HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1. GENERAL

1.1 Scope

.1 Pipe hangers and supports

.2 Duct hangers and supports

.3 Flashing for mechanical equipment

.4 Sleeving for mechanical equipment

.5 Pipe anchors

1.2 Reference Standards

.1 Pipe supports shall meet the requirements of current edition of ANSI/ASME B31.1, Power Piping.

.2 Automatic sprinkler pipe supports shall meet the requirements of current edition of NFPA No. 13, Standard for the Installation of Sprinkler Systems.

.3 Standpipe and hose system pipe supports shall meet the requirements of current edition of NFPA No. 14, Standard for the Installation of Standpipe and Hose Systems.

.4 Duct hangers shall follow the recommendations of the current edition of the SMACNA Duct Manuals.

1.3 General Requirements

.1 Provide hangers and supports to secure equipment in place, prevent vibration, maintain grade; provide for expansion and contraction and to accommodate insulation; provide insulation protection saddles.

.2 Install supports of strength and rigidity to suit loading without unduly stressing building. Locate adjacent to equipment to prevent undue stresses in piping and equipment.

.3 Select hangers and supports for the service and in accordance with the Manufacturer's recommended maximum loading. Hangers shall have a 5.0 safety factor.

.4 Fasten hangers and supports to building steel or inserts in concrete construction.

.5 Provide and set sleeves required for equipment, including openings required for placing equipment. Provide sleeves for all pipe and duct penetrations through walls, ceilings, floors and footings.

.6 Dielectrically isolate dissimilar metals.

.7 Obtain approval from the Contract Administrator prior to drilling for inserts and supports for piping systems.

.8 Obtain approval from the Contract Administrator prior to using percussion type fastenings.

.9 Use of piping or equipment for hanger supports is not permitted.

.10 Use of perforated band iron, wire or chain as hangers is not permitted.

.11 Do not weld piping, ductwork or equipment supports to building metal decking or building structural steel supports unless prior written approval has been obtained from the Contract Administrator.

.12 Where deemed necessary by the Contract Administrator the Contractor shall, at his own cost, employ a structural engineer to design equipment supports and/or pipe anchors.

2. PRODUCTS

2.1 Inserts

.1 Inserts shall be malleable iron case or galvanised steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms.

.2 Size inserts to suit threaded hanger rods.

2.2 Pipe Hangers and Supports

.1 Hangers, Pipe sizes 15 mm to 40 mm: adjustable wrought steel ring.

.2 Hangers, Pipe sizes 50 mm to 100 mm and Cold Pipe Sizes 150 mm and Over: adjustable wrought steel clevis.

.3 Hangers, Hot Pipe Sizes 150 mm and over: adjustable steel yoke and cast iron roll.

.4 Multiple or Trapeze Hangers: steel channels with welded spacers and hanger rods, cast iron roll and stand for hot pipe sizes 150 mm and over.

.5 Wall Support, Pipe Sizes to 75 mm: cast iron hook.

.6 Wall Support, Pipe Sizes 100 mm and over: welded steel bracket and wrought steel clamp, adjustable steel yoke and cast iron roll for hot pipe sizes 150 mm and over.

.7 Vertical Support: steel riser clamp.

.8 Floor Support, Pipe Sizes to 100 mm and All Cold Pipe Sizes: cast iron adjustable pipe saddle, locknut nipple, floor flange and concrete pier to steel support.

.9 Floor Support, Hot Pipe Sizes 125 mm and over: adjustable cast iron roll and stand, steel screws and concrete pier or steel support.

.10 Install hangers so they cannot become disengaged by movements of supported pipe.

.11 Provide copper plated hangers and supports for copper piping or provide sheet lead packing between hanger or support and piping. Provide galvanised hangers and supports for galvanised piping.

2.3 Hanger Rods

.1 Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.

2.4 Duct Hangers and Supports

.1 Conform to current edition of SMACNA handbooks.

2.5 Flashing

.1 Steel Flashing: 0.55 mm (26 ga) galvanised steel.

.2 Lead Flashing: 25 kg/m² (5 lb/ft²) sheet lead for waterproofing, 5 kg/m² (1 lb/ft²) sheet lead for soundproofing.

.3 Safes: 25 kg/m² (5 lb/ft²) sheet lead or 0.5 mm (0.02 inch) neoprene.

.4 Caps: Steel, 0.7 mm (24 ga) thickness minimum, 1.6 mm (16 ga) thickness at fire resistance structures.

2.6 Sleeves

.1 Pipes through Floors: Form with 1.2 mm (18 ga) galvanised steel.

.2 Pipes through Beams, Walls, Fire Proofing, Footings, Potentially Wet Floor: Form with steel pipe or 1.2 mm (18 ga) thickness galvanised steel.

.3 Ducts: Form sleeves with galvanised steel.

.4 Size large enough to allow for expansion with continuous insulation.

2.7 Pipe Seals

.1 Provide “Link-seal” pipe sealing system where passing through room foundation walls.

2.8 Finishes on Hanger Rods, Hangers and Supports

.1 All steel hanger rods, hangers and supports shall be galvanised or factory primed with alkyd red oxide primer to CAN/CGSB-1.40.

3. EXECUTION

3.1 Inserts

.1 Use inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams wherever practicable.

.2 Set inserts in position in advance of concrete Work. Provide reinforcement rod in concrete for inserts carrying piping over 100 mm or ducts over 1500 mm wide.

.3 Where concrete slabs form finished ceiling, finish inserts flush with slab surface.

.4 Where inserts are omitted, drill through concrete slab from below and provide rod with recessed square steel plate and nut above slab.

3.2 Pipe Hangers and Supports

.1 Support horizontal steel and copper piping as follows:

Nominal Pipe Size	Distance Between Supports		Hanger Rod Diameter
	Steel	Copper	
15 mm	1.8 m (6 ft)	1.5 m (5 ft)	10 mm (0.4 in)
20 mm to 40 mm	2.1 m (7 ft)	1.8 m (6 ft)	10 mm (0.4 in)
50 mm & 65 mm	3.0 m (10 ft)	2.4 m (8 ft)	10 mm (0.4 in)
80 mm & 100 mm	3.6 m (12 ft)	3.0 m (10 ft)	16 mm (0.6 in)
150 mm to 300 mm	4.2 m (14 ft)	4.0 m (13 ft)	22 mm (¾ in)
350 mm to 450 mm	6.0 m (20 ft)	--	25 mm (1 in)

.2 Install hangers to provide minimum 12 mm (½ inch) clear space between finished covering and adjacent Work.

.3 Place a hanger within 300 mm of each horizontal elbow.

.4 Use hangers which are vertically adjustable 40 mm minimum after piping is erected.

.5 Support horizontal soil pipe near each hub with 1500 mm maximum spacing between hangers.

.6 Support vertical piping at every other floor. Support vertical soil pipe at each floor at hub.

.7 Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

.8 Where practical, support riser piping independently of connected horizontal piping.

.9 Use oversized hangers to accommodate pipe insulation thickness. For pipes up to 50 mm, use high density rigid pipe insulation at hanger location, with an insulation protection shield. For pipes 65 mm and over, use insulation protection saddle.

3.3 Low Velocity Duct Hangers and Supports

.1 Hanger Minimum Sizes:

.1 Up to 750 mm wide: 25 mm x 1.6 mm (16 ga) at 3000 mm spacing.

.2 790 to 1200 mm wide: 40 mm x 1.6 mm (16 ga) at 3000 mm spacing.

.3 Over 1200 mm wide: 40 mm x 1.6 mm (16 ga) at 2400 mm spacing.

.2 Horizontal Duct on Wall Supports Minimum Sizes:

.1 Up to 450 mm wide: 40 mm x 1.6 mm (16 ga) or 25 x 25 x 3 mm (11 ga) at 2400 mm spacing.

.2 475 mm to 1000 mm wide: 40 mm x 40 mm x 3 mm (11 ga) at 1200 mm spacing.

.3 Vertical Duct on Wall Supports Minimum Sizes at 3600 mm spacing:

.1 Up to 600 mm wide: 40 mm x 1.6 mm (16 ga).

.2 625 mm to 900 mm wide: 25 mm x 25 mm x 3 mm (11 ga).

.3 925 mm to 1200 mm wide: 30 mm x 30 mm x 3 mm (11 ga).

.4 Over 1200 mm wide: 50 mm x 50 mm x 3 mm (11 ga).

.4 Vertical Duct Floor Supports Minimum Sizes, Riveted or Screwed to Ducts:

.1 Up to 1500 mm wide: 40 mm x 40 mm x 3 mm (11 ga).

.2 Over 1500 mm wide: 50 mm x 50 mm x 3 mm (11 ga).

3.4 Equipment Bases and Supports

.1 Rigidly anchor ducts and pipes immediately after vibration connections to equipment.

3.5 Flashing

.1 Flash and counterflash where mechanical equipment passes through weather or waterproofed walls, floors, and roofs.

.2 Flash vent and soil pipes projecting 75 mm minimum above roof membrane with lead worked 25 mm minimum into hub, 200 mm minimum clear on sides with minimum 600 mm x 600 mm sheet size. For pipes through outside walls turn flange back into wall and caulk.

.3 Provide curbs for mechanical roof installations minimum 200 mm high. Flash and counterflash with steel; solder and make waterproof.

.4 Provide lead flashing around ducts and pipes passing from equipment rooms, installed according to Manufacturer's data for sound control.

3.6 Sleeves

.1 Extend sleeves through potentially wet floors 25 mm above finished floor level. Caulk sleeves full depth and provide floor plate.

.2 Piping and ductwork passing through floor, ceiling or wall, close off space between duct and sleeve and non-combustible insulation. Provide tight fitting metal caps on both sides and caulk.

.3 Piping passing through mechanical room floor, roof or wall, close off space between pipe and sleeve with synthetic rubber compound mechanical type seals.

.4 Sleeves provided through walls or floors where liquids could potentially pass from one side to the other, provide sleeves with a 25 mm "flange" welded to the external face of the sleeve at the mid point of the thickness of the structure to provide a water stop.

.5 Install chrome-plated escutcheons where piping passes through finished surfaces.

END OF SECTION