding is revealed, or odors from them occur, they shall be removed by the Contractor at his expense. Restore property to its original condition where no improvements are shown.
7. Elevator shafts, electrical closets, pipe and duct shafts, chases, furred spaces, and similar spaces which are generally unfurnished, shall be cleaned and left free from rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt and dust.
 8. Rubbish shall be lowered by way of chutes, taken down on hoists, or lowered in receptacles. Under no circumstances shall any rubbish or waste be dropped or thrown from one level to another within or outside the building(s).
 9. Care shall be taken by workmen not to mark, soil, or otherwise deface finished surfaces. In the event that finished surfaces become defaced, all costs for cleaning and restoring such surfaces to their originally intended condition shall be the responsibility of the Contractor.

3.2 PROJECT CLEANING AT FINAL ACCEPTANCE

- A. The following "final" cleaning is to be accomplished immediately prior to the time the Contractor requests Final Acceptance Inspection:
 1. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision- obscuring materials.
 2. Turn the work over in immaculate condition inside and outside including the premises.
 3. Clean all work on the premises including walks, drives, curbs, paving, fences, grounds and walls. Slick surfaces shall be left with a clear shine. Cleanup shall include removal of smudges, marks, stains, fingerprints, soil, dirt, paint, dust, lint, labels, discolorations and other foreign materials.
 4. Clean all finished surfaces on interior and exterior of project (again) including floors, walls, ceilings, windows, glass, doors, fixtures, hardware and equipment. Final wax and polish all natural finish metal on interior or exterior surfaces. Clean and apply finish (including wax) to all floors as recommended by the manufacturer.
 5. In addition to the cleaning specified above and the more specific cleaning required in various sections of the specifications, the building(s) shall be prepared for occupancy by a thorough cleaning throughout, including washing (or cleaning by approved methods) surfaces on which dirt or dust has collected, and by washing glass on both sides. Wash exterior glass using a window- cleaning contractor specializing in such work.
 6. Remove temporary buildings and structures, fences, scaffolding, surplus materials and rubbish of every kind from the site of the work. Repair these areas to be compatible with the surrounding construction finished condition.

END OF SECTION 01 77 00

REVISION LOG

The following is provided for convenience to the Owner, Architect/Engineer and Contractor to track changes between annual document issuances and is not to be considered by any party to be contractual or 100% complete.

05-03-11	Updated required project record documents 1.7.XX