| Pipe Size[1] (mm) | Max. Wt. (kg per meter) | Brace Spacing (m) | | Vertical Hangers[4] Angles (mm) | Transverse Braces Angles (Cable Size)[2] (mm) | Longitudinal Braces Angles[5] (Cable Size)[3] (mm) | Bolt Size[6] (mm) | Connec-tion Type to Structural Member[7] | Rod Size (mm) | Max. Length for Rods (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | note[2] | note[3] | | | | | | | |
| 63.5 | 11.2 | 12.2 | 24.4 | 50.8×50.8×1.61 | 76.2×76.2 ×1.61 (A) | 76.2×76.2×1.61 (C) | 9.5 | C | 12.7 | 635 |
| 76.2 | 16.1 | 12.2 | 24.4 | 50.8×50.8×1.61 | 76.2×76.2×1.61 (B) | 76.2×76.2×1.61 (D) | 9.5 | C | 12.7 | 635 |
| 101.6 | 24.3 | 12.2 | 24.4 | 76.2×76.2×1.61 | 101.6×101.6 ×2.0 (C) | 101.6×101.6×2.0 (E) | 9.5 | D | 15.9 | 787 |
| 127.0 | 34.7 | 12.2 | 24.4 | 101.6×101.6×2.0 | 101.6×101.6 ×2.0 (D) | 101.6×101.6×2.0 (F) | 12.7 | D | 19.0 | 952 |
| 152.4 | 47.0 | 12.2 | 12.2 | 63.5×63.5×1.61 | 101.6×101.6×2.0 (E) | 101.6×101.6×2.0 (E) | 15.9 | C | 15.9 | 787 |
| 203.2 | 75.0 | 12.2 | 12.2 | 101.6×101.6×2.0 | 76.2×76.2×2.75 (G) | 76.2×76.2×2.75 (G) | 15.9 | D | 19.0 | 952 |
| 254.0 | 111.4 | 6.1 | 6.1 | 101.6×101.6×2.0 | 76.2×76.22.75 (F) | 76.2×76.2×2.75 (F) | 15.9 | D | 15.9 | 787 |
| 304.8 | 147.0 | 6.1 | 6.1 | 101.6×101.6×2.0 | 76.2×76.2×2.75 (G) | 76.2×76.2×2.75 (G) | 15.9 | D | 19.0 | 952 |
| 355.6 | 182.0 | 6.1 | 6.1 | 101.6×101.6×2.0 | 76.2×76.2×2.75 (H) | 76.2×76.2×2.75 (H) | 15.9 | D | 19.0 | 952 |
| 406.4 | 237.1 | 6.1 | 6.1 | 101.6×101.6×2.0 | 101.6×101.6×2.75 (I) | 101.6×101.6×2.75 (I) | 19.0 | E | 22.2 | 1111 |

**Table 6-7M Schedule for Bracing Pipes and Conduit, SHL B**

*NOTES:*

1. Applies to pipe and conduit.
2. Transverse brace spacing. *See* Table 3-2 for cable size.
3. Longitudinal brace spacing. *See* Table 3-2 for cable size.
4. The vertical hanger in the schedule is required in addition to the hanger rod only when the maximum length for rods is exceeded.
5. *See* Chapter 3 for general requirements.
6. Place standard flat washers between sheet metal angles and nut.
7. *See* Table 9-1 for "Connection Type" to structural supporting members.
8. Framing Channel may be used as an alternative to the structural members in the table.

| Pipe Size[1] (in.) | Max. Dead Load on Trapeze (lb) | Vertical, Transverse, & Longitudinal Angles (Cable Size)[2] (in.) | Maximum Trapeze Span (in.) | Horizontal Strut (in.) | Bolt to Angle[3] (in.) | Connection Type To Structural Member[4] | Rod Size (in.) | Max. Length for Rods (in.) |
|---|---|---|---|---|---|---|---|---|
| 2.5 | 395 | L4×4×14ga (F) | 30 | 1⅝×3¼×12ga | ½ | D | ⅞ | 43.75 |
| 3 | 540 | L4×4×14ga (G) | 30 | 1⅝×3¼×12ga | ⅝ | D | 1 | 50 |
| 4 | 815 | L4×4×14ga (F) | 38 | 1⅝×3¼×12ga | ⅝ | D | ⅞ | 43.75 |
| 5 | 932 | L4×4×14ga (F) | 36 | 1⅝×3¼×12ga | ⅝ | D | ⅞ | 43.75 |
| 6 | 945 | L4×4×14ga (G) | 32 | 1⅝×3¼×12ga | ⅝ | D | ⅞ | 43.75 |
| 8 | 1006 | L4×4×14ga (G) | 27 | 1⅝×3¼×12ga | ⅝ | D | 1 | 50 |

**Table 6-8 Schedule for Bracing Pipes on Trapeze, SHL B**

*NOTES:*

1. This schedule is based on four equal-sized pipe arrangements for pipe 5 in. and smaller. The schedule also limits the number for 6 in. pipes to three and 8 in. pipes to two. However, any combination of pipes can be used if the total combined weight of the pipes on a trapeze is equal to or less than the maximum dead load noted and the maximum trapeze span and size of diagonal braces noted in the schedule are maintained.

