PART 1: GENERAL

1.01 Purpose:

A. This standard is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. The responsibility of the engineer is to apply the principles of this section such that the University may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be justified through LCC analysis and submitted to the University for approval.

1.02 References:

A. Codes and Standards:

1.03 Requirements:

A. Air Handling Units shall be designed to the specific requirements of the application: Recirculation or 100% Makeup. SHSU requires the use of Fan wall technology where applicable.

B. Test and rate chilled water, hot water coils in accordance with ARI 410. Display certification symbol on units of certified models.

C. Do not operate air handling systems for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation of representative.

D. Air Handler fabrication shall conform to AMCA 99 and ARI 30 in the absence of direction in this standard.

E. Provide air handling unit internal insulation having maximum flame spread rating of 25 and maximum smoke developed rating of 50.

F. Provide air handler casings design, manufactured, and installed such that no condensation shall form on the exterior or interior surfaces (other than on cooling surfaces), including joints and seams.

G. University preference is for factory built air handling units. If project conditions require, built-up air handling units may be used, but must be justified through LCC analysis and approved by the University.

H. All Air Handling Units shall be fin and tube type constructed of seamless copper with aluminum fins mechanically bonded to the tubes and copper headers. Aluminum tubes and headers will not be allowed NO EXCEPTIONS.

I. AHU shall utilize fan wall technology where possible.

J. AHU mechanical rooms shall be designed to facilitate removal and installation of tube bundle without requiring modifications to building.

K. All mechanical rooms shall be designed with a minimum 12" dropped floor.

L. AHU must have UVC lights installed between filter rack and coil section. UVC Lights must have an inspection port installed.

PART 2: PRODUCTS

2.01 Air Handler Casings (Factory):

A. General: Provide horizontal or vertical type factory fabricated air handling units as indicated, of sizes and capacities as scheduled, and as specified herein.

Perf Liner 22 26 37 44 53 55 39
Solid Liner 22 38 49 50 57 62 42

2. Minimum Casing Sound Absorption Coefficients per ASTM C-423-795.
Octave 2 3 4 5 6 7 NRC+
No liner .26 .71 1.09 1.02 .96 .83 .95
Perf Liner .25 .79 1.06 1.06 1.04 .78 1.00

3. Full sound performance data shall be submitted to the Project sound consultant for evaluation. Unit shall be finally configured so as to not exceed the room NC values as recommended in ASHRAE HVAC Applications.

2.03 Chilled Water Coils: (100% Makeup)

A. Chilled water coils shall meet all conditions and have the minimum face area and pressure drops scheduled on the Drawings, and shall have same supply and return connections unless otherwise indicated.

a. Coils shall be constructed of seamless, hard-drawn copper tubes 5/8 inches O.D. with 0.035 inches thick minimum wall thickness.

b. Continuous, flat, unenhanced plate type copper fins permanently bonded to the tubes by mechanical expansion of the tubes. Coil assemblies shall be maximum 6 rows deep. Coils shall have maximum 8 fins per inch. Fins shall be 0.010 inches thick copper.

c. Fins shall have full drawn collars to provide continuous surface cover over the entire tube surface such that no bare copper tube is visible between fins.

d. Return bends on coil tubes shall be full size, seamless copper tubing with .025 inch wall thickness. Coil tubes shall be 1-1/2 inches center to center distance with adjacent rows staggered one half the pitch distance, i.e., 3/4 inches.

e. Coils shall be counterflow, single circuit, and serpentine with full face feed headers. Coil headers shall have splayed connections.

f. Water coils shall be circuited for complete drainability.

g. Internal tube baffles or turbulators are not acceptable.

h. Internal tube grooves or riflings are not acceptable.

i. Stacked coils shall be independently demountable and supported on internal racks

j. Face velocity shall be 375-625 f.p.m at unit design airflow.

k. Coils shall be installed with vents and drains to facilitate removal and filling of water.

B. Coil headers shall be of heavy gauge seamless hard drawn copper tubing.

C. Supply and return connections shall be of Schedule 80 extra heavy, Alloy 85 red brass pipe terminated with male National Pipe Threads and shall be arranged with supply at the bottom, return at the top and separate vent and drain openings.

D. Coil connections or nozzles shall be of the same diameter, (or larger), as the coil headers.

E. Each coil assembly shall have factory installed drain and vent connections.

F. Coil casings shall be constructed with end flanges of sufficient depth to extend beyond and completely protect tube U-bends. The coil casing shall be constructed entirely of type 304 stainless steel, minimum 16 gauge. Intermediate tube support sheets shall be provided in all coils having tube lengths in excess of 60 inches and on long coil sections spacing of coil supports shall be equally spaced and not exceed 60 inches. All bolts, washers, lock washers, nuts, and other fasteners, brackets or supports shall be stainless steel.

G. Maxons.

2.08 Fans:

1. SHSU Requires the use of fan wall technology where applicable.

2. Refer to Section 5.23.34 for fan requirements.

3. All fans must be installed with mechanical anti-reversing apparatus.

2.09 Motors and Drives:

1. Refer to Section 5.23.05 for motor requirements. Motors shall be mounted to be accessible and removable through the casing access door. All motors shall be manufactured to be high efficiency and designed to be used with variable frequency drives.

2. ABB Drives preferred.

3. Motor controls must be designed with HOA operations.

2.10 Filters:

1. Refer to Section 5.23.40 for requirements.