

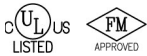
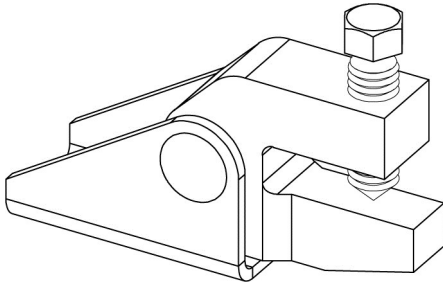


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# SEISMIC BRACING

**FIG. 030**

## C-CLAMP STRUCTURAL ATTACHMENT



**Function:** Designed for bracing pipe against sway and seismic disturbances. Universal swivel design allows for attachment at any surface angle combined with concentric loading. Structure attachment fitting designed to use 1" thru 2" SCH 40 pipe, structural steel, and PHD 12 gauge strut channel (1001 & 1201) as sway bracing elements. No bracing member thicker than  $\frac{3}{8}$ " can be used in conjunction with this product. Utilize the Fig. 030 with a PHD Manufacturing pipe attachment fitting and a bracing element to form a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

**Size:**  $\frac{1}{2}$ " mounting hole. Braces up to 8" Pipe MAX

**Material:** Ductile iron and carbon steel

**Finish:** Electro-galvanized

**Install:** Mount device to structure then insert brace element into fitting against back of jaw. Tighten set screw finger tight, then tighten until hex head breaks off. Adjust attachment to proper brace angle.

**Approvals:** Underwriters Laboratories listed for US and Canada and Factory Mutual approved. Listed for use with NFPA fastener tables and PHD sway brace components only.

**Ordering:** Specify figure number.

| UL Maximum Design Loads (Up to 8" Pipe)<br>Lateral & Longitudinal Assemblies |                           |                 |      |        |          |        |
|--|---------------------------|-----------------|------|--------|----------|--------|
| Brace Member   | Member Thickness          | Member Length   | lbs. | kN     | Wt. Each |        |
|  |                           |                 |      |        | lbs.     | kg     |
| 1" Thru 2" Pipe  | SCH 40                    | Refer to NFPA13 | 2015 | (8.96) | 1.23     | (0.56) |
| Structural Steel   | $\frac{3}{8}$ " thick MAX | Refer to NFPA13 | 2015 | (8.96) | 1.23     | (0.56) |
| 1001 Series Strut  | 12 Ga.                    | See Chart Below | 2015 | (8.96) | 1.23     | (0.56) |
| 1201 Series Strut  | 12 Ga.                    | See Chart Below | 2015 | (8.96) | 1.23     | (0.56) |

| FM Maximum Design Load<br>For Bracing SCH 10, 40 & Flow Pipe |                                   |                                     |      |         |
|--|-----------------------------------|-------------------------------------|------|---------|
| Brace Member   |                                   | Brace Angle From Vertical (Degrees) | lbs. | kN      |
| 1" Thru 2" SCH 40 Pipe                                       | (GB/T3091, EN10255H, or JISG3454) | 30°-44°                             | 1270 | (5.64)  |
|  |                                   | 45°-59°                             | 2040 | (9.07)  |
|  |                                   | 60°-74°                             | 2450 | (10.89) |
|  |                                   | 75°-90°                             | 2740 | (12.18) |
| $\frac{1}{4}$ " Thru $\frac{3}{8}$ " Thick Structural Steel  |                                   | 30°-44°                             | 900  | (4.00)  |
|  |                                   | 45°-59°                             | 1280 | (5.69)  |
|  |                                   | 60°-74°                             | 1570 | (6.98)  |
| PHD 12 Gauge Strut Channel 1001 & 1201                       |                                   | 75°-90°                             | 1750 | (7.78)  |
|  |                                   | 30°-44°                             | 1070 | (4.75)  |
|  |                                   | 45°-59°                             | 1440 | (6.40)  |
|  |                                   | 60°-74°                             | 1740 | (7.73)  |
|  |                                   | 75°-90°                             | 1940 | (8.62)  |

| Strut Fig. # | PHD Strut Channel Maximum Horizontal Load 90° From Vertical |         |       |          |      |         |      |          |      |        |      |          |     |        |
|--------------|---|---------|-------|----------|------|---------|------|----------|------|--------|------|----------|-----|--------|
|              | r   |         | l/r = |          | 100  |         |      | 200      |      |        | 300  |          |     |        |
|              |   |         |       |          | Max  | lbs.    | kN   | Max      | lbs. | kN     | Max  | lbs.     | kN  |        |
| 1001         | 0.580   | (14.73) | 58"   | (1473.2) | 4670 | (20.77) | 116" | (2946.4) | 1165 | (5.18) | 174" | (4419.6) | 518 | (2.30) |
| 1201         | 0.297   | (7.54)  | 29"   | (736.6)  | 3260 | (14.50) | 59"  | (1498.6) | 785  | (3.49) | 89"  | (2260.6) | 345 | (1.53) |

