

SECTION 15855 – "AIR HANDLING UNITS"

- 1.0 Refer to Section 15790 for design standards relating to coils integral with air handling units. Size all air handling unit (AHU) system components and duct mains to allow for future expansion and renovations in accordance with specific criteria furnished by the Office of the University Engineer. Acceptable manufacturers are: York, McQuay, Trane.
- 2.0 All units should be floor mounted within Mechanical Rooms. Ceiling mounted and rooftop units are strongly discouraged. Any necessary deviation from this standard dictated by site conditions, shall be reviewed and pre-approved by the Office of the University Engineer.
- 3.0 Each air handling unit shall be provided with a filter section(s) capable of housing the filters specified in Section 15885 and a mixing box designed to prevent stratification. If mixing of air cannot be assured due to unit configuration, the use of an air blender section should be considered. All dampers and actuators shall be fully accessible for lubrication.
- 4.0 Units shall have the following construction features:
 - A. Reinforced galvanized steel panels.
 - B. Removable access panels shall be provided where required to facilitate removal of components (e.g. coils, fans, motors). Access doors shall be provided where required for maintenance. All access doors, as well as any access panels in excess of 40 Lbs., shall be hinged, gasketed and provided with non-locking lever type handles. Access doors shall be approximately 20 inches wide by full height of casing or maximum of 60 inches. Swing doors against the air pressure.
 - C. Filter section access doors shall be piano hinged.
 - D. All sections shall be double wall construction and insulated with a minimum of 1" 1-1/2 lb. Insulation (foam filled preferred). The use of single wall construction is prohibited.
 - E. Drain pans shall be double wall and constructed of welded stainless steel with 1" 3/4 lb. insulation sandwiched between the pans. Drain pans shall be sloped to drain connections per ASHRAE Standard 62-2001 (and its approved addenda). Intermediate drain pans shall be used for stacked coils.
 - F. Coil sections shall be provided with tracks, extended the full length of the unit to provide for the removal of the coil or an individual coil in a bank of coils.

- G. Fans shall be double width, double inlet (DWDI) centrifugal type fans. The Engineer shall select the most efficient fan available (i.e. airfoil, forward curved, backward inclined).
 - H. Fan sections, where possible, shall employ airfoil fans with a minimum ACMA Construction Class of II. Use Class III fan construction if the fan characteristic curve extends to within 10% of the fans Class III selection zone.
 - I. Fan bearings are to be self-aligning, pillow block, regreaseable ball bearings rated for an average life of L-10 200,000 Hrs. All units shall be provided with extended copper lubrication lines to allow lubrication from the exterior of the unit.
 - J. Fan shafts and fans shall be rated for continuous operation and shall be statically and dynamically balanced in all plains. Fan drives shall be selected for a 1.5 service factor.
- 5.0 All units in excess of 2,000 CFM must be provided with a return air fan (for return air systems). The return air fan can be a single width single inlet centrifugal fan set, integral or independent cabinet fan, or in-line centrifugal type fan and must be mounted to permit servicing without the use of a ladder. Units which are not floor mounted and are mounted in excess of 6'-0" above the floor must be provided with stable catwalks constructed of structural grade steel and steel grating. Access ladders shall be integral with the catwalk.
- 6.0 Fans serving variable air volume systems shall be provided with a variable frequency drive (VFD). (Refer to Section 15170 for VFD motor requirements and 16483 for VFD requirements). Inlet vanes, discharge dampers, are not permitted.
- 7.0 **All damper motors and actuators shall be located outside of the unit casing and be fully assessable for removal and repair.**
- 8.0 The Engineer will ascertain that adequate service space exists for the removal of coils, fans, fan shafts etc. without disturbing surrounding equipment. Piping drops to AHU coils shall be arranged to facilitate coil removal without removing large sections of pipe.
- 9.0 Field erected air handling units must meet the above requirements and shall be constructed in accordance with SMACNA standards. Integral unit fans or independent fan sets may be used.
- 10.0 The Engineer will review the noise and vibration levels of the units and provide isolation equipment as required to meet acceptable levels. **Sound attenuators shall be provided where fan noise will be transmitted to interior spaces or exterior areas in excess of**

the levels permitted in Section 15500 for interior spaces. On a project by project basis, exterior installations of fans shall be evaluated against local site noise level goals and criteria. Refer to Part I, General Section XI.

- 11.0 Safety control components such as firestats, smoke detectors and/or smoke dampers shall be provided per code requirements.
- 12.0 Central station units shall be designed to function as a smoke removal system in all buildings required by code to contain such.
- 13.0 Multiple fans provided in AHUs and exhaust fans for redundancy purposes shall be provided in separate compartments with inlet out outlet manual isolation dampers to facilitate maintenance without taking the unit out of service.
- 14.0 The design of fan inlet and outlet conditions should consider the impact of system effects on the fan performance. Where possible, follow the recommendations shown in SMACNA Duct Design Manual for fan inlet and outlet arrangements.

END OF SECTION