



- .4 Vertical riser support system.

## **Part 2 Products**

### **2.1 PIPE SUPPORTS**

- .1 Refer to drawing details.
- .2 Material and Finish: steel, prime coated or hot dip galvanized.

### **2.2 HANGER RODS**

- .1 Material: hot rolled carbon steel, minimum diameter of 10 mm.
- .2 Safety Factor: minimum 5:1 and to Table 121.2.2 of ANSI B31.1.
- .3 Threading: as required to accommodate final pipe gradients and installation.
- .4 Finish: factory prime coat or hot dip galvanized.

### **2.3 DUCT HANGERS AND SUPPORTS**

- .1 Hangers: Galvanized steel band iron or rolled angle and 10 mm rods.
- .2 Wall Supports: Galvanized steel bank iron or fabricated angle bracket.
- .3 Vertical Support at Floor: Rolled angle.

### **2.4 FLASHING**

- .1 Steel Flashing: 0.55 m galvanized steel.
- .2 Lead Flashing: sheet lead, as follows:
  - .1 For Soundproofing: 5 kg/m<sup>2</sup>.
  - .2 Lead Sheet Size:
    - .1 Roof Drains: minimum 810 mm x 810 mm.
    - .2 Roof Plumbing Vents: as required to provide base flashing overlap to ARCA detail.
    - .3 Floor Drains: minimum 920 x 920 mm and as specified.
    - .4 Other Locations: as specified.
- .3 Safes: 200 micrometre neoprene.
- .4 Caps: Steel, 0.70 mm thickness minimum, 1.6 mm thickness at fire resistance structures.

## **2.5 SLEEVES**

- .1 Pipes through Floors: Form with 1.2 mm galvanized steel.
- .2 Pipes through Beams, Walls, Fire Proofing, Footings, Potentially Wet Floor: Form with steel pipe or 1.2 mm thickness galvanized steel.
- .3 Roof Drains: form sleeves with 0.7 mm thick sheet steel galvanized with Z275 zinc coating to ASTM A653M-96. Refer to Detail Drawings appended to Section specifying roofing membrane.
- .4 Round Ducts: Form sleeves with galvanized steel.
- .5 Rectangular Ducts: Form sleeves with galvanized steel or wood.
- .6 Size large enough to allow for expansion with continuous insulation.

## **2.6 FINISHES ON HANGER RODS, HANGERS AND SUPPORTS**

- .1 All steel hanger rods, hangers and supports shall be galvanized or factory primed with alkyd red oxide primer to CAN/CGSB-1.40-M89.

## **Part 3 Execution**

### **3.1 INSTALLATION - GENERAL**

- .1 Install supports to secure equipment in place, prevent vibration, maintain grade and allow for expansion and contraction.
- .2 Install rubber vibration isolators on piping supports in drywall partitions. Refer to Section 23 05 48 and 22 42 00.
- .3 Fasten supports to building structural steel system or to cast-in-place inserts in concrete construction.
- .4 Provide insulation protection saddles (Type 39) with protection shields (Type 40) on insulated piping systems as defined in schedule.
- .5 Locate support adjacent to equipment. Prevent excessive stresses on piping and equipment connections.
- .6 Do not support piping from other piping or from equipment.
- .7 For horizontally hung multiple pipe runs, use trapeze support assembly with pipe supports as scheduled. Space trapezes at intervals determined by minimum pipe sizes in run. See Horizontal Support Spacing, Article 3.4.
- .8 On multiple pipe runs, allow minimum 12 mm clearance between finished pipes including insulation.

- .9 Install hanger within 300 mm of horizontal and vertical elbows.
- .10 Support vertical piping at every second floor level.
- .11 Support riser piping independently of connected horizontal piping.
- .12 Support vertical soil pipes at each floor at joint.
- .13 Pack 1 mm thick sheet lead between hanger or support and dissimilar metal piping.
- .14 Support piping as defined in Schedule.

**3.2 HOUSEKEEPING PADS, SUPPORTS AND ANCHORS**

- .1 For major equipment, provide reinforced concrete housekeeping pads poured directly on floor slab, 100 mm thick minimum, extended 100 mm minimum beyond machinery bedplates. Provide templates, anchor bolts and accessories required for mounting and anchoring equipment.
- .2 Construct supports of structural steel members or steel pipe and fittings. Brace and fasten with flanges bolted to structure.
- .3 Provide rigid anchors for pipes immediately after flexible pipe connections to equipment, except where detailed otherwise.

**3.3 HORIZONTAL PIPE SUPPORT SPACING**

- .1 Support steel and copper single line piping as follows:

<i>Nominal Pipe Size (mm)</i>	<i>Maximum Distance Between Supports (m)</i>		
	<i>Steel (Water)</i>	<i>Steel (Steam)</i>	<i>Copper (Water)</i>
12 mm to 20	2.1	2.4	1.5
25	2.1	2.7	1.8
30	2.1	2.7	2.1
40	2.7	3.7	2.4
50	3.0	4.0	2.4
65	3.4	4.3	2.7
80	3.7	4.6	3.0
100	4.3	5.2	3.7
150	5.2	6.4	4.3
200	5.8	7.3	-
250	6.1	7.9	-
300	7.0	9.1	-

- .2 Provide additional supports for concentrated loads such as valves, specialties and pipe fittings or changes in direction.

