

PART 1 - GENERAL

- 1.1 QUALIFICATIONS  
OF TAB PERSONNEL
- .1 Submit names of personnel to perform TAB to Departmental Representative within 90 days of award of contract.
  - .2 Provide documentation confirming qualifications, successful experience.
  - .3 TAB: performed in accordance with the requirements of standard under which TAB Firm's qualifications are approved:
    - .1 Associated Air Balance Council, (AABC) National Standards for Total System Balance, MN.
    - .2 National Environmental Balancing Bureau (NEBB) TABES, Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems.
    - .3 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), HVAC TAB HVAC Systems - Testing, Adjusting and Balancing-Latest Edition.
  - .4 Recommendations and suggested practices contained in the TAB Standard: mandatory.
  - .5 Use TAB Standard provisions, including checklists, and report forms to satisfy Contract requirements.
  - .6 Use TAB Standard for TAB, including qualifications for TAB Firm and Specialist and calibration of TAB instruments.
  - .7 Where instrument manufacturer calibration recommendations are more stringent than those listed in TAB Standard, use manufacturer's recommendations.
  - .8 TAB Standard quality assurance provisions such as performance guarantees form part of this contract.
    - .1 For systems or system components not covered in TAB Standard, use TAB procedures developed by TAB Specialist.
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- 1.1 QUALIFICATIONS .8 (Cont'd)  
OF TAB PERSONNEL  
(Cont'd)
- 1.2 PURPOSE OF TAB .1 Test to verify proper and safe operation,  
determine actual point of performance,  
evaluate qualitative and quantitative  
performance of equipment, systems and controls  
at design, average and low loads using actual  
or simulated loads
- .2 Adjust and regulate equipment and systems to  
meet specified performance requirements and to  
achieve specified interaction with other  
related systems under normal and emergency  
loads and operating conditions.
- .3 Balance systems and equipment to regulate  
flow rates to match load requirements over  
full operating ranges.
- 1.3 EXCEPTIONS .1 TAB of systems and equipment regulated by  
codes, standards to satisfaction of authority  
having jurisdiction.
- 1.4 CO-ORDINATION .1 Schedule time required for TAB (including  
repairs, re-testing) into project construction  
and completion schedule to ensure completion  
before acceptance of project.
- .2 Do TAB of each system independently and  
subsequently, where interlocked with other  
systems, in unison with those systems.
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- 1.5 PRE-TAB REVIEW .1 Review contract documents before project construction is started and confirm in writing to Departmental Representative adequacy of provisions for TAB and other aspects of design and installation pertinent to success of TAB.
- .2 Review specified standards and report to Departmental Representative in writing proposed procedures which vary from standard.
- .3 During construction, co-ordinate location and installation of TAB devices, equipment, accessories, measurement ports and fittings.

- 1.6 START-UP .1 Follow start-up procedures as recommended by equipment manufacturer unless specified otherwise.
- .2 Follow special start-up procedures specified elsewhere in Division 23.

- 1.7 OPERATION OF SYSTEMS DURING TAB .1 Operate systems for length of time required for TAB and as required by Departmental Representative for verification of TAB reports.

