Active Chilled Beams

PART 1 ï GENERAL

1.01 SUMMARY

Furnish and install DADANCO ACB55 (one way discharge) and ACB45 (two way discharge) active chilled beam units herein specified and as the lengths and quantities indicated on the Drawings.

1.02 REFERENCE STANDARDS

ASTM-653
UL 94-5V
UL 723
ASTM E 84 25/50
UL 2043
UL 181
AHRI 410

1.03 SUBMITTALS AND PROPOSALS

The following submittal data shall be furnished according to General Conditions and Section 15 - - - and shall include, but not be limited to:

A. Performance Data:

1. Sensible cooling capacities based on room conditions *[BTUH]*
2. Latent cooling capacities based on room conditions *[BTUH]*
3. Heating capacities *(where applicable) [BTUH]*
4. Primary, induced and total airflow rates *[CFM]*
5. Airside pressure loss *[in H_2O]*
6. Chilled and hot water flow rates *[GPM]*
7. Waterside pressure loss *[ft H_2O]*
8. Supply air leaving temperature (primary + induced) in cooling and (where applicable) heating operation *[^oF]*
9. Sound pressure levels expressed in NC including 10 dB room absorption *[NC]*
10. Sound power levels in octave bands *[125Hz – 4KHz dB]*

B. Mechanical Data

1. Unit weights and dimensions
2. Mounting bracket detail
3. Border detail for ceiling integration
4. Manufacturers recommendations for installation

1.05 WARRANTY

Comply with the requirements of the General Conditions and Section 15 - - -

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

If it complies with these Specifications, active chilled beams manufactured by one of the following manufacturers will be acceptable:

1. Dadanco

All acceptable beam manufacturers shall provide documentation showing installations of active chilled beams within North America for a minimum of five years. Manufacturers who cannot provide said documentation will not be approved.

2.02 ACTIVE CHILLED BEAM UNITS

A. Active chilled beam units shall be as indicated on the Mechanical and Architectural Drawings and shall meet the capacity and acoustical performance requirements specified and indicated on the schedule and Contract Documents. Active chilled beam cooling and heating performance data shall be based on the specified room temperature and not an assumed temperature at the ceiling or the coil, unless specified on the schedules.

B. All units shall consist of a casing manufactured from 20 GA formed sheet steel conforming to ASTM-653 standards. Air plenums shall be manufactured from 22 GA G-60 unpainted Galvanized sheet steel. Casing shall house a water coil and a primary air plenum delivering air to a series of induction nozzles. A single air connection spigot shall be mounted on the side or top of the unit as indicated on the Drawings. All sheet metal joints in the primary air plenum and air connection spigot shall be sealed airtight. The overall height of the unit shall not exceed 8ò

C. The active chilled beam visible face shall comprise two linear supply air slots positioned either side of a 50% free area perforated room air induction section. Induction grille shall be released for access to the coil without the use of tools. The supply air discharge slots shall be 20 GA formed sheet steel. The aesthetic appearance of both one and two way discharge chilled beams shall be identical. Induction air grille shall be manufactured from 20 GA perforated sheet steel conforming to ASTM-653 standards. Nozzle plate shall be painted black. The entire visible face section including the supply air slots, end plates and induction grille assembly shall be painted bone white PSP4186J.

D. Primary air shall be discharged into the mixing chamber through multi-lobed induction nozzles. The size and quantity of nozzles shall be selected to provide the primary and secondary airflows at the inlet static pressure and noise levels specified. Nozzles shall be manufactured from UL 94 V-0 flame retardant thermoplastic.

E. Active chilled beams shall be fitted with a commissioning tube for measuring the static pressure differential between the primary air plenum and the room. The commissioning tube shall be accessible from the induction air grille and be sealed airtight with a removable plug or cap. Each active chilled beam shall be provided with an airflow calibration chart showing primary airflow rate for given nozzle configuration at different static pressures.

F. Secondary water coils shall be two or four pipe configuration as indicated on the schedules. Coils shall be mounted horizontally and manufactured with ½ñ seamless copper tubing with a minimum 0.016ò wall thickness mechanically expanded into corrugated aluminum fins spaced at 10 FPI (fins per inch). Coils shall be mounted in a galvanized steel frame shielding the fin corners and sides to minimize risk of injury during cleaning. Water velocity in the tubes shall be at least 50 FPM and not exceed 240 FPM. The coils shall have a maximum working pressure of no less than 300 PSI and be factory tested for leakage at 500 PSI. Coils shall be rated in accordance with AHRI standard 410. Coil connections shall be ½ñ O.D. bare copper for field sweating to the water circuit. Water coils connection handing shall be as shown on the Drawings.

G. Active chilled beams shall be delivered to site clean and flushed. Each unit shall be labeled with identification tagging and commissioning requirements for primary air and chilled water flow. Units shall be individually packaged in cardboard cartons and palletized on wooden skids.

PART 3 ï EXECUTION

3.01 INSTALLATION

All active chilled beam units shall be installed in accordance with the latest industry standards, per the manufacturerôs recommendations and as indicated on the Drawings.

A. Active chilled beams shall be independently suspended from the structure at four points for units up to and including six feet in length. Units longer than six feet in length shall be suspended from the structure with six support points. Units shall be suspended with either Ę ò diameter suspended rods or code approved suspension wire.

B. Air connections to the main primary air duct shall be made with flexible duct with all joints sealed and made airtight.

C. The piping system shall be flushed to remove all debris before connecting to the active chilled beams. Water connections shall be flexible hoses or hard connection using sweated fittings.

D. Flexible hoses shall comprise a PTFE lined hose with stainless steel wire braided jacket rated for a maximum operating pressure of not less than 500 PSI at 200°F.

3.02 MOCK-UP INSTALLATION

Prior to installation of multiple active chilled beam units, the Contractor shall install a sample unit as a mock-up generally representative of a typical active chilled beam and ceiling installation. The mock-up installation shall be complete with piping, ductwork and water valves. The mock-up installation shall be located in one of the typical areas of the project. The Contractor shall advise the Engineer and Owners representative after the mock-up is complete and arrange a suitable time for inspection and review to determine any changes and modifications that need to be made for the installation to be acceptable to the Engineer and Owner. The Contractor shall provide the required modifications and additional follow-up field inspections as required without additional cost to the Owner.