| FIG. 031 Horizontal Prying Factors Per NFPA 13-2016 |               |               |               |               |               |               |               |               |               |  |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--|
| Brace Orientation*                                  | A             | B             | C             | D             | E             | F             | G             | H             | I             |  |
| Brace Angle**                                       | 30° - 44°     | 45° - 59°     | 60° - 90°     | 30° - 44°     | 45° - 59°     | 60° - 90°     | 30° - 44°     | 45° - 59°     | 60° - 90°     |  |
| Prying Factor (Pr)                                  | 2.396 (60.85) | 1.098 (27.90) | 1.285 (32.64) | 1.677 (42.60) | 1.353 (34.36) | 2.125 (53.98) | 2.570 (65.28) | 1.817 (46.16) | 1.484 (37.69) |  |

\* Brace Orientation per NFPA 13-2016 Figure 9.3.5.12.1.

\*\* Brace Pipe Angles are determined from vertical.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

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**FIG. 030 C-CLAMP STRUCTURAL ATTACHMENT**

- Pipe Braced:** 8” Pipe MAX  
**Bracing:** 1” thru 2” SCH 40 pipe, structural steel, and PHD 12 gauge strut channel (1001 & 1201)  
**Function:** Designed for bracing pipe against sway and seismic disturbances. Universal swivel design allows for attachment at any surface angle combined with concentric loading. Structure attachment fitting designed to use 1” thru 2” SCH 40 pipe, structural steel, and PHD 12 gauge strut channel (1001 & 1201) as sway bracing elements. No bracing member thicker than 3/8” can be used in conjunction with this product. Utilize the Fig. 030 with a PHD Manufacturing pipe attachment fitting and a bracing element to form a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer’s installation instructions.  
**Approvals:** Underwriters Laboratories listed for US and Canada  
 Factory Mutual approved  
 Listed for use with NFPA13 fastener tables and PHD sway brace components only  
**Material:** Ductile Iron and Low Carbon Steel  
**Installation:** Mount device to structure then insert brace element into fitting against back of jaw. Tighten set screw finger tight, then tighten until hex head breaks off. Adjust attachment to proper brace angle.

| UL Maximum Design Loads (Up to 8” Pipe) |                  |                 |      |
|---|------------------|-----------------|------|
| Brace Member                            | Member Thickness | Member Length   | lbs. |
| 1” Thru 2” Pipe                         | SCH 40           | Refer to NFPA13 | 2015 |
| NFPA13 Structural Steel                 | 3/8” thick MAX   | Refer to NFPA13 | 2015 |
| 1001 Series Strut                       | 12 Ga.           | See Chart Below | 2015 |
| 1201 Series Strut                       | 12 Ga.           | See Chart Below | 2015 |

| FM Maximum Design Load<br>For Bracing SCH 10, 40 & Flow Pipe |                                   |                                     |      |
|--|-----------------------------------|-------------------------------------|------|
| Brace Member   |                                   | Brace Angle From Vertical (Degrees) | lbs. |
| 1” Thru 2” SCH 40 Pipe                                       | (GB/T3091, EN10255H, or JISG3454) | 30°-44°                             | 1270 |
|  |                                   | 45°-59°                             | 2040 |
|  |                                   | 60°-74°                             | 2450 |
|  |                                   | 75°-90°                             | 2740 |
| 1/4” Thru 3/8” Thick Structural Steel                        |                                   | 30°-44°                             | 900  |
|  |                                   | 45°-59°                             | 1280 |
|  |                                   | 60°-74°                             | 1570 |
| PHD 12 Gauge Strut Channel 1001 & 1201                       |                                   | 75°-90°                             | 1750 |
|  |                                   | 30°-44°                             | 1070 |
|  |                                   | 45°-59°                             | 1440 |
|  |                                   | 60°-74°                             | 1740 |
|  |                                   | 75°-90°                             | 1940 |

| Strut Fig. # | Max. Horizontal Load (lbs.) 90° From Vertical |       |     |      |      |      |      |     |
|--------------|---|-------|-----|------|------|------|------|-----|
|              | r   | l/r = | 100 | 200  | 300  |      |      |     |
| 1001         | 0.580   |       | 58” | 4670 | 116” | 1165 | 174” | 518 |
| 1201         | 0.297   |       | 29” | 3260 | 59”  | 785  | 89”  | 345 |

NOTE: Use NFPA13 table “Allowable Horizontal Load on Brace Assemblies Based on the Weakest Component of the Brace Assembly” reduction factors for maximum loads at varying angles.

Refer to [www.phd-mfg.com](http://www.phd-mfg.com) regarding further strut channel details

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