

*The following language shall be included minimally in the project specification section and supplemental to language normally supplied by the design team. The project team is to modify and/or expand the language as appropriate to the project.*

## SECTION 01 17 71 – PROJECT TURNOVER REQUIREMENTS

### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. This section details the requirements for project turnover and record document information required prior to project closeout, including but not limited to, the following:
  - 1. Mark-Up Record Drawing Documents
  - 2. As-Built Record Drawing Documents
  - 3. Equipment Start-up and Demonstration of Operation
  - 4. Project Turnover Procedure

### MARK-UP RECORD DRAWING DOCUMENTS

- A. Mark-up Drawings: During construction, all contractors shall maintain one set of full size, hard copy contract plans at the site, dedicated for use as a mark-up record/as-built set of documentation.
  - 1. Mark up plans as construction progresses and maintain continuously during the project.
  - 2. Maintain the as-built/mark-up set (site “red-lines”) available for review by the architect, owner, and owner’s representatives.
  - 3. Failure to maintain accurate as-built mark-ups will constitute sufficient justification for withholding payments to the contractor.
  - 4. The corrections on the as-built/mark-up set shall be incorporated into original contract plan CAD files for final delivery to the owner. All plans shall be included in the set.
  - 5. The plans shall be marked to show deviations in actual construction from the contract drawings. Deviations shall be shown in the same general detail utilized in the contract drawings. The drawings shall show the following information, but not be limited to:
    - a. Locations and descriptions of any utilities constructed or located within the construction limits. Provide survey point numbers on the plans for reference.
    - b. Locations and dimensions of changes within the facility. Floor plan/layout changes should also include revised room numbers, as physically tagged in the field.
    - c. Changes in grade, alignment, location, elevations, details, and dimensions of all work including facilities, structures, roads and utilities.

- d. Incorporate approved sketch (SK) drawings.
- e. Where the contract drawings show options, show only the option used in construction

## 1.2 AS-BUILT RECORD DRAWING DOCUMENTS

***Process: The design team and contractor's construction manager shall combine items A-D in this section to create the record plans and matching electronic formats.***

- A. At the end of construction, the design team will provide to the contractor a complete set of CAD file(s) with all the plan adjustments (bulletins and sketches produced by the design team) fully incorporated into the base CAD file(s). This shall happen within 14 days of substantial completion.
- B. The contractor will coordinate the process to take all field changes/adjustments (site "red-lines") by all subcontractors and add these changes accurately to the CAD file(s). All hand-drawn SKs that are not included in the design team's electronic update must be added to the CAD file(s) by the contractor. This shall happen within 21 days of receipt of updated electronic files from the design team.
- C. The contractor will also include any electronic "MEP coordination drawings" produced by the construction team in the final electronic as-built drawing issue. The coordination drawings shall not replace any of the original contract drawings, and they shall be fully labeled to demonstrate the area of the building shown and identify all elements depicted on the plan. If abbreviations are used, a key must be included on these plans. This shall happen within 21 days of receipt of updated electronic files from the design team.
- D. The contractor will ensure that all notes and schedules included in the design drawings are updated to accurately reflect actual installed conditions. This shall happen within 21 days of receipt of updated electronic files from the design team.
- E. Review and Approval
  - 1. The contractor will print hard copies of the draft as-built package (with all items noted in 1.2) and send a copy to each of the major design consultants, the owner's representative and the commissioning agent within 21 days of receipt of updated electronic files from the design team.
  - 2. All design team/owner comments/mark-ups on the draft package shall be returned to the contractor within 21 days, and the contractor shall then make the required corrections on the electronic set within 21 days of receipt.
  - 3. A hard copy of the full corrected set will then be sent to the owner's rep for final approval.
  - 4. After approval, the electronic set will be given to the owner's rep.

- F. CAD files shall conform to the Brown University CAD deliverable guidelines.  
Survey work shall conform to Brown University survey control standards.
- A. Final approved as-built drawings for all systems and trades
- B. Provide and install framed charts in appropriate building MEP rooms for one line diagrams, process flow diagrams and valve charts. Existing charts shall be updated where necessary
- C. Software: Provide copies of system software and device configuration files for all electronic systems installed under the project. Files to be provided on formatted CD, mass storage device or other acceptable media. Include applicable software documentation and user manuals. Systems requiring software backup include but are not limited to:
  - 1. Building Automation Systems (BAS)
  - 2. Fire Alarm Systems and Smoke Control Systems
  - 3. Elevator Controls
  - 4. Lighting Controls
  - 5. Door Access Control Systems
  - 6. Any other system containing application specific programming

### 1.3 START UP AND DEMONSTRATIONS FOR EQUIPMENT AND SYSTEMS: CONTROLS' TRAINING EARLY

- A. Provide training and demonstrations of the equipment and sequences of systems operation to operations department staff
- B. Submit proposed training plan for review using the submittal process at least 15 days prior to scheduling training sessions
- C. Training and demonstrations to include the following in conjunction with designated operations personnel:
  - 1. Operate the equipment and systems for a minimum of two hours or five repetitions, or as otherwise required. If problems occur, correct them and repeat the full demonstration
  - 2. Demonstrate proper equipment and systems operation, as well as procedures for cleaning, lubrication, maintenance, replacement of routine expendable parts and all other actions required for normal operations and maintenance.
  - 3. Demonstrate and review both normal and failure modes of system controls operation where they are designed as such
  - 4. Review O&M manuals
  - 5. Place systems into full operation

### 1.4 FINAL PROJECT TURNOVER TO OPERATIONS DEPARTMENT

- A. At the time of substantial completion, the contractor shall coordinate with the Brown University project manager to schedule a project turnover meeting. This meeting shall include the Brown University project manager, contractor, sub-contractors,

architect/engineers (if applicable) and Brown operations and engineering representatives.

- B. At the meeting, an overview of the project will be followed via a PowerPoint presentation to be initiated by Brown University and completed by the contractor.
- C. Commissioning Review: The project commissioning agent's final report detailing their findings, recommendations, and summary of any open issues shall be made available and reviewed in the course of the project turnover meeting(s).

## 1.5 PROJECT WARRANTY

- A. At substantial completion of all work as certified by the owner and architect/engineer, the contractor shall deliver a Letter of Warranty to the owner. This warranty certifies that the contractor shall promptly replace or repair any defects in equipment, materials or workmanship that becomes apparent within one (1) year from the date of substantial completion, or owner's acceptance of the project, whichever is later.
- B. The warranty shall include repairs and corrections to pipe covering, paint, woodwork, or any other material and equipment caused to be imperfect due to defective workmanship or materials. All direct and consequential repairs shall be entirely at the expense of the contractor.
- C. Additional manufacturers' extended warranties for major equipment shall be supplementary to this guarantee.