15850 AIR HANDLING

PART 1 GENERAL

1.01 RELATED SECTIONS

A. 15130 – PIPING SPECIALITES
B. 15790 – COILS
C. 15810 – HUMIDIFICATION

1.02 SUMMARY COMMENTS

A. Winterizing Chilled Water Coils: Provide a means for dry air lay-up for winterization of all chilled water cooling coils on outside air. This is intended to enable freeze protecting cooling coils without the use of glycol solutions. See Standard Detail No. 3.1.6 from the Cornell Design and Construction Standards for design guidelines. Employ this detail to all air handling unit designs.

B. Draw-through air handlers shall be carefully designed so that air stratification will not cause cooling coil freeze-ups in the winter.

C. Air handling cabinets shall be sized for a maximum coil face velocity of 475 fpm when the unit is specified with a cooling coil (no exceptions).

D. Unit performance shall be certified in accordance with ARI Standard 430 for central station air handlers.

E. Maximum sound levels at discharge, return and casing shall be provided to PDC Engineering for approval during the schematic design phase.

PART 2 PRODUCTS

2.01 PREFERRED MANUFACTURERS:

Air Handling Units (Custom)  Air Enterprise
                                Buffalo Air Handling
                                HAAKON
                                MAFNA
                                M&I
                                Temtrol
                                TMI
                                Ventrol

Air Handling Units (Factory Package)  Carrier
                                        McQuay
                                        Trane
2.02 CONSTRUCTION

Air handling units over 5,000 CFM shall be Custom units with a guaranteed maximum leakage rate of 1% or less at 8 inches of water column. AMCA certified air handlers below 5000 CFM shall typically be Factory Package (modular) units unless function and/or physical constraints require the use of a custom unit. The criteria below holds true for air handling units above AND below 5000 CFM.

A. Fan Section: Draw-through units are preferred for most applications. When blow-through units are specified, ensure an appropriate means of distributing air across the entire coil face. The use of plenum fans in blow-thru applications is preferred because they promote even air distribution and velocity across the coil face. Plenum fans are also preferred in draw-thru applications where discharge duct configurations (associated with centrifugal utility set fans) will induce energy robbing system effect, and when duct discharge noise levels are a potential issue. The fan, motor, and drive shall be internally spring isolated on a structural steel base complete with flex connections and lateral restraint. Direct drive fans (with variable speed drives) are preferred over belt drive fans. The fan section shall have full size access door and adjacent removable panel for maintenance access. Fan sections typically have perforated inner walls for sound attenuation. All supply outlets and air intakes should incorporate factory bell-mouth transitions in the AHU wall.

B. Base Construction: Base frame assembly shall be fabricated from a minimum of 8 ga. galvanized and bonderized steel, and shall have a minimum of four lifting lugs per shipped section. The structural base frame shall be fitted with cross members to support all interior components. The floor shall be a double bottom construction of galvanized steel 16 ga. outer and 10 ga. inner with 4” (four inch) fiberglass (or closed cell foam) between. Combined floor and base rail height shall be sufficient to allow an appropriate condensate drain trap depth. Refer to Condensate Trap Standard Detail 3.1.7 for additional information.

C. Cabinet Construction: Double wall roof and floor construction. The outer panels shall be fabricated of 16 ga. steel. Inner panels shall be fabricated of 16 ga. galvanized steel. The panels shall be unitized in such a manner as not to disturb the insulation if panels are removed. Insulation fill shall be a minimum of 2” (two inch) thick fiberglass (or closed cell foam) which meets or exceeds a 3.0 P.C.F. (pounds per cubic foot) material density rating. The insulation shall be UL 723 fire and smoke rated. Unit construction shall incorporate thermal breaks between the inner and outer wall panels, as well as between the walls and structure. Perforated inner walls are acceptable for use in all sections except in outside air intake, cooling coil and humidifier sections.

D. Access Doors: Access doors shall be included between each air handler component. Access doors shall be a minimum 2” (two inches) thick, double walled with an interior liner not less than 18 ga. Each access door shall have a minimum of two securing latches which also are operable from inside the unit. Positively pressurized sections shall have inwardly swinging doors, while negatively pressurized doors shall swing outward. Doors shall incorporate view ports for every section.
E. **Coil Sections:** Coil sections shall be separated by a minimum space of 18" (eighteen inches). Each coil section shall have a full size access door. Coil casings shall be fabricated from 16 ga. 304 stainless steel. Removable panels shall be located on both sides of the air handler unit, not just on the coil removal side. See Cornell University Design and Construction Standards, Section 15790 – COILS for specifics on coil construction.

F. **Drain Pans:** Drain pans shall be fabricated from 304 18 ga. stainless steel and shall extend the entire length of the coil section, and extend as far as possible in the direction of airflow, far enough to catch condensate at the maximum recommended coil air velocity. Drain pans shall be insulated.

G. **Lights:** Watertight marine lights with wire guards shall be provided in each section that provides service access. A single externally wall-mounted switch shall be provided to control all interior lights. Switch shall have pilot light in handle.

H. **Filter Section:** Filter sections shall be equipped with access doors of adequate size to remove and replace the filters. A magnahelic gauge shall be mounted on the outside of the cabinet with copper probes measuring the pressure drop across the filter section. Two access doors are required for slide filter applications.

END OF SECTION