2. Provide transverse and longitudinal braces at 40 ft maximum for pipes smaller that 4 in. and at 20 ft maximum for pipes 4 to 8 in. Install one transverse brace and one longitudinal brace at each end of the trapeze. *See* Table 3-2 for cable size.

3. Place standard flat washer between sheet metal angles and nut.

4. *See* Table 9-1 for "Connection Type" to structural supporting member.

5. Framing Channel may be used as an alternative to the structural members in the table.

| Pipe Size[1] (mm) | Max. Dead Load on Trapeze (kg) | Vertical, Transverse, & Longitudinal Angles (Cable Size)[2] (mm) | Maximum Trapeze Span (mm) | Horizontal Strut (mm) | Bolt to Angle[3] (mm) | Connection Type To Structural Member[4] | Rod Size (mm) | Max. Length for Rods (mm) |
|---|---|---|---|---|---|---|---|---|
| 63.5 | 180.0 | 101.6×101.6×2.0 (F) | 762 | 41.3×82.6×2.75 | 12.7 | D | 22.2 | 1111 |
| 76.2 | 245.5 | 101.6×101.6×2.0 (G) | 762 | 41.3×82.6×2.75 | 15.9 | D | 25.4 | 1270 |
| 101.6 | 370.5 | 101.6×101.6×2.0 (F) | 965 | 41.3×82.6×2.75 | 15.9 | D | 22.2 | 1111 |
| 127.0 | 423.6 | 101.6×101.6×2.0 (F) | 914 | 41.3×82.6×2.75 | 15.9 | D | 22.2 | 1111 |
| 152.4 | 429.6 | 101.6×101.6×2.0 (G) | 813 | 41.3×82.6×2.75 | 15.9 | D | 22.2 | 1111 |
| 203.2 | 457.3 | 101.6×101.6×2.0 (G) | 686 | 41.3×82.6×2.75 | 15.9 | D | 25.4 | 1270 |

**Table 6-8M Schedule for Bracing Pipes on Trapeze, SHL B**

*NOTES:*

1. This schedule is based on four equal-sized pipe arrangements for pipe 127 mm and smaller. The schedule also limits the number for 152.4 mm pipes to three and 203.2 mm pipes to two. However, any combination of pipes can be used if the total combined weight of the pipes on a trapeze is equal to or less than the maximum dead load noted and the maximum trapeze span and size of diagonal braces noted in the schedule are maintained.

2. Provide transverse and longitudinal braces at 12.2 m maximum for pipes smaller than 101.6 mm and at 6.1 m maximum for pipes 101.6 to 203.2 mm. Install one transverse brace and one longitudinal brace at each end of the trapeze. *See* Table 3-2 for cable size.

3. Place standard flat washer between sheet metal angles and nut.

4. *See* Table 9-1 for "Connection Type" to structural supporting member.

5. Framing Channel may be used as an alternative to the structural members in the table.

| Pipe Size (in.) | Max. Dead Load on Support | Vertical Legs Angles (in.) | Trapeze Span | Horizontal Beam[2] (in.) | Diagonal Brace[3] Angles (in.) | Machine Bolt[4] (in.) | Connection Type[5] |
|---|---|---|---|---|---|---|---|
| 2.5 | 395 | L2×2×16ga | 2′6 | L4×4×14ga | L2.5×2.5×16ga | ½ | D |
| 3 | 540 | L2.5×2.5×16ga | 2′6 | L2.5×2.5×12ga | L3×3×16ga | ⅝ | D |
| 4 | 815 | L2×2×16ga | 3′2 | L2.5×2.5×12ga | L2.5×2.5×16ga | ½ | D |
| 5 | 932 | L2.5×2.5×16ga | 3′0 | L2.5×2.5×12ga | L3×3×16ga | ⅝ | D |
| 6 | 945 | L2.5×2.5×16ga | 2′8 | L2.5×2.5×12ga | L3×3×16ga | ⅝ | D |
| 8 | 1006 | L3×3×16ga | 2′3 | L2.5×2.5×12ga | L3×3×16ga | ⅝ | D |

