

SECTION 230590

HVAC TESTING - ADJUSTING - BALANCING

PART 1 GENERAL

1.1 STIPULATIONS

- A. The General Conditions, drawings and all other attached documents form a part of this Section and all other Sections by reference thereto and have the same force and effect as if printed herewith in full. The Contractor shall be strictly accountable for the cognizance of carrying out the provisions thereof.

1.2 GENERAL

- A. This Contractor shall employ a qualified independent engineering testing firm as listed by the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB) to execute all balancing operations on heating, ventilating, and air conditioning systems.
- B. The firm shall specialize in the field adjusting of heating and air conditioning systems, and shall not be associated with mechanical contractors, design engineering or equipment manufacturers or representatives.

PART 2 PRODUCTS

2.1 GENERAL

- A. The agency or company must have operated as an independent test and balance agency for a period of not less than five (5) years immediately prior to the project issue for bid. During this five-year period, the agency must have continuously performed testing and balancing work as an agency - not as an individual.
- B. The agency must have an established place of business, separate and distinct from a home or residence.
- C. The applicant must maintain properly equipped and staffed facilities that are capable of compiling and distributing appropriate reports and data established from field measurements. These facilities must also be capable of furnishing the Professional with completely reliable documentation of system information.
- D. The agency must own the equipment necessary to perform the specified work herein.

2.2 REQUIRED BASIC INSTRUMENTATION

- A. The agency or company must own the listed basic instrumentation.
- B. All equipment and instrumentation must be in good working order, tested and certified to be in correct calibration by an independent organization traceable to the National Bureau of Standards.
- C. Hydronic Differential Pressure Gauges
 - 1. 0 to 50 inches WG
 - 2. 0 to 100 inches WG

3. 0 to 30 feet of water (or greater)

D. Anemometers

1. Rotating Vane
2. Deflecting Vane

E. Tachometer

1. Chronometric type

F. Pitot Tubes

1. 0 to 18"
2. 0 to 24"
3. 0 to 36"
4. 0 to 48"
5. 0 to 60"

G. Electric Meters

1. Portable volt-amp meter
2. Power factor meter

H. Flow Hood

I. Smoke Set

1. Gun
2. Candles

J. Sound Pressure Meter with Octave Band Analyzer

K. Thermometers

1. Glass stem
2. Dial
3. Pyrometer
4. Digital
5. Recording

L. Manometers

1. 0 to 10" inclined and vertical scale

2. 0 to 1" inclined scale
3. 0 to 0.25" inclined scale (0.005" increments)
4. 18" U-tube

M. Bourbon Tube Gauges

1. -30 Hg to 30 psi
2. 0 to 60 psi
3. 0 to 150 psi
4. 0 to 300 psi
5. Test gauge to verify other gauges

N. Air Differential Pressure Gauges (Magnetic Linkage)

1. 0 to 0.5" WG
2. 0 to 1.0" WG
3. 0 to 2.0" WG
4. 0 to 4.0" WG
5. 0 to 8.0" WG

2.3 CERTIFIED TEST AND BALANCE ENGINEER/TECHNICIAN QUALIFICATIONS

A. Engineer

1. The applicant must have in its employ, on a full-time basis, at least one AABC or NEBB Certified Test and Balance Engineer.
2. The person who is certified by AABC or NEBB as a Test and Balance Engineer must meet the following qualifications:
 - a. Education: The applicant must have submitted a resumé of educational background which has been approved as satisfactory by AABC and/or NEBB.
 - b. Experience:
 - (1). Not less than ten years test and balance experience.
 - (2). Five years of this must have been in continuous field experience in actual testing and balancing work. In addition, the applicant must pass the AABC examination for certification or accepted equivalent.

B. Test and Balance Technician Qualifications

1. The technician who is approved as an AABC or NEBB Qualified Test and Balance Technician must meet one of the following requirements:
 - a. Five years experience in Testing and Balancing and pass an AABC qualifying test or accepted equivalent.
 - b. Completion of the AABC Testing and Balancing Technician Apprentice Program and pass the AABC qualifying test or accepted equivalent.

PART 3 EXECUTION

3.1 GENERAL

- A. The firm shall employ a Professional Engineer registered in the Commonwealth of Pennsylvania who shall supervise the work. Said firm shall perform the following functions:
 1. Execute and forward to the consulting engineer a copy of a Warranty Certificate. Said certificate shall simultaneously be filed with this Contractor and the Professional and shall be a binding part of this Agreement.
 2. Execute the balancing of the air conditioning and ventilating systems to achieve appropriate air quantities at the appropriate terminals. (Recirculating hood systems shall be tested, balanced and adjusted for proper operation.)
 3. Check and calibrate new space thermostats in the renovated areas] for proper control.
 4. Enlist the cooperation of respective equipment manufacturers as necessary to achieve proper performance.
 5. All systems shall be balanced to within 10% of listed values. If balancer is unable to achieve these numbers, a report as to possible issues shall accompany the balancing report.
 6. Study and report any problem concerning noise which may develop in the course of system balancing.
- B. When work is complete, the firm shall report the results of the balancing and adjusting to the Professional on suitable forms, consistent with the requirements of the Professional. The Contractor shall supply six (6) copies of all balancing reports to the Professional for review.
- C. All of the work shall be performed in accordance with the National Standards for Field Measurements and Instrumentation -Total System Balance Volume 1 of the Associated Air Balance Council. In addition, the balancing firm shall recheck any specific terminals at the request of the Professional within the first year of operation.

END OF SECTION