NA

From: NA
Sent: Tuesday, March 24, 2009 6:22 PM
To: members_of_the_staff
Subject: ACMV Master Specifications
Attachments: ACMV - Section 3, 4.pdf

Our Ref: OM-SC/006

Hi all,

Please note that the following master specifications have been updated. The changes are highlighted in the attached specifications.

1. Air Conditioning & Mechanical Ventilation Installation (DSC & NSC)

   Section 3 – Chillers, Cooling Towers and Pumps - Clause 3.1
   Section 4 - Ductwork & Air Diffusion Equipment - Clause 4.8 and 4.13

Regards
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FEEDBACK REPORT FORM

Ref No: 118 - 180309(S)

To: LCT From: CLM 18/3/09

Job No./Project: MASTER SPECS FOR ACMV *(where applicable)*

Source of feedback: MASTER SPECS FOR ACMV

Scope of Feedback: * ☐ Quality ☐ Environmental ☐ Administrative ☐ Contractual ☐ Technical ☑ Specification ☐ Others

Section A : Problem & Cause

Updating of clause 3.1 on type of refrigerant to comply with Green Mark requirements and Clause 4.8 and 4.13 in accordance to Fire code 2007

Section B : Mitigating Action Taken, if any

Section C : Suggested Corrective Action

Section D : Approved Corrective Action

Document Affected * : ☑ Yes ☐ No Affected Document : A/3-1, A/4-5 & A/4-6

Approved By : Date : 20/3/2009.

Section E : Action

Action By : NA

Targeted Completion : end March 2009

Actual Completion : 24/3/09 Verified By :

* *Mark [X] where appropriate*

Distribution:

24/03/09

3.1 Refrigeration Machines

Hermetic refrigeration machines shall be supplied and installed generally as shown in the Specification Drawings. The machines shall provide cooling capacity as shown in the Schedule of Technical Requirements and be capable of working at reduced load conditions down to 10% of its specified cooling capacity under specified operating condition.

The type of refrigerant use shall be "Green" and environmental friendly (e.g. HFC134a or HCFC123, etc.) and suitable for installation in building as approved by the local Authorities.

Each refrigeration machine shall be complete with compressor, refrigerant condenser and evaporator, pumpout system, prime mover, oil pumps, purge system (if required) and control system.

The overall heat transfer coefficients shall allow for water chiller scale factor not less than 0.0001 and refrigerant condenser scale factor not less than 0.0002 for fouling of the water side of the tubes (scale factor expressed as sq m hr degree Celsius/Kcal).

The machines shall be arranged to allow any of the machines to lead in the sequence of operation as specified later.

The machines shall be arranged with isolating valves which will allow any of the refrigeration machines to be isolated without interrupting the operation of the other machines.

3.1.1 Centrifugal refrigeration machines using low pressure refrigerant:

(a) Compressor

The volute casings shall be cast from high quality close grain grey cast iron or a suitable semi-steel.

The shaft shall be an alloy steel forging and impellers shall be statically and dynamically balanced and the entire rotating assembly must operate well below its first critical speed.

Bearings shall be fully lubricated and each machine shall incorporate an oil storage tank with oil pump (electrically operated), which is to supply the lubricating system. A cooling coil and immersion heater shall be incorporated within the oil tank, both of which shall be automatically controlled to maintain the oil at the correct temperature. The oil lubrication system shall be interlocked with the compressor starting gear to ensure that the refrigeration plant cannot commence operation until the lubrication system is providing the correct quantity of oil, and at a satisfactory pressure to all bearings.

The unit shall be complete with all necessary safety devices and automatic adjustments to the loads imposed on it. Capacity control shall be by means of inlet guide vanes which shall provide continuously variable capacity from 10% to 100% of rated compressor capacity under specified operating condition. The inlet guide vanes shall be automatically controlled by a suitable chilled water control device to ensure a leaving chilled water temperature deviation of not more than +/- 0.5 degree Celsius.

(b) Heat Exchangers

4.7 Sleeves

Where ducts pass through walls or partitions, suitable galvanised sheet steel sleeves of a gauge not less than the duct concerned shall be located into place by the Sub-Contractor in liaison with building works. These sleeves shall be of lengths to suit the finished wall thickness and in the case of plastered and/or rendered walls should not protrude more than 3mm over the finished wall surface. In the case of insulated ductwork the sleeves shall be over-sized to allow the insulation and vapour sealing to be continuous through them.

Where ducts penetrate walls of plant rooms/fan rooms or penetrate floors, the insulation (if external) shall be sheathed with 16 B.G. galvanised sheet steel. The space between the duct sleeve and duct/sheath shall be tightly packed with suitable fibreglass or mineral wool insulation and sealed at both ends with approved non-hardening resilient sealant.

