

## **SECTION 23 08 10 – COMMISSIONING: FUNCTIONAL PERFORMANCE TESTING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. The purpose of functional performance testing (FPT) is to assure the Owner that all work has been completed as specified and that systems are functioning in the manner intended, within the limits of the design and the Contract Documents. It will serve as a tool to minimize post-occupancy systems operational difficulty or failure. It will assist operations staff familiarization and training with new systems. It will also be used to develop test protocols and record associated test data in an effort to advance the building systems from a state of substantial completion to full dynamic operation.
- B. Functional performance testing shall commence as systems are brought to Substantial Completion and shall be done on a system-by-system basis. The results of these tests shall be documented and handed over to the Commissioning Authority and Owner's Representative for final system acceptance.
- C. Substantial Completion requires that:
  - 1. All testing be complete and approved.
  - 2. O&M manuals are complete (not in process).
  - 3. All training is complete.

#### **1.2 SYSTEMS TO BE TESTED**

- A. FPT shall be performed on the following systems:
  - 1. HVAC
    - a. Air Handling System
    - b. Exhaust System
    - c. Lab Air System Terminal Equipment
    - d. Heating Hot Water System (pumps, coils)
    - e. Central Cooling Water System (pumps, coils)
    - f. Process Chilled Water System (chillers, towers, pumps)
  - 2. Controls
    - a. Environment Control System
    - b. Energy Conservation System
    - c. Sensors
    - d. Setpoints and calibration
    - e. Control loop strategy and function

3. Life Safety and Building Protection

- a. Smoke and fire control systems and components
- b. Stair and elevator pressurization systems

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor and subcontractors shall be responsible for performing all procedures presented in the specification and contract drawings, unless otherwise specified. The Test Engineer and Commissioning Authority shall witness system start up and functional performance for all systems listed in this division.

3.2 FUNCTIONAL PERFORMANCE TESTING

- A. Functional performance testing begins after the systems have been completed by the contractors, the system description and training sessions have been completed, and the O&M manuals have been completed.
- B. The objective of functional performance testing is to advance the building systems from a state of substantial completion to full dynamic operation in accordance with the specified design requirements and design intent.
- C. The Test Engineer shall attain this objective by developing individual system-testing protocols which, when implemented by the Contractor, will allow the Test Engineer to observe, evaluate, identify deficiencies, recommend modifications, tune, and document the systems and systems' equipment performance over a range of load and functional levels.
- D. The UW has examples of test procedure check-off sheets. They are not tailored to this facility. The Test Engineer shall use these examples as the format for developing test procedure check-off sheets for all equipment and systems specific to this facility and submit them to the Commissioning Authority and Owner's Representative for approval.

**END OF SECTION 23 08 00**