**Table 6-9 Floor Supported Pipes, SHL B**

*NOTES:*

1. This schedule is based on four equal-sized pipe arrangements for pipe 5 in. and smaller. The schedule also limits the number for 6 in. pipes to three and 8 in. pipes to two. However, any combination of pipes can be used if the total combined weight of the pipes on a trapeze is equal to or less than the maximum dead load noted and the maximum trapeze span and size of diagonal braces noted in the schedule are maintained.
2. *See* Figure 10-12 for trapeze detail.
3. Provide transverse and longitudinal braces at 40 ft maximum for pipes smaller than 4 in. and at 20 ft maximum for pipe 4 to 8 in. Install one longitudinal brace at each leg of the support.
4. Place standard flat washer between sheet metal angles and nut.
5. *See* Table 9-1 for “Connection Type” to structural supporting member.
6. Framing Channel may be used as an alternative to the structural members in the table.

| Pipe Size (mm) | Max. Dead Load on Support (kg) | Vertical Legs Angles (mm) | Trapeze Span (mm) | Horizontal Beam[2] (mm) | Diagonal Brace[3] Angles (mm) | Machine Bolt[4] (mm) | Connection Type[5] |
|---|---|---|---|---|---|---|---|
| 63.5 | 179.6 | 50.8×50.8×1.61 | 762 | 101.6×101.6×2.0 | 63.5×63.5×1.61 | 12.7 | D |
| 76.2 | 245.5 | 63.5×63.5×1.61 | 762 | 63.5×63.5×2.75 | 76.2×76.2×1.61 | 15.9 | D |
| 101.6 | 370.5 | 50.8×50.8×1.61 | 965 | 63.5×63.5×2.75 | 63.5×63.5×1.61 | 12.7 | D |
| 127.0 | 423.6 | 63.5×63.5×1.61 | 914 | 63.5×63.5×2.75 | 76.2×76.2×1.61 | 15.9 | D |
| 152.4 | 429.6 | 63.5×63.5×1.61 | 813 | 63.5×63.5×2.75 | 76.2×76.2×1.61 | 15.9 | D |
| 203.2 | 457.3 | 76.2×76.2×1.61 | 286 | 63.5×63.5×2.75 | 76.2×76.2×1.61 | 15.9 | D |

**Table 6-9M Floor Supported Pipes, SHL B**

*NOTES:*

1. This schedule is based on four equal-sized pipe arrangements for pipe 127 mm and smaller. The schedule also limits the number for 152.4 mm pipes to three and 203.2 mm pipes to two. However, any combination of pipes can be used if the total combined weight of the pipes on a trapeze is equal to or less than the maximum dead load noted and the maximum trapeze span and size of diagonal braces noted in the schedule are maintained.

2. *See* Figure 10-12 for trapeze detail.

3. Provide transverse and longitudinal braces at 12.2 m maximum for pipes smaller than 101.6 mm and at 6.1 m maximum for pipes 101.6 to 203.2 mm. Install one longitudinal brace at each leg of the support.

4. Place standard flat washer between sheet metal angles and nut.

5. *See* Table 9-1 for "Connection Type" to structural supporting member.

6. Framing Channel may be used as an alternative to the structural members in the table.

7. The above structural members are designed for seismic loads only. If the piping is located external to the building, wind loads may need to be considered.

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CHAPTER 7

# TABLES FOR SEISMIC HAZARD LEVEL C

## 7.1 USE OF TABLES

The tables in Chapter 7 are for use when $C_s = \frac{F_p}{W_p} = 0.50$ or less. (*See* Appendix A.)

| Duct Size W×D[1] (in.) | Vertical Hangers Angles (in.) | Diagonal Braces Angle Pipe (Cable Size)[2] (in.) | Horizontal Braces Angles (in.) | Bolt Size (in.) | Connection Type to Structural Members[3] | Max. Wt. Ft[4] (lb) |
|---|---|---|---|---|---|---|
| 30×30 | L2×2×16ga | L2.5×2.5×16ga (A) | L2×2×16ga | ⅜ | A | 17 |
| 42×42 | L2×2×16ga | L4×4×16ga (B) | L2×2×16ga | ⅜ | B | 29 |
| 54×54 | L2×2×16ga | L4×4×14ga (D) | L2×2×16ga | ½ | C | 46 |
| 60×60 | L2×2×16ga | L4×4×12ga (D) | L2×2×16ga | ½ | C | 54 |
| 84×84 | L2.5×2.5×16ga | 2 ½ Pipe (G) | L2.5×2.5×16ga | ⅝ | D | 103 |
| 96×96 | L3×3×16ga | 2 ½ Pipe (H) | L2.5×2.5×16ga | ¾ | D | 129 |
| 54×28 | L2×2×16ga | L2.5×2.5×16ga (C) | L2×2×16ga | ⅜ | C | 34 |
| 60×30 | L2×2×16ga | L4×4×14ga (C) | L2×2×16ga | ⅜ | C | 39 |
| 84×42 | L2×2×16ga | L3×3×12ga (F) | L2.5×2.5×16ga | ⅝ | D | 74 |
| 96×48 | L2.5×2.5×16ga | L3×3×12ga (G) | L2.5×2.5×16ga | ⅝ | D | 97 |
| 108×54 | L2.5×2.5×16ga | L4×4×12ga (G) | L3×3×16ga | ⅝ | D | 110 |
| 120×60 | L3×3×16ga | L4×4×12ga (H) | L4×4×16ga | ¾ | D | 121 |