24/03/09

4.8 Flexible Connections

Flexible connections shall be provided on the suction and discharge connections to each fan as may be necessary throughout the Building.

Flexible connections shall not exceed 250mm in length and shall be made of material classified as "not easily ignited" when tested in accordance with methods specified under BS 476-12 "Fire Test on Building Materials and Structures".

Glass fabric material shall be coated with neoprene or other fire-retardant material on one side of the surfaces.

Flexible connections shall have heat resistance which shall withstand 148 degrees Celsius for short periods and 93 degrees Celsius continuously.

The flexible connections shall provide 80mm clearance between fan or equipment connections to ductwork. The method of connection shall permit renewal of the flexible connection without dismantling the ductwork.

Flexible connections shall not be used for connection between ductwork and stairwell pressurization or smoke stop lobby ventilation fans. In such cases, flange joints shall be used.

30/11/95

4.9 Welding

Welding of galvanised steel ductwork may be carried out where approved by the Architect in writing. The affected areas shall be wire brushed, cleaned and painted with cold galvanising paint.

30/11/95

4.10 Access Doors

The Sub-Contractor shall provide access doors with approved neoprene gaskets on all ductwork connections, both upstream and downstream of coils, heaters, humidifiers and upstream of fans, filters, fire dampers, etc for inspection, cleaning and maintenance purpose. The access doors shall measure at least 600mm (length) x 450mm (width); for smaller ducts, the width dimensions may be reduced to the width or depth of duct.

Access doors shall be hinged and fitted with sash locks, and constructed in accordance with SMACNA recommendations. For insulated ducts, the access doors shall be insulated and sheathed with 26 B.G. galvanised sheet steel. Access doors shall be constructed of 18 B.G. galvanised sheet steel suitably braced. Opening in ducts shall be stiffened by galvanised sheet steel frame rivetted to the duct; gauge thickness of the frame shall be same as the duct.

03/10/03

4.11 Duct Test Hole - Low Pressure Ductwork

Duct test holes shall be provided on the discharge duct of each fan, and each major branch duct handling over 10% of the total air to enable pitot tube or volumeter readings to be taken.

Screwed and plugged 25mm BS pipe half sockets shall be welded to a plate fixed to the side of the ducts or other convenient positions and fitted with plugs. This arrangement shall not project into the air stream and internally insulated ductwork shall have the insulation locally removed sufficient only to allow passage of robes.

Test holes shall be located at a point of minimum turbulence and the number and spacing shall be in accordance with BS 848.

30/11/95

4.12 Sealants

Where required, joints and seams shall be made air-tight by use of sealants. Liquid sealants shall not be used except on the flexible ductwork. Mastic sealant where required, shall be applied where possible, by a pressure gun to the inside of the assembled joint. Oil based caulking and glazing compounds shall not be used.

24/03/09

4.13 Fire Dampers

Fire dampers shall be supplied and fitted where shown in the Specification Drawings within the thickness of the various fire break walls, partitions and floor slabs. The fire dampers shall comply in all respects with the requirements of the local Authorities and constructed in accordance to SS CP 333 – Specifications of Fire Dampers and shall not have less than the fire rating of the wall, floor, slab or partitions in which they are located; unless otherwise indicated in the Specification Drawings, fire dampers shall be rated for not less than 4-hour fire-rating. Fire dampers shall be certified by approved Laboratory or Authority acceptable to the local Authorities. General guide for construction and installation of fire dampers shall be as provided in the "Fire Damper Guide For Air Handling Systems" published by Sheet Metal and Air Conditioning Contractors' National Association, Inc. (U.S.A.). Damper blades shall have self-aligning sintered bearings pivoting on stainless steel shaft.

Fire dampers shall be of the curtain or multi-blade type except for ducts less than 350mm (height) where curtain or single-blade type may be used.

Fusible links (70 degree Celsius) and spring catch shall be arranged at same side as the access door.

Fire dampers shall not be used for volume control. No welding to any part of fire dampers shall be allowed.

The Sub-Contractor must maintain and continually update a Schedule of Installed Fire Dampers listing the following information:

Make:
Size:
Serial No:
PSB Record of Issue of Fire Damper Labels, Job No:
Location of Installation:

This Schedule is to be submitted to the Architect at regular intervals of not less than 3 months. The final updated Schedule, together with all PSB Records of Issue of Fire Damper Labels, must be submitted to the Architect not less than 3 1/2 months before Date of Practical Completion.