

Method of Statement – Duct Installation

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1.0 Scope :

- This method statement applies to installation of HVAC Supply / Return / Exhaust Ducts, Dampers, Fire Damper and Access Doors.

2.0 Purpose :

- The purpose of this method statement is to outline the method of storage, insulation and installation of HVAC Supply / Return / Exhaust ducts including fixing of dampers, fire dampers and access doors.

3.0 Material :

- Pre fabricated ducts made of G.I. Sheet confirming to JIS G 3302
- Duct mate flanges and corners for ducts.
- Threaded rods & MS. angles for supporting system.
- Thermal insulation as per approved submittal.
- Adhesive as per approved submittal for fixing duct insulation.
- Duct Sealant.
- VCDs, Fire dampers, Motorized dampers and Access doors

4.0 Method :

Storage:

- When off-loading, the ducts shall be carefully lowered to ensure no damage to edges or duct surface.
- All ducts shall be stored on plywood or similar material to safeguard duct from any abrasions.
- Insulation material shall be stored in proper storage place and shall not be Exposed to direct sunlight.
- Duct Sealant and adhesive for insulation shall be stored in enclosed area in closed cans as per manufacturer's recommendations.

Preparation:

- Ducts to be fabricated as per the enclosed construction schedule. The longitudinal seam of the workshop fabricated ducts assembled at site and the same is sealed with approved duct sealant.
- Suitable flanges shall be fixed to the ducts with pop rivets as fasteners. Care shall be taken to seal the corners and the transverse joints with approved duct sealant.
- Ducts prepared as above with suitable flanges shall be joined together on the floor, to form manageable lengths.
- Wherever branch take off collars are to be taken, suitable cut out shall be made in the ducts. The size of cut out shall be equal to the duct cross sectional area and secured using aluminum pop rivets and the joint between collar flange and duct surface shall be sealed with approved duct sealant.
- Wherever flexible ducts are to be fixed, a suitable diameter prefabricated collar, shall be fixed to the main duct.
- If the ducts prepared and assembled as above required insulation, the surface of duct shall be cleaned with cloth to remove dust etc. and applied with approved adhesive for proper fixation of insulation.
- Insulation sheet of suitable thickness shall be cut to the size of duct to be insulated.
- Adhesive is applied at various points on the surface and all over the periphery of the cut to size insulation sheet.
- The adhesive is allowed to dry for sometimes and the insulation sheet shall be firmly fixed to the duct. If any edge of the cut insulation sheet is visible the same shall be sealed .
- Ducts assembled on floor, as detailed above shall be insulated for the full length of the duct assembly, leaving out 50 mm on either side from the end of the length of duct assembly.

- The circular / spiral ducts received from the workshop are joined at transverse joints using aluminum rivets as per the manufacture's recommendation into manageable lengths and insulated.

Installation:

- The layout of duct to be installed shall be decided as per approved drawing.
- Position of duct supports shall be marked on the underside of the slab / structural member / vertical walls as the case may be and mechanical anchor fasteners shall be installed in slab or suitable clamps shall be installed if support to be taken from structural member, to facilitate suspension of threaded rods for duct trapeze support. The support details and spacing shall be as per the approved drawings / schedule of duct supports (Annexure – 1)
- Threaded rod of suitable size as per approved drawings shall be fixed to mechanical anchor fastener / clamps using proper lock nut.
- S. Angle / channel, cut to required size of duct (to have clearance of 50mm on either side after the insulation finish) shall be fixed to the threaded rod suspension and locked in position by suitable zinc coated nuts and washers. For circular ducts G.I strip as per approved drawings shall be used.
- Assembled, as above, ducts shall be lifted either manually or by mechanical lifting jacks required as per site conditions, or shall be installed on trapeze.
- Similarly the next length of duct shall be erected and two are joined together by means of suitable flanges with gaskets and fastened with zinc coated bolts, nuts and washers.
- On laying the ducts as detailed above to form the required layout, the ducts shall be properly aligned and leveled to maintain B.O.D. and distances as per approved drawing.
- Riser / Shaft Duct: Necessary scaffolding arrangement to suit site conditions shall be made. Duct supports shall be taken at each floor / vertical wall as the case may be and shall be as per approved drawings. Successive ducts shall be installed starting from low level as the successive higher floors are constructed. The open end of the upper most duct shall be covered properly. Insulation of the flanges shall also be completed simultaneously.
- After the alignment and leveling of ducts, the joints left without insulation shall be insulated with the insulation material as detailed above.
- Insulated flexible ducts shall be supported using 25mm G.I strip wound around the duct and suspended from slab.
- Suitable plenum box shall be connected to main duct through pre- insulated flexible ducts. These diffuser plenums shall be prefabricated and shall be duly insulated as detailed above, connection through round collars fixed to plenum. Diffuser plenum box shall be suspended from underside of slab using central hanger made of galvanized threaded rod fixed

to mechanical anchor fastener and secured using zinc coated nuts and washers. The single rod suspension shall be limited to square diffuser plenum of size up to 300mm and multiple suspension shall be provided for higher size. For slot diffuser plenum boxes suspension rod shall be provided on center of two shorter sides of the plenum.

- Manual volume control dampers as approved prefabricated and shall be fixed in the ducting system wherever mentioned in the drawing. The type of fixation shall be as per SMACNA. Insulation for VCDs shall provide as detailed for duct insulation. Care shall be taken to allow the operation of VCD handles.
- Fire damper shall be installed as per approved drawing / manufacturer installation recommendations.
- Access doors shall be provided for every fire damper. These access doors shall be prefabricated. Suitable cut out to suit the size of the access door shall be made in the duct either in the bottom or side as per site conditions. The mounting frame of access door is fixed to the duct. The door is secured in position within the mounting frame using cam locks provided in the access door. The Access Door shall be Pre-insulated (Double Skin)
- Diffusers plenum shall be leveled properly to suit false ceiling. Suitable framework in false ceiling to align and level these diffuser boxes shall be provided by the false ceiling contractor.
- The insulated ducts are identified as per approved identification system.

5.0 Inspection :

5.1. Initially a sample installation of ducts involving following components shall be installed.

5.1.2. Three pieces of ducts, each of size 800 mm x 600 mm and 1200 mm long joined together.

5.1.3. Take off collar with a one piece of branch duct with a 150mm spigot.

5.1.4. One VCD and Fire damper with access door.

5.1.5. One diffuser plenum with flexible duct connected to the branch duct.

5.1.6. Consultant Engineer shall witness the entire process of preparation of duct assembly detailed above and shall form a basis for entire ductwork.

5.2 After the duct installation QC shall inspect the complete installation and offer the same for consultant's inspection.

5.3 On fixation of final fix items like grilles / diffusers etc, consultant's engineer shall be invited for final inspection and certification.

6.0 Safety :

6.1. Safety precautions shall be followed with inline established project safety plan.

7.0 References :

7.1 Project Specifications

7.2 SMACNA.

7.3 Approved shop drawings.

7.4 Quality Control Procedure

8.0 Attachments :

8.1 Annexure- I : Low (500 Pa / 2") pressure duct work construction schedule.