**Table 7-1 Side Bracing For Rectangular Ducts, SHL C, L=2 ft 8 in. (Max.)**

*NOTES:*

1. The ducts' maximum dimensions will govern what bracing is required. Example: A 72 × 30 in. duct will be braced like an 84 × 42 in. duct.
2. Provide transverse bracing at 30 ft and longitudinal bracing at 60 ft. *See* Table 3-2 for cable size.
3. *See* Table 9-1 for "Connection Type" to structural supporting members.
4. Maximum weight of duct or combinations of ducts is per linear foot. For ducts weighing more than the maximum weight per foot, use the next higher duct size.

| Duct Size W×D[1] (mm) | Vertical Hangers Angles (mm) | Diagonal Braces Angle Pipe (Cable Size)[2] (mm) | Horizontal Braces Angles (mm) | Bolt Size (mm) | Connection Type to Structural Members[3] | Max. Wt. Per Meter[4] (kg) |
|---|---|---|---|---|---|---|
| 750×750 | 50.8×50.8×1.61 | 63.5×63.5×1.61 (A) | 50.8×50.8×1.61 | 9.5 | A | 25.3 |
| 1000×1000 | 50.8×50.8×1.61 | 101.6×101.6×1.61 (B) | 50.8×50.8×1.61 | 9.5 | B | 43.2 |
| 1300×1300 | 50.8×50.8×1.61 | 101.6×101.6×2.0 (D) | 50.8×50.8×1.61 | 12.7 | C | 68.6 |
| 1500×1500 | 50.8×50.8×1.61 | 101.6×101.6×2.75 (D) | 50.8×50.8×1.61 | 12.7 | C | 80.5 |
| 2100×2100 | 63.5×63.5×1.61 | 63.5 Pipe (G) | 63.5×63.5×1.61 | 15.9 | D | 153.6 |
| 2400×2400 | 76.2×76.2×1.61 | 63.5 Pipe (H) | 63.5×63.5×1.61 | 19.1 | D | 192.4 |
| 1300×700 | 50.8×50.8×1.61 | 63.5×63.5×1.61 (C) | 50.8×50.8×1.61 | 9.5 | C | 50.7 |
| 1500×750 | 50.8×50.8×1.61 | 101.6×101.6×2.0 (C) | 50.8×50.8×1.61 | 9.5 | C | 58.2 |
| 2100×1000 | 50.8×50.8×1.61 | 76.2×76.2×2.75 (F) | 63.5×63.5×1.61 | 15.9 | D | 110.4 |
| 2400×1200 | 63.5×63.5×1.61 | 76.2×76.2×2.75 (G) | 63.5×63.5×1.61 | 15.9 | D | 144.7 |
| 2700×1300 | 63.5×63.5×1.61 | 101.6×101.6×2.75 (G) | 76.2×76.2×1.61 | 15.9 | D | 164.0 |
| 3000×1500 | 76.2×76.2×1.61 | 101.6×101.6×2.75 (H) | 101.6×101.6×1.61 | 19.1 | D | 180.4 |

**Table 7-1M Side Bracing For Rectangular Ducts, SHL C, L=0.81m (Max.)**

*NOTES:*

1. The ducts' maximum dimensions will govern what bracing is required. Example: An 1800 × 750 mm duct will be braced like a 2100 × 1000 mm duct.
2. Provide transverse bracing at 9.1 m and longitudinal bracing at 18.2 m. *See* Table 3-2 for cable size.
3. *See* Table 9-1 for "Connection Type" to structural supporting members.
4. Maximum weight of duct or combinations of ducts is per linear meter. For ducts weighing more than the maximum weight per meter, use the next higher duct size.