- .3 Support horizontal exposed cast iron soil pipe and storm sewer pipe 3 m maximum space and as follows:
  - .1 at each pipe section
  - .2 at each change in direction
  - .3 at each branch connection
- .4 Support plastic horizontal exposed soil pipe and storm sewer pipe:
  - .1 at intervals not exceeding 1.2 m
  - .2 at the ends of branches
  - .3 at changes of direction or at traps more than 1 m from the fixture drain

Note: Soil pipe and storm sewer pipe in crawlspaces and below structural slab on grade is considered “exposed”.

### 3.4 PIPE SUPPORT SCHEDULES

- .1 Horizontal Single Pipe
  - .1 Hot and cold piping systems up to 120°C, insulated.

<i>Size</i>	<i>Hanger Types</i>
40 mm and smaller	1, 5, 7, 9, 10,
50 mm & 75 mm	1, 3
100 mm and larger	41, 43, 49
  - .2 Ambient piping systems, bare pipe.

<i>Size</i>	<i>Hanger Types</i>
40 mm and smaller	1, 3, 4, 5, 7, 9, 10, 24, 26
50 mm and larger	1, 3, 4, 5, 7, 9, 10
- .2 Horizontal Multiple Pipe Runs on Trapeze
  - .1 Hot and cold piping systems up to 120°C, insulated.

<i>Size</i>	<i>Hanger Types</i>
Up to 50 mm	24, 26, 36, 37, 38
50 mm and larger	35, 44, 45, 46
  - .2 Ambient piping systems, uninsulated.

<i>Size</i>	<i>Hanger Types</i>
Up to 100 mm	24, 26, 36, 37, 38
150 mm and larger	35, 36, 37, 38

.3 Vertical Piping Runs

<i>Size</i>	<i>Hanger Types</i>
20 mm and smaller	12, 37
25 mm to 75 mm	8, 24
100 mm and larger	42, 24

.4 Fasteners to Building Structure as follows:

Concrete:	Type 18
Structural Steel:	Type 19, 20, 21, 23, 25, 28, 29, 30
Vertical Structure:	Type 31, 34

**3.5 LOW VELOCITY DUCT HANGERS AND SUPPORTS**

.1 Hanger Minimum Sizes:

- .1 Up to 750 mm wide: 25 x 1.6 mm at 3 m spacing.
- .2 790 to 1200 mm wide: 40 x 1.6 mm at 3 m spacing.
- .3 Over 1200 mm wide: 40 x 1.6 mm at 2.4 m spacing.

.2 Horizontal Duct on Wall Supports Minimum Sizes:

- .1 Up to 450 mm wide: 40 x 1.6 mm or 25 x 25 x 3 mm at 2.4 m spacing.
- .2 480 x 1000 mm wide: 40 x 40 x 3 mm at 1.2 m spacing.

.3 Vertical Duct on Wall Supports Minimum Sizes at 3.65 m spacing:

- .1 Up to 610 mm wide: 40 x 1.6 mm.
- .2 640 to 900 mm wide: 25 x 25 x 3.
- .3 Over 1520 mm wide: 50 x 3 mm.
- .4 940 to 1200 mm wide: 30 x 30 x 3 mm.

.4 Vertical Duct Floor Supports Minimum Sizes, riveted or screwed to ducts:

- .1 Up to 1520 mm wide: 40 x 40 x 3 mm.
- .2 Over 1520 mm wide: 50 x 3 mm.

### **3.6 EQUIPMENT BASES AND SUPPORTS**

- .1 Provide for major equipment, reinforced concrete housekeeping bases poured directly on structural floor slab 100 mm thick minimum, extended 100 mm minimum beyond machinery bed plates. Provide templates, anchor bolts and accessories required for mounting and anchoring equipment.
- .2 Construct supports of structural steel members or steel pipe and fittings. Brace and fasten with flanges bolted to structure.
- .3 Rigidly anchor ducts and pipes immediately after vibration connections to equipment.

### **3.7 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. For pipes through outside walls turn flange back into wall and caulk.
- .3 Flash floor drains over finished areas with lead minimum 250 mm clear on sides. Fasten flashing to drain clamp device.
- .4 Provide curbs for mechanical roof installations, minimum 200 mm high.
- .5 Attach counterflashings to mechanical equipment and lap base flashings on roof curbs.
- .6 All joints in counterflashings shall be flattened and soldered double seam. Storm collars shall be adjustable to draw tight to pipe with bolts. Caulk around the top edge. Use storm collars above all roof jacks.
- .7 Screw vertical flange section of roof jacks to face of curb.
- .8 Provide lead flashing around ducts and pipes passing from equipment rooms, installed according to manufacturer's data for sound control.
- .9 Cut openings in lead flashings installed over roof drains and work down lead into drain body as indicated on detail drawings appended to roofing specification.

**3.8 SLEEVES**

- .1 Set sleeves in position in advance of concrete work. Provide suitable reinforcing around sleeves.
- .2 Where piping or ductwork passes through floor, ceiling or wall, close off space between pipe or duct and construction with non-combustible insulation. Provide tight fitting metal caps on both sides and caulk.
- .3 Install chrome plated escutcheons where piping passes through finished surfaces.

**END OF SECTION**