

VOLUME- IIPREAMBLE TO THE SCHEDULE OF QUANTITIES

1. All equipment described hereafter shall be in accordance with the specifications.
2. All equipment shall be selected and installed for the lowest operating noise level.
3. Supply of various equipment shall include all expenses for correspondence with manufacturers, submission of shop drawings, documents and their approval by the Consulting Engineer, procurement of equipment, transportation, shipping, payment of all taxes and levies, storage, supply of equipment at the point of installation, furnishing all technical literature required, replacement of defective components and warranty obligations for the individual equipment.
4. Installation of various equipment shall include all material and labour associated with hoisting and lowering of equipment in position, insulation of the components and vibration isolation as required, grouting & anchoring or suspension arrangements and all incidentals associated with the installation as per the specifications and manufacturer's recommendation.
5. Vibration isolators as specified or as recommended by the manufacturer shall be installed with each component. Performance ratings, power consumption and sound power data for each component shall be verified at the time of testing and commissioning of the installation, against the data submitted with the tenders.
6. Shop coats of paint that have become marred during shipment or erection shall be cleaned off with mineral spirit, wire brushed and spot primed over the affected areas, then coated with enamel paint to match the finish over the adjoining shop painted surfaces.
7. Testing and commissioning shall include furnishing all labour, materials, equipment, instruments and incidentals necessary for complete testing of each component as per the specifications & manufacturer's recommendations, submission of test results to the Consulting Engineer, obtaining their approval and submission of necessary completion documents & drawings.
8. All piping shall be installed conforming to the relevant Indian Standards, approved shop drawings and the specifications. All water re-circulation piping shall be tested as per the specifications.

9. Piping installation shall include all costs towards supplying and fixing of pipes & fittings (elbows, tees, reducers) cutting, threading, joining, welding, soldering & affecting connections as required, providing non-hardening sealing material as well as rubber gaskets for screwed flanges, providing and installing adequate number of clamps, hangers, saddles, brackets, rawl plugs and other accessories for pipe supports, providing minor dressing of walls and floor, providing and installing pipe sleeves as required and treatment to pipes as per the specifications.
10. Exposed steel pipes shall be given two coats of approved paint as per the relevant Indian Standards for colour coding of pipes and direction of flow of fluid in the pipes shall be visibly marked with identifying arrows.
11. Valves, unions, strainers, drain, air valves, expansion joints, pressure gauges and thermometers shall be provided in the various pipe lines as per the approved shop drawings and specifications.
12. After completion of the installation, the entire piping system shall be tested for leak in accordance with the specifications.
13. All ducts shall be fabricated and installed conforming to the relevant Indian Standards, approved shop drawings and the specifications.
14. Duct installation shall include fabricating and installing the ducts, splitter dampers, turning vanes, distribution grids within the ducts in position extruded aluminium hardware fittings such as handles, hinges, factory fabricated access door and providing, installing, MS hangers with dash fasteners, foam rubber insertions, nuts, bolts and screws as required. Making all joints air tight using rubber insertions in addition multi-louvered manually adjustable dampers shall be provided in various branch ducts as required or shown on drawings for proper balancing of air flow. All primer coated MS hangers, dampers, base frames etc. shall be painted with black enamel paint.
15. All registers and diffusers shall be provided with a soft continuous rubber gaskets between their periphery and the surface on which these have to be mounted.
16. MS registers and diffusers shall be given, at the factory, a rust resistant primer coat and enamel paint finish of approved colour. Aluminium grilles and diffusers shall be fabricated out of extruded aluminium sections.
17. After completion of the installation, the entire air distribution system shall be tested for leaks and balanced in accordance with the specifications.

18. Mode of Measurement

The mode of measurement for the various items, unless otherwise specified, shall be as follows :

18.1 Ducting

Payment for ducting shall be made on the basis of the external surface area of the ducting including all material and labour for installed duct.

The rates per Square metre of the external surface shall include MS angle iron /GSS flanges, gaskets for joints, nuts & bolts , duct supports & hangers, vibration isolation pads or suspenders, dash fastners, inspection doors, dampers, turning vanes, major hardware such as thunder bolts, hinges, handles in extruded aluminium construction and any other item which will be required to complete the duct installation except external insulation and acoustic lining.

The external area shall be calculated by measuring the overall width and depth (including the corner joints) in the centre of the duct sections and overall length of each duct section from flange face incase of duct lengths with uniform cross section. Total area will be arrived at by adding up the areas of all duct sections.

In case of taper pieces average width and depth will be worked out as follows :

W1 = width of small cross section

W2 = width of large cross section

D1 = depth of small cross section

D2 = depth of large cross section

Average width = $\frac{W1 + W2}{2}$

Average depth = $\frac{D1 + D2}{2}$

Width and depth in the case of taper pieces shall be measured at the edge of the collar of the flange for duct sections fitted with angle iron flanges, otherwise at the bottom of the flange where flanges are of duct sheet.

For the circular pieces the diameter of the section mid-way between large and small diameters shall be measured and adopted as the mean diameter for calculating the surface at the taper piece.

For the face length of taper piece shall be the mean of the lengths measured face to face from the centre of the width and depth of flanges.

Duct measurements for calculation of area shall be taken before application of insulation.

For the special pieces like bends, branches, and tees etc. same principle of area measurement as for linear lengths shall be adopted except for bends and elbows, the length of which shall be the average of the lengths of inner and outer periphery along with curvature or angle of the piece.

18.2 Un-insulated Piping

Payment for un-insulated piping shall be made on the basis of linear measurement including all materials and labour for installed pipe. The linear rate per meter/feet for each nominal diameter shall include all pipe fittings, flanges, unions, gaskets for joints, bolts and nuts, pipe supports and hangers, vibration isolation devices or suspenders, flexible connections and any other item required to complete the pipe installation except valves of any kind and strainers. the length of the pipe section with flanges shall be from flange face to flange face.

For fitting like bends, elbows, branches and tees etc. same principle of linear measurement as for pipe sections shall be adopted except for bends, the length of which shall be the average of the lengths of inner and outer periphery along the curvature.

18.3 CHW Pipe Insulation

This item is provided separately for various sizes and shall be paid for on linear measurement basis of uninsulated pipes including all materials and labour for application of insulation. The linear rate per meter/feet for each nominal diameter shall include insulation for all pipe fittings, flanges, valves, strainers etc. Insulation for valves shall also be paid on linear length basis for nominal size of pipe. Insulation for valves shall not be paid separately.

For insulation of fitting like bends, elbows, branches and tees etc. same principle of linear measurement as for pipe sections shall be adopted except for bends, the length of which shall be the average of the lengths of inner and outer periphery along the curvature. The length of the pipes to be insulated shall be measured before application of insulation.

18.4 Duct Insulation

This item is provided separately for various thickness and shall be paid for on area basis of un-Insulated duct. The area of the duct to be insulated shall be measured before application of insulation.

18.5 Grilles & Diffusers

All extruded aluminium grilles and diffusers shall be paid on the basis of actual measurement at site. Area of extruded aluminium diffusers shall be derived from neck size.

18.6 Exhaust Hoods

All kitchen exhaust hoods shall be measured and accounted for the area derived from plan dimensions.

18.7 Valves / Strainer

Payment will be made on unit basis.

19. All quantities indicated in this schedule are for Contractor's guidance only.

20. Appropriate troughs in the suspended ceiling be provided for terminating duct collars for diffusers & grilles by other agencies to achieve desired interior finishes.