- 1.8 START OF TAB .1 Notify Departmental Representative 7 days prior to start of TAB.
- .2 Start TAB when building is essentially completed, including:
- .3 Installation of ceilings, doors, windows, other construction affecting TAB.
- .4 Application of weatherstripping, sealing, and caulking.
- .5 Pressure, leakage, other tests specified elsewhere Division 23.
- .6 Provisions for TAB installed and operational.
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- 1.8 START OF TAB      .7      Start-up, verification for proper, normal and  
    (Cont'd)
- .1      Proper thermal overload protection in  
    place for electrical equipment.
- .2      Air systems:
- .1      Filters in place, clean.
- .2      Duct systems clean.
- .3      Ducts, air shafts, ceiling plenums  
        are airtight to within specified  
        tolerances.
- .4      Correct fan rotation.
- .5      Fire, smoke, volume control dampers  
        installed and open.
- .6      Coil fins combed, clean.
- .7      Access doors, installed, closed.
- .8      Outlets installed, volume control  
        dampers open.
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- 1.9 APPLICATION      .1      Do TAB to following tolerances of design  
    TOLERANCES      values:
- .1      HVAC systems: plus 5 %, minus 5 %.
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- 1.10 ACCURACY      .1      Measured values accurate to within plus or  
    TOLERANCES      minus 2% of actual values.
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- 1.11 INSTRUMENTS      .1      Prior to TAB, submit to Departmental  
                            Representative list of instruments used  
                            together with serial numbers.
- .2      Calibrate in accordance with requirements of  
        most stringent of referenced standard for  
        either applicable system or HVAC system.
- .3      Calibrate within 3 months of TAB. Provide  
        certificate of calibration to Departmental  
        Representative.
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| <u>1.12 ACTION AND<br/>INFORMATIONAL<br/>SUBMITTAL</u> | .1 | Submit, prior to commencement of TAB:   |
|  | .2 | Proposed methodology and procedures for performing TAB if different from referenced standard.   |
| <br><u>1.13 PRELIMINARY<br/>TAB REPORT</u>             | .1 | Submit for checking and approval of Departmental Representative prior to submission of formal TAB report, sample of rough TAB sheets. Include:<br>.1 Details of instruments used.<br>.2 Details of TAB procedures employed.<br>.3 Calculations procedures.<br>.4 Summaries. |
| <br><u>1.14 TAB REPORT</u>                             | .1 | Format in accordance with referenced standard.  |
|  | .2 | TAB report to show results in SI units and to include:<br>.1 Project record drawings.<br>.2 System schematics.  |
|  | .3 | Submit 3 copies of TAB Report and 1 electronic copy to Departmental Representative for verification and approval, in English in D-ring binders, complete with index tabs.   |
| <br><u>1.15 VERIFICATION</u>                           | .1 | Reported results subject to verification by Departmental Representative.  |
|  | .2 | Provide personnel and instrumentation to verify up to 30 % of reported results.   |
|  | .3 | Number and location of verified results as directed by Departmental Representative.   |
|  | .4 | Pay costs to repeat TAB as required to satisfaction of Departmental Representative.   |
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1.16 SETTINGS .1 After TAB is completed to satisfaction of Departmental Representative, replace drive guards, close access doors, lock devices in set positions, ensure sensors are at required settings.

.2 Permanently mark settings to allow restoration at any time during life of facility. Do not eradicate or cover markings.

1.17 COMPLETION OF TAB .1 TAB considered complete when final TAB Report received and approved by Departmental Representative.

1.18 AIR SYSTEMS .1 Standard: TAB to most stringent of this section or TAB standards of NEBB SMACNA.

.2 Do TAB of systems, equipment, components, controls specified Division 23 following systems, equipment, components, controls:

- .1 Rooftop exhaust fan (EF-1).
- .2 Makeup Air Unit (MUA-1).

.3 Qualifications: personnel performing TAB current member in good standing of NEBB.

.4 Quality assurance: perform TAB under direction of supervisor qualified by NEBB.

.5 Measurements: to include as appropriate for systems, equipment, components, controls: air velocity, static pressure, flow rate, pressure drop (or loss), temperatures (dry bulb, wet bulb, dewpoint), duct cross-sectional area, RPM, electrical power, voltage, noise, vibration.

.6 Locations of equipment measurements: to include as appropriate:

- .1 Inlet and outlet of dampers, filter, coil, fan, other equipment causing changes in conditions.
- .2 At controllers, controlled device.

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- 1.18 AIR SYSTEMS .7 Locations of systems measurements to include  
(Cont'd) as appropriate: main ducts, main branch,  
sub-branch, run-out (or grille, register or  
diffuser), areas where two unit air streams  
combine.
- 1.19 OTHER TAB .1 General requirements applicable to work  
REQUIREMENTS specified this paragraph:  
.1 Qualifications of TAB personnel: as for  
air systems specified this section.  
.2 Quality assurance: as for air systems  
specified this section.
- .2 Smoke management systems:  
.1 Test for proper operation of all smoke  
and fire dampers, sensors, detectors, installed  
as component parts of air systems specified  
Division 23.
- 1.20 POST-OCCUPANCY .1 Measure DBT, WBT (or %RH), air velocity in  
TAB occupied zone of following areas: kitchen.

## PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not used.

## PART 3 - EXECUTION

- 3.1 NOT USED .1 Not used.