

SECTION 23 99 50

TESTING AND BALANCING AIR SYSTEMS

PART ONE - GENERAL:

1.01 SCOPE:

- A. The Mechanical Contractor shall employ an independent testing and balancing firm specializing in total system testing and balancing. The balancing firm shall be a member of the Associated Air Balance Council (AABC) or certified by the National Environmental Balancing Bureau (NEBB). The balancing firm shall provide all labor, equipment, engineering and test equipment required to test, adjust, and balance all heating, ventilating, air-conditioning, and exhaust systems as hereinafter specified.
- B. Approved Testing and Balancing Firms are:
 - 1. TAB Services, Inc. – Atlanta, GA
 - 2. Phoenix Agency, Inc. - Winston-Salem, NC
 - 3. Palmetto Air and Water – Greer, SC

PART TWO - PRODUCTS AND EXECUTION:

2.01 The balancing contract shall incorporate the following:

- A. Adjust and balance the complete mechanical system.
- B. Upon completion of the air handling systems, the Contractor shall have the balancing firm perform the following tests and compile the following information of each item of equipment and submit four bound copies of this information to the Architect for approval.

2.02 All medium pressure ducts shall be duct air leak tested with less than 5% leakage prior to insulation.

2.03 All test equipment will be furnished by the Balancing Contractor and will remain his property. All instruments will have been calibrated within the last month.

2.04 The Balancing Firm will warrant solely that the system will be set to within 10% of the values as established by the plans and specifications and also adjust to minimize drafts in all areas.

2.05 Any changes that are required for the final balancing results as determined by the Balancing Contractor will be provided by the respective Contractors who are to supply and install such equipment under their contractual obligations. Such changes may encompass, but not necessarily restricted to, the changing of pulleys, belts, dampers, or adding dampers or access panels.

2.06 BALANCING PROCEDURE (AIR):

- A. Before starting air balance, check the following items:
 - 1. Check air filters to be sure they are clean and in position.
 - 2. Check for proper belt tension and alignment.
 - 3. Check fan and motor lubrication.
 - 4. Check motor overload protectors or heaters for proper size.
 - 5. Check for proper rotation.
- B. Measure supply air volumes by means of the duct traverse method, taking a minimum of sixteen (16) readings. Seal duct access holes with metal snap-in-plugs. The use of duct tape to seal access holes will not be permitted.
- C. Adjust balancing dampers for required branch duct air quantities. Dampers shall be permanently marked after air balance is complete.
- D. Adjust grilles and diffusers to within 10% of individual requirements specified, and also adjust so as to minimize drafts in all areas.
- E. The total air delivery in any particular fan system shall be obtained by adjustment of the particular fan speed.
- F. The drive motor of each fan shall not be loaded over the corrected full load amperage rating of the motor involved.
- G. All duct systems are to be balanced for lowest static pressure and lowest fan speed possible to deliver required air quantity.
- H. Unless otherwise noted, adjust quantity of return air from space to pass 90% of air supplied to space.
- I. Where splitter and volume dampers have been provided for balancing of air in ducts, balancing shall be done with register and diffuser volume dampers as fully open as possible.
- J. Do not operate fans during times when construction process or cleaning would allow dirt or rubbish to accumulate in the system.

2.07 CERTIFICATION:

Furnish to the Architect/Engineer two copies of the following data, signed by an authorized representative of the balancing firm who is a Registered Professional Engineer:

- A. Air System Data:
 - 1. Room
 - 2. Supply or Return Size
 - 3. Design CFM

4. Measured CFM
5. Percent of Design CFM
6. Equipment: (Air handling units and exhaust fans)
 - a.) Installation Data:
 - 1 - Manufacturer and model
 - 2 - Size
 - 3 - Arrangement, discharge, and class
 - 4 - Motor HP, voltage, phase, cycle, and full load amps
 - 5 - Location and local identification data
7. Design Data: (Data listed in schedules on drawings and specifications)
 - a.) Recorded (test) Data:
 - 1 - CFM
 - 2 - Static pressure
 - 3 - RPM
 - 4 - Motor operating amps
 - 5 - Motor operating B.H.P.

B. Water System Data:

1. Air Heating and Cooling Equipment:
 - a.) Design Data:
 - 1 - Load in BTUH or MBh
 - 2 - CFM
 - 3 - Entering and leaving water temperatures
 - 4 - Entering and leaving air conditions (D.B. and W.B.)
 - 5 - GPM
 - 6 - Water pressure drop
 - b.) Recorded Data:
 - 1 - Load in BTUH or MBh
 - 2 - CFM
 - 3 - Entering and leaving water temperatures
 - 4 - Entering and leaving air conditions (D.B. and W.B.)
 - 5 - GPM
 - 6 - Water pressure drop

2.08 FINAL AIR BALANCE:

- A. Perform final air balance after building is occupied. On final air balance adjust air quantities as required to maintain space temperatures in building at design conditions plus or minus 2 degrees F. Submit data sheets on recorded temperatures. Indicate

time of day and outdoor temperature on data sheets.

- B. A preliminary Test and Balance Report shall be issued to the Mechanical Contractor and Engineer prior to the issuance of the final Testing and Balancing Report outlining all deficiencies in the installed system. These listed deficiencies shall be corrected and/or resolved prior to finalizing the Test and Balance Report.

END OF SECTION