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RESEARCH REPORT: RR 25949
(CSI # 15060)
Expires: June 1, 2015
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Code: 2014LABC

GENERAL APPROVAL – 4”, 6”, and 8” Clevis Hanger Assembly and Seismic Bracing Attachment Brackets of Support on Non Structural Components and Seismic Hold-down Clamps for Cable Tray.

DETAILS

1. 4”, 6”, and 8” Clevis Hanger Assembly:
Each size assembly consists of the following components:
   a) Fig. 1 CBS cross bolt spacer and Fig. B3100 Standard Clevis Hanger.
   b) 5/8” threaded rod for the 4” standard clevis hanger, 3/4” threaded rod for the 6” and 8” standard clevis hanger.
   c) Fig. 980 sway brace attachment

The maximum allowable transverse load applied at the center of the pipe for each assembly is shown in Table 1.

2. Fig. 985 Mechanical Fast Clamp:
The Fig. 985 mechanical fast clamp is a low carbon steel used for attachment of seismic bracing to pipe hanger or trapeze. This clamp fits a rod size of 1/2” through 5/8” in diameter.

The maximum allowable load applied to a bracing member attached to the clamp at 30 or 45 degrees from a vertical plane are shown in Table 2.

3. Fig. 986 Mechanical Fast Clamp:
The Fig. 986 mechanical fast clamp is a low carbon steel used for attachment of seismic bracing to pipe hanger or trapeze. This clamp fits a rod size of ½” in diameter, or ½” bolt to attach to the structure.
Cooper B-Line I TOLCO
RE: 4”, 6”, and 8” Clevis Hanger Assembly and Seismic Bracing Attachment Brackets of Support on Non Structural Components and Seismic Hold- down Clamps for Cable Tray

The maximum allowable load applied to a bracing member attached to the clamp at 30 or 45 degrees from a vertical plane are shown in Table 2.

4. Fig. 981 Sway Brace Attachment:
The Fig. 981 sway brace attachment is a low carbon steel multi-functional attachment to hanger rod, strut or structural steel in a lateral or longitudinal brace assembly. The TOLCO Fig. 981 was designed to be used with B-Line B22 solid channel or steel pipe.

The maximum allowable load applied to a bracing member attached to the Fig. 981 sway brace at 30 or 45 degrees from a vertical plane are shown in Table 2.

5. Fig. 990 Cable Sway Brace Attachment:
The cable sway brace attachment is a carbon steel material with pre galvanized finish and is used to attach min 3/16” diameter pre-stretched galvanized aircraft cable to structure or hanger with a rod size of 1/2” in diameter, or ½” bolt to attach to the structure.

The maximum allowable load applied to the aircraft cable attached to the clamp at 30 or 45 degrees from a vertical plane are shown in Table 2.

6. Fig. 991 Cable Sway Brace Attachment:
The cable sway brace attachment is a carbon steel material with pre galvanized finish and is used to attach min 3/16” diameter pre-stretched galvanized aircraft cable to structure or hanger with a rod size of 3/8” through 5/8” in diameter.

The maximum allowable load applied to the aircraft cable attached to the clamp at 30 or 45 degrees from a vertical plane are shown in Table 2.

7. Fig. 9ZN-1205, 9ZN-1208, 9ZN-1241 & B335 Hold Down Clamps:
The hold down clamps hold B-Line branded cable tray to trapezes’ utilizing B-Line branded strut.

The Maximum allowable loads applied to the hold down clamps are shown in Table 3.
Table 1. Allowable Values (lbf) for Pipe Hangers with Clevis Assembly.

<table>
<thead>
<tr>
<th>No.</th>
<th>Configuration</th>
<th>Brace Orientation from Vertical Plane</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>45 degree</td>
</tr>
<tr>
<td>1</td>
<td>4&quot; Clevis Hanger/Fig. 980</td>
<td>303</td>
</tr>
<tr>
<td>2</td>
<td>6&quot; Clevis Hanger/Fig. 980</td>
<td>665</td>
</tr>
<tr>
<td>3</td>
<td>8&quot; Clevis Hanger/Fig. 980</td>
<td>450</td>
</tr>
</tbody>
</table>

Note
1. The allowable loads are for design loads applied in the transverse direction at the center of the pipes.
2. Braces in the assembly and threaded rods & their connection to structure above must be designed per 2014LABC.
3. A factor of safety of 3.0 was applied to the lowest of three ultimate loades.

Table 2. Allowable Values (lbf) for Brace Attachments.

<table>
<thead>
<tr>
<th>No.</th>
<th>Configuration</th>
<th>Brace Orientation from Vertical Plane</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>45 degree</td>
</tr>
<tr>
<td>1</td>
<td>Fig. 981 with B-Line B22 Brace and 1/2&quot; diameter rod.</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>Fig. 981 with B-Line B22 Brace and 3/4&quot; diameter rod.</td>
<td>1263</td>
</tr>
<tr>
<td>3</td>
<td>Fig. 985 with B-Line B22 Brace and 5/8&quot; diameter rod.</td>
<td>813</td>
</tr>
<tr>
<td>4</td>
<td>Fig. 986 with B-Line B22 Brace and 1/2&quot; diameter rod.</td>
<td>786</td>
</tr>
<tr>
<td>5</td>
<td>Fig. 990 with 3/16&quot; diameter cable and 1/2&quot; diameter rod.</td>
<td>1386</td>
</tr>
<tr>
<td>6</td>
<td>Fig. 991 with 3/16&quot; diameter cable and 1/2&quot; diameter rod.</td>
<td>1023</td>
</tr>
</tbody>
</table>

Note
1. The allowable values are for the brace attachments only. Braces and other components must be designed per 2014 LABC.
2. A factor of safety of 3.0 was applied to the lowest of three ultimate loades.
Cooper B-Line I TOLCO
RE: 4”, 6”, and 8” Clevis Hanger Assembly and Seismic Bracing Attachment Brackets of Support on Non Structural Components and Seismic Hold-down Clamps for Cable Tray

Table 3. Allowable Values (lbf) for Hold Down Clamps

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Number</th>
<th>Design Load</th>
<th>Pt</th>
<th>PI</th>
<th>Design Load</th>
<th>Pt</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9ZN 1205</td>
<td>570</td>
<td>482</td>
<td>154</td>
<td>570</td>
<td>482</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>9ZN 1208</td>
<td>570</td>
<td>482</td>
<td>154</td>
<td>570</td>
<td>482</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>9G 1241</td>
<td>1031</td>
<td>1239</td>
<td>702</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>B355</td>
<td>1195</td>
<td>502</td>
<td>168</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note
1. The allowable values are based on clamps being used in pairs.
2. The allowable values are applicable only with B-Line Strut
3. A factor of safety of 3.0 was applied to the average of three ultimate loads.
4. Load directions for design load, Pt and PI are shown in detail HC01

The approval is subject to the following conditions:

1. Allowable capacities of brace attachments and clevis hanger assemblies are listed in Tables 1 and 2.

2. Existing ceiling, walls, or other structures that support hanger rods and brace attachments shall be evaluated by an architect, civil or structural engineer licensed in the State of California. The plans and calculations shall be submitted to structural plan check for review and approval.

3. Approval of the supported systems is outside the scope of the research report.

4. Calculations for the Design of hanger rods and brace elements in accordance with the 2014 Los Angeles City Building Code shall be submitted to structural plan check for review and approval.

5. Installation of the brace system shall be in accordance with the manufacturer’s instructions.

6. The design of the connection used to attach the clamps and sway braces to the supporting structure shall be evaluated by an architect, civil or structural engineer licensed in the State of California. The plans and calculations shall be submitted to structural plan check for review and approval.

7. The mechanical fast clamps, hold down clamps, and the sway braces shall not be used to resist forces produced by the effects of gravity.

8. The use of the clamps and sway braces is limited to the support of Non Structural components.

9. The design of the clamps and sway braces shall be in accordance with Chapter 13 of ASCE 7-10.
10. Cable Sway braces must be used in opposing pairs.

11. The brace attachments listed in Table 2 are only approved as specified under the Details section of this Research Report.

12. The allowable loads shall not be increased for duration of load.

**DISCUSSION**

The report is in compliance with the 2014 Los Angeles City Building Code.

The approval is based on load tests.

For this General Approval to be valid on any individual construction project in the City of Los Angeles, an engineer or inspector of the Department of Building and Safety must make a determination that all conditions of the General Approval required to provide equivalency have been met in the case of each construction project under consideration.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

____________________________________

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Phone- 213-202-9812
Fax- 213-202-9943

Attachments: detail drawings (15 Pages)
**TRANSVERSE RIGID BRACING FOR SINGLE HUNG PIPE OR CONDUIT WITH CLEVIS HANGER**

**DATE:** September 24, 2012

**1375 SAMPSON AVENUE | CORONA, CA. 92879**

**P:** (951) 737-5599 | **F:** (951) 737-0330

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**Fig. 980 Sway Brace Attachment.**

To Install: Place the Fig. 980 onto the "bracing member". Tighten the set screw until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

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**Fig. 990: Table for Pipe Sizes**

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX TRANSVERSE LOAD (lbs)</td>
<td>303</td>
<td>665</td>
<td>450</td>
</tr>
<tr>
<td>SAFETY FACTOR: 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Fig. 1 CBS Cross Bolt Spacer.**

**TOLCO Fig. 980 Sway Brace Attachment. Tighten until break-off**

**TOLCO Fig. 1 CBS Cross Bolt Spacer.**

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TRANSVERSE RIGID BRACING FOR SINGLE HUNG PIPE OR CONDUIT WITH CLEVIS HANGER

TOLCO FIG. 99 OR B-LINE ATR ALL THREAD ROD.

IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED

TOLCO FIG. 1 CBS CROSS BOLT SPACER.

TOLCO FIG. 980 SWAY BRACE ATTACHMENT. TIGHTEN UNTIL BREAK-OFF

TOLCO FIG. 980 OR B-LINE B3100 CLEVIS HANGER.

To Install: Place the Fig. 980 onto the "bracing member". Tighten the set screw until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>310</td>
<td>503</td>
<td>390</td>
</tr>
</tbody>
</table>

MAX TRANSVERSE LOAD (lbs)
SAFETY FACTOR: 3

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A</th>
<th>B</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>980-1/2</td>
<td>4 1/2&quot;</td>
<td>1 7/8&quot;</td>
<td>17/32&quot;</td>
</tr>
<tr>
<td>980-5/8</td>
<td>5 1/4&quot;</td>
<td>1 7/8&quot;</td>
<td>11/32&quot;</td>
</tr>
<tr>
<td>980-3/4</td>
<td>5 1/4&quot;</td>
<td>1 7/8&quot;</td>
<td>13/32&quot;</td>
</tr>
</tbody>
</table>

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If $KL/R$ of rod is greater than 130, rod stiffeners may be required.

To install: Slip the open side of the 985 yoke onto the all-thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

** Revised/*Deleted by the City of Los Angeles
TRANSVERSE RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

**TOLCO FIG. 99 OR B-LINE ATR ALL THREAD ROD.**

**IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED**

**TOLCO FIG. 986 MECHANICAL FAST CLAMP BRACE ATTACHMENT**

**B-LINE B22 SOLID CHANNEL**

**TOLCO FIG. 985 MECHANICAL FAST CLAMP BRACE ATTACHMENT**

**B-LINE SOLID OR PUNCHED CHANNEL. PUNCHED HOLE DIAMETER 1/16" LARGER THAN ROD DIAMETER.**

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**FIG. 985**

<table>
<thead>
<tr>
<th><strong>Part Number</strong></th>
<th><strong>Rod Size</strong></th>
<th><strong>A (in)</strong></th>
<th><strong>B (in)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>985-S</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>2&quot;</td>
<td>1/2&quot;</td>
</tr>
</tbody>
</table>

**LOAD PER BRACE (lbs) SAFETY FACTOR: 3**

**LOAD PER BRACE (lbs)**

**SAFETY FACTOR: 3**

**FIG. 986**

**LOAD PER BRACE (lbs) SAFETY FACTOR: 3**

**LOAD PER BRACE (lbs)**

**SAFETY FACTOR: 3**

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**To Install:** Slip the open side of the 985 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

---

**IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED**

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**Revised/"Deleted by the City of Los Angeles**
To Install: Slip the open side of the 985 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 arm and adjust to desired length ensuring the channel passes minimum engagement indicator. Tighten set screw until head breaks off.

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LONGITUDINAL RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

** TOLCO FIG. 986 MECHANICAL FAST CLAMP BRACE ATTACHMENT

- B-LINE B22 SOLID CHANNEL

TOLCO FIG. 985 MECHANICAL FAST CLAMP BRACE ATTACHMENT

- B-LINE SOLID OR PUNCHED CHANNEL. PUNCHED HOLE DIAMETER 1/16" LARGER THAN ROD DIAMETER.

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TRANSVERSE RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

**TOLCO FIG. 99 OR B-LINE ATR ALL THREAD ROD.**

**IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED**

**LOAD PER BRACE (lbs)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size Range</th>
<th>A (in. / mm)</th>
<th>B (in. / mm)</th>
<th>C (in. / mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>981-S</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>5 1/8&quot; (130.2)</td>
<td>4 1/8&quot; (104.8)</td>
<td>1 1/4&quot; (31.7)</td>
</tr>
<tr>
<td>981-L</td>
<td>3/4&quot; &amp; 7/8&quot;</td>
<td>5 1/8&quot; (130.2)</td>
<td>4 1/8&quot; (104.8)</td>
<td>1 1/4&quot; (31.7)</td>
</tr>
</tbody>
</table>

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

**TOLCO FIG. 980 SWAY BRACE ATTACHMENT. TIGHTEN UNTIL BREAK-OFF**

**TOLCO FIG. 981 SWAY BRACE ATTACHMENT**

**B-LINE B22 SOLID CHANNEL OR STEEL PIPE**

**B-LINE SOLID OR PUNCHED CHANNEL. PUNCHED HOLE DIAMETER 1/16" LARGER THAN ROD DIAMETER.**

**FIG. 981**

**LOAD PER BRACE (lbs)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size Range</th>
<th>A (in. / mm)</th>
<th>B (in. / mm)</th>
<th>C (in. / mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>981-S</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>5 1/8&quot; (130.2)</td>
<td>4 1/8&quot; (104.8)</td>
<td>1 1/4&quot; (31.7)</td>
</tr>
<tr>
<td>981-L</td>
<td>3/4&quot; &amp; 7/8&quot;</td>
<td>5 1/8&quot; (130.2)</td>
<td>4 1/8&quot; (104.8)</td>
<td>1 1/4&quot; (31.7)</td>
</tr>
</tbody>
</table>

**TO INSTALL:** Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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FIG. 981

LOAD PER BRACE (lbs)
SAFETY FACTOR: 3
1226

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size Range</th>
<th>A (in) (mm)</th>
<th>B (in) (mm)</th>
<th>C (in) (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>981-S</td>
<td>¼&quot; thru ½&quot;</td>
<td>5½&quot; (138.3)</td>
<td>4½&quot; (114.3)</td>
<td>1½&quot; (38.1)</td>
</tr>
<tr>
<td>981-L</td>
<td>¾&quot; &amp; 7/8&quot;</td>
<td>5½&quot; (138.3)</td>
<td>4½&quot; (114.3)</td>
<td>1½&quot; (38.1)</td>
</tr>
</tbody>
</table>

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

TOLCO FIG. 980
SWAY BRACE ATTACHMENT.
TIGHTEN UNTIL BREAK-OFF

B-LINE B22 SOLID CHANNEL
OR STEEL PIPE

TOLCO FIG. 981
SWAY BRACE ATTACHMENT

B-LINE SOLID OR PUNCHED
CHANNEL. PUNCHED HOLE DIAMETER 1/16" LARGER THAN ROD DIAMETER.

IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED

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LONGITUDINAL RIGID BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

TOLCO FIG. 981
SWAY BRACE ATTACHMENT

B-LINE B22 SOLID CHANNEL OR STEEL PIPE

B-LINE SOLID OR PUNCHED CHANNEL. PUNCHED HOLE DIAMETER 1/16" LARGER THAN ROD DIAMETER.

LOAD PER BRACE (lbs)
SAFETY FACTOR: 3

FIG. 981

LOAD PER BRACE (lbs) SAFETY FACTOR: 3

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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TOLCO FIG. 99 OR B-LINE ATR ALL THREAD ROD.

IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED.

LOAD PER BRACE (lbs)
SAFETY FACTOR: 3

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size Range</th>
<th>A (in)</th>
<th>B (in)</th>
<th>C (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>981-S</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>5 1/8&quot;</td>
<td>4 1/8&quot;</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>981-L</td>
<td>7/8&quot; &amp; 7/8&quot;</td>
<td>5 1/8&quot;</td>
<td>4 1/8&quot;</td>
<td>1 1/4&quot;</td>
</tr>
</tbody>
</table>

To Install: Slip the open side of the 981 yoke onto the all thread rod above the top of the trapeze. Tighten set screw until head breaks off. Secure with hex nut. Insert channel brace into the 981 jaw and tighten set screw until head breaks off.

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**TRANSVERSE CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT**

**FIG. 991**

**MIN. 3/16" CABLE**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size</th>
<th>Cable Diameter (mm)</th>
<th>A (in.)</th>
<th>B (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>991</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>14.8</td>
<td>5&quot; (127)</td>
<td>2 1/16&quot; (51.1)</td>
</tr>
<tr>
<td></td>
<td>1/2&quot;</td>
<td>15.9</td>
<td>5&quot; (127)</td>
<td>2 3/8&quot; (60.3)</td>
</tr>
</tbody>
</table>

To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

**FIG. 990**

**MIN. 3/16" CABLE**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A (in.)</th>
<th>D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>990-1/2</td>
<td>5&quot; (127)</td>
<td>1 1/2&quot; (38.1)</td>
</tr>
<tr>
<td>990-5/8</td>
<td>6&quot; (152)</td>
<td>1 3/4&quot; (44.5)</td>
</tr>
<tr>
<td>990-3/4</td>
<td>6&quot; (152)</td>
<td>1 3/4&quot; (44.5)</td>
</tr>
</tbody>
</table>

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.

**TOLCO FIG. 991 CABLE SWAY BRACE ATTACHMENT**

- PRESTRETCHED GALVANIZED AIR CRAFT CABLE W/ 7 X 19 STRAND CORE
- B-LINE SOLID OR PUNCHED CHANNEL PUNCHED HOLE DIAMETER 1/16" LARGER THAN ROD DIAMETER.

**TOLCO FIG. 990 CABLE SWAY BRACