This master should be used by designers working on Port of Portland construction projects and by designers working for PDX tenants (“Tenants”). Usage notes highlight a few specific editing choices, however the entire section should be evaluated and edited to fit specific project needs.

SECTION 230590 - PRESSURE TESTING OF HVAC SYSTEMS

1. GENERAL
   * + 1. DESCRIPTION
          1. This section describes pressure testing of piping and ductwork systems.
       2. RELATED WORK SPECIFIED ELSEWHERE
          1. Section 230518, Expansion Compensation
          2. Section 232100, Underground Hydronic Piping
       3. SUBMITTALS
          1. Submit the following:

Test plan and schedule: For piping and ductwork systems.

Test Reports:

Certificate of completion, inspection, and test by authority having jurisdiction on required piping systems.

Certificate of test approval to the Port on all systems.

Use only if Section 019100, General Commissioning Requirements, is included in the contract.

Coordinate with commissioning plan and schedule.

* + - 1. QUALITY ASSURANCE
         1. Code Compliance: Perform required tests in the presence of the authority having jurisdiction.
         2. Port Witness: Perform all tests in the presence of the Port.
         3. Simultaneous Testing: Test observations by the authority having jurisdiction and the Port need not occur simultaneously.

1. PRODUCTS

Not Used.

1. EXECUTION
   * + 1. GENERAL
          1. Piping: Test prior to concealment, insulation being applied, and connection to equipment, fixtures, or specialties.
          2. Ductwork: Test prior to connection to equipment and before applying insulation.
          3. Leaks: Repair all leaks and retest until stipulated results are achieved.
          4. Notification: Provide the Port 48 hours notice in advance of each test. Failure to so notify will require test to be rescheduled.
          5. Testing Equipment: Provide all necessary pumps, gauges, connections and similar items required to perform the tests.
          6. Pneumatic Leakage Testing: At the Contractor’s option and as approved by the Port, pneumatic leakage testing prior to hydronic pressure testing or system filling is permitted with a maximum air pressure of 5 psig. This does not replace requirements for hydronic pressure testing at a higher pressure specified herein. Pneumatic testing of plastic piping is not permitted unless approved by the Port.
       2. TESTING REQUIREMENTS
          1. Medium Pressure Ductwork:

Test all square duct systems and 50 percent of oval and spiral duct systems at 4-inch static pressure, using a testing machine.

Maximum allowable leakage percentage is defined as CFM air leakage per cubic foot volume of duct section tested. This is not percentage of design air flow. Leakage shall not be greater than 10 percent of duct volume per minute.

* + - * 1. Piping: Test all piping as noted below, with no leaks or loss in pressure for time indicated. Repair or replace defective piping until tests are completed successfully:

| System | Test Pressure | Test  Medium | Test  Duration |
| --- | --- | --- | --- |
| Chilled water | 150 psig | water | 4 hours |
| Heating water | 150 psig | water | 4 hours |
| Condenser water | 150 psig | water | 4 hours |
| Steam and condensate | 100% of system-design pressure | water | 4 hours |
| Glycol | 150 psig | water | 4 hours |
| Refrigerant piping | 300 psig | nitrogen | 4 hours |

* + - * 1. Prefabricated Piping Systems: Test in accordance with the requirements of Section 232100.
        2. Piping Systems with Expansion Compensation: Test in accordance with the requirements of Section 230518.

END OF SECTION 230590