NA

From: NA
Sent: Monday, January 19, 2009 5:37 PM
To: Engineer; Director; Admin
Subject: Master Specs - ACMV & FFAI

Attachments: MS ACMV Section 2 (112).pdf; MS ACMV Section 2 (113).pdf; MS ACMV Section 3 (114).pdf; MS ACMV Section 5 (115).pdf; MS FFAI Section 3 (116).pdf

OM-SC/003

Please note that the following Master Specifications have been updated as highlighted:

Air Conditioning & Mechanical Ventilation Installation

1. Section 2 - Air Handling and Cooling Equipment
2. Section 3 - Chillers, Cooling Tower & Pumps
3. Section 5 - Piping, Valves & Fittings


MS ACMV Section 2 (112).pdf (...


MS ACMV Section 2 (113).pdf (5...


MS ACMV Section 3 (114).pdf (4...


MS ACMV Section 5 (115).pdf (6...

Fire Fighting & Alarm Installation

1. Section 3 - Piping, Valves & Fittings


MS FFAI Section 3 (116).pdf (5...

Regards
NA

CLM: 2.10-3 is for AHU PF before the secondary filter

Alan 13.1.09

OK. noted. To retain 2.10.5 (filter for fan)

Alpha Consulting Engineers Pte Ltd

FEEDBACK REPORT FORM

Ref No: 112-141108 (S)

To: Andrew Loh From: CLM 14/1/08

Job No./Project: Master Specification - AIR CONDITIONING & MECHANICAL VENTILATION INSTALLATION - SECTION 2 - AIR HANDLING & COOLING EQUIPMENT (DSC & NSC) *(where applicable)*

Source of feedback: SOH KAI YEA

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

Section A : Problem & Cause

Update on the latest ASHRAE standard use for filters.

Section B : Mitigating Action Taken, if any

Section C : Suggested Corrective Action

Section D : Approved Corrective Action

Document Affected * : ☑ Yes ☐ No Affected Document : A/2-21 to A/2-22

Approved By : _____ Date : 16 Jan 09

Section E : Action

Action By : NA

Targeted Completion : end Jan 09

Actual Completion : 19 Jan 09 Verified By : _____

** Mark [X] where appropriate*

Distribution: | | | | | | | |

14/11/08

2.10 Air Filtration System

2.10.1 General

Air filtration system comprising primary and secondary filter section shall be provided to all air handling units (AHU). For fan coil units (FCU), only primary filter need to be provided. The filter media consists of high density, microfine, glass fibre shall be of non-combustible throughout or with exposed surfaces of Class O flame spread rating and shall not generate toxic gas when subject to heat or fire.

Each filter section shall be capable of handling the specified air quantity with face velocity not exceeding 2.5 m/sec. and its performance characteristics shall meet the requirements of ASHRAE 52.1 – Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter and ASHRAE 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.

Filters shall be installed in accordance with manufacturer's recommendations complete with all accessories necessary for their proper performance.

Air filter connections to adjoining equipment, panelling or support framing shall be sealed airtight to ensure that no air bypasses the filter media.

The filter assembly shall be easily accessible for inspection, maintenance and removal.

2.10.2 Housing

Filter housing shall be factory fabricated and assembled of 16-gauge galvanised steel. Framework shall be sturdy galvanised steel angle members. Each housing shall be complete with two access doors, tracks, holding frame and pressure differential sensing device.

(a) Access Doors

Access doors shall be constructed of 16-gauge galvanised steel and positioned to facilitate easy removal and replacement of filters from either side of the housing. Each door shall be equipped with adjustable and replaceable positive sealing latches and replaceable hinges. Holding frame to door contact shall be provided with air tight gasket to effect a leak proof seal.

(b) Tracks

Tracks shall be field adjustable and replaceable and of heavy gauge anodized aluminium extrusion designed to accommodate filter holding frames. Each track shall be equipped with replaceable felt stripes providing an air barrier between the track and holding frame.

(c) Holding Frames

Holding frames shall be constructed of sturdy galvanised steel member and equipped with side channels, centring dimples, multiple fastener and air tight gasket (internally and on frame sides) to facilitate a sealable side access system capable of accommodating any standard (nominal) 600 x 600 or 300 x 600 filters without modification to frame or housing. The filter media shall be held in position with PVC coated heavy gauge galvanised iron wire mesh of mesh size not larger than 75 x 75 (mm)

(d) Pressure Differential Sensing Device

A pressure differential sensor consists of static pressure probes and magnatelic pressure gauge shall be installed for each air handling unit.

The static pressure probes shall be constructed of brass and equipped with suitable fittings. The static pressure sensing assembly shall be installed such that pressure differential across the pre-filter and secondary filter can be individually measured with one pressure gauge by operating a selector or three-way valve. Accuracy shall be ± 3% from 0 to 15 mm Water Gauge. The magnahelic pressure gauge shall be permanently mounted and isolated from the AHU for visual indication of pressure difference.

2.10.3 Primary Filters

Primary filters shall be of the dry disposable type suitable for high dust holding capacity and for face velocity up to 2.5 m/sec. The filter module thickness shall not be more than 50mm.

The filter shall have an average arrestance efficiency of 90% and dust spot efficiency of 30% (equivalent to MERV 8) based on ASHRAE Standard 52.1 and 52.2.

The initial air resistance shall not exceed 0.5 mbar at face velocity of 2.5 m/sec.

2.10.4 Secondary Filters

Secondary filters shall be of the dry disposable type suitable for high dust holding capacity and for face velocity up to 2.5 m/sec. The filter module thickness shall not be more than 300 mm.

The filter shall have an average arrestance efficiency of 99% and dust spot efficiency of 90% (equivalent to MERV 13) based on ASHRAE Standard 52.1 and 52.2.

The initial air resistance shall not exceed 1.5 mbar at face velocity of 2.5 m/s.

2.10.5 Air Filters For Fan Coil Unit

The filter shall be cleanable type mounted in light weight metal frame with media held in position with PVC coated heavy gauge galvanised iron wire mesh of mesh size not larger than 75 x 75 (mm). All joints shall be fitted air tight with felt stripes. The complete unit including filter box shall be suitably treated against corrosion. The face velocity of air passing through the filter shall not exceed 1.8 m/sec and the initial air resistance shall not exceed 0.4 mbar.

09/09/04

2.11 Dehumidifiers

Dehumidifiers shall be provided and installed where required and as shown in the Specification Drawings and with capacities as specified in the Schedule of Technical Requirements.

Each dehumidifier shall be complete with an automatic humidistat to cut off the power supply at pre-set humidity level and restart upon increase in humidity in the space. Each unit shall also have a drip tray complete with hose connection and ball float, for 24 hour holding capacity. An overflow signal light incorporated in the unit shall flash when the tray is full. All dehumidifiers shall be suitable for 230 volts, single phase, 50 Hz supply.

09/09/04

2.12 Air Curtains

The air curtains shall be of grille and exposed type for wall mounting across the required entrances as indicated on the Drawings.

Alpha
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FEEDBACK REPORT FORM

Ref No: 113-090109(S)

To: LCT / CCG From: CLM 9/1/09

Job No./Project: Master Specs (ACMV)

(where applicable)

Source of feedback: _____

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

Section A : Problem & Cause

Updating of fan motor insulation.

Section B : Mitigating Action Taken, if any

Section C : Suggested Corrective Action

Section D : Approved Corrective Action

Document Affected * : ☑ Yes ☐ No Affected Document : A/2-1

Approved By : _____ Date : 15 Jan 09

Section E : Action

Action By : NA hhw

Targeted Completion : end Jan 09

Actual Completion : 19 Jan 09 Verified By : _____

** Mark [X] where appropriate*

Distribution: | | | | | | | |

090109

2.1 Fans

2.1.1 General

Fans shall be carefully selected and entirely suitable for their particular service and with respect to corrosion, inflammability or other hazardous applications.

Fans shall be capable of handling the air quantity necessary for the specified system performance against the resistance of the system. The resistance shown on the Schedule of Technical Requirements are for tendering purposes only and the Sub-Contractor shall be held responsible for checking the final system resistance before ordering the equipment.

Fans shall be balanced and free from vibration. All fan rotors, including the drive pulleys shall be statically and dynamically balanced better than 40 gram cm per 100 kg of rotor weight and shall not exceed the maximum allowable vibration criteria as specified in the Specifications. Performance test of up to 110% normal running speed shall be conducted. The rotor and pulley shall be further balanced on site to the satisfaction of the Architect. The fans shall be selected as not to exceed the maximum allowable noise levels specified in the Schedule of Technical Requirements.

Unless otherwise specified, fans shall be designed and constructed for continuous operation.

All fans shall be fitted with engraved identification and directional labels giving full details of speed, h.p., pulley and belt sizes and type of grease required, and mechanically fixed where they can be easily seen and not subject to potential damage.

After manufacture, the casing, impeller shaft and belt guards shall be thoroughly cleaned and given two coats of “Anodite” anti-corrosive paint or other approved treatment.

All fans including motors, pulleys, electrical wiring, control panels, etc within the air-stream of ventilation system for Kitchen Exhaust System shall be of the flame-proof types to comply with the requirements of the local Authorities.

2.1.2 Fans For High Temperature Operation

Fans for high temperature operation shall be capable of operating effectively up to two hours at an ambient temperature of 250 degree C. Fan motors insulation shall be Class F to BS EN 60085. Special high temperature performance grease shall be used in the bearings to prevent early bearing failure. Shrunk-in stators are to be dowelled to prevent rotation of the stator core. Fans shall be supplied with steel or cast iron impeller.

2.1.3 Centrifugal Fans

Centrifugal fans shall be supplied and fitted generally as shown in the Specification Drawings. Unless otherwise specified or shown in the Specification Drawings, the centrifugal fans shall be double inlet, double width type. Fans handling more than 35,000 CMH shall be of aero-foil backward curved blade type and fans handling 35,000 CMH or less may be of flat blade backward curved type. Fan wheels and housing shall be of galvanised steel or approved equivalent. All centrifugal fans shall be belt driven unless otherwise noted on the Schedule of Technical Requirements.