SECTION 23 70 00

CENTRALIZED HVAC EQUIPMENT

PART 1: GENERAL

1.1 PURPOSE

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 **LESSONS LEARNED AND DESIGN CONSIDERATIONS**

A. Ensure equipment pad is high enough to accommodate condensate trap with proper slope and without cutting into mechanical room floor. **Make a detail for the condensate trap showing the dimensions for each air handler.**

B. Prefer fan array/matrix type system for supply and return fans. Fan motor size should be a maximum of 7.5 HP.

C. Locate VFD's on the same side as the coil piping is located.

D. All handles on air handler doors will be Ventlok 310 heavy duty door latch or equivalent. No plastic handles will be allowed.

E. No piano hinges allowed on access doors. Heavy duty butt hinges are required. Minimum 2 hinges for doors that are 18 inches or less. Minimum of three door hinges are required for doors greater than 18 inches in height..

F. Control valves will be installed in the main coil piping. Bypasses will be installed around the control valve.

G. Humidity sensors will be located 125% farther than the designed entrainment distance of the dispersion tubes.

H. Duct mounted humidifiers will be completely designed prior to 100% CD drawings with number and dimensions of dispersion tubes.

I. Humidifiers will have chemical treatment equipment designed for the humidifier.

J. Minimum 36 inches of clear access of service side of air filters.

K. Air Handling Units located on the roof will have the chilled water and heating water or steam piping routed beneath the unit or in an enclosure next to the unit. These utility pipes will not be routed across the roof and exposed to the outdoors.

L. Eliminate or minimize the need for heat tracing systems.

M. Location of freezestat wire will be after the preheat coil and before the chilled water coil.

N. Location of air temperature sensors will be where they are sensing the main airflow in the unit section. Do not place sensors in corners or anywhere the airstream could be stagnant. Ensure design mixes outside air and return air completely before temperature sensors or freezestats.

O. Do not install isolation valves on condensate drain lines.

P. For large units with service vestibules provide proper steel stairs and light above access door.

Q. Opposed blade dampers should be specified.

R. Chilled water cooling coil maximum velocity will be 500 fpm.

S. Filter change out pressure drop will be used to size supply/return fans not clean filter pressure drop.

T. Drain pans will be insulated.

U. Direct drive fans are preferred over belt driven fans.

V. Design heating and cooling coils to be more easily removed for coil removal and replacement.

W. 5/8" OD copper tubes with copper or aluminum fins for all coils.

PART 2 - PRODUCTS

2.1 GENERAL

A. This product section is intended to inform the PSP on the minimum standard of quality that should be incorporated in new designs. The PSP should evaluate these standards and incorporate or make additional requirements per project specific requirements. Where the PSP considers any requirement listed not to be applicable or incompatible with the project design intent should be discussed with UTA Office of Facilities Management.

B. **Manufacturers**:

1. Temptrol

2. Governair

3. Trane

C. Unit Casings

1. Outer casings will be a minimum of 16 GA galvanized steel and inner casing a minimum of 18 gauge galvanizes steel.

2. Insulation will be internally contained in casing wall with minimum R-16 insulation. Insulation should be designed for the specific project and conditions to prevent condensation on the outside surfaces of the unit including the floor and roof.

3. Airstream surfaces will comply with ASHRAE 62.1.

4. Panels will have a maximum deflection of L/250th of the overall panel width or height.

5. Panel construction will have the following minimum acoustical performance. Designers will provide additional acoustical requirements for specific project designs.

Sound Transmission Loss (dB) per ASTM E-90						
Octave	2	3	4	5	6	7
Solid Liner	22	38	49	50	57	62

Sound Absorption Coefficients per ASTM C-423						
Octave	2	3	4	5	6	7
Solid Liner	0.25	0.79	1.06	1.06	1.04	0.78

D. Access Doors

1. Insulated panels with same construction as walls of unit.
2. Doors to open against air pressure.
3. **Butt hinges, minimum 3 per access door for doors greater than 18 inches in height.**
4. **Ventlok 310 heavy duty door latch or equivalent**.
5. Gasket around entire door frame.
6. Windows for each section will be double-glazed, wire reinforced safety glass.

E. Condensate Drain Pans

1. Minimum 1% slope to collect condensate from cooling coils. On units that are greater than 6 feet wide the drain pan will be sloped in two directions.
2. Minimum 2 inches deep.
3. Minimum condensate pipe size is NPS 1.
4. 14 GA Stainless steel material.
5. Stacked coils will have an intermediate drain pan to collect condensate from top coil.

F. Fan, Drives and Motors

1. **Multi fan arrangement. For larger units with at least four fans provide one redundant fan so if one fan fails the AHU can produce design capacity.**
2. Plenum type, direct drive with non-overloading backward inclined fan wheel.
3. **VFD's will be ABB or Yaskowa. One VFD for each fan array with a 100% redundant backup VFD that will switch over automatically upon failure of running VFD.**
4. Provide a single point of electrical connection for all electrical loads for the unit.

G. Coils

1. Coils will be individually removable and not be part of the structure of the unit.
2. **5/8" OD copper with aluminum or copper fins**.
3. **Maximum 12 fins per inch and maximum 6 row coils on cooling coils and maximum 2 row on heating coils.**

H. Dampers

1. **All dampers located within the air handler unit will be supplied by the air handler manufacturer**.
2. Damper leakage will be maximum 4CFM/sqft at 4 inwg.
3. Maximum face velocity will be 1800 fpm.

PART 3 - EXECUTION

3.1 Test access doors and verify purpose of access door can be performed.

3.2 Test all manual dampers to full range of motion.

3.3 Startup Service:

A. Complete startup checks according to manufacturer's instructions.

B. Verify shipping bracing/blocking is removed.

C. Verify duct and piping connections to air handling unit are secure and not supported by the AHU.

D. Verify all lubrication points have been services prior to startup.

E. Verify all dampers open and close fully without binding and all linkages are adjusted..

F. Install clean filters.

G. Verify volume, smoke and fire dampers are in the fully open position.

H. Clean all components of the AHU from construction dirt and dust.

END OF SECTION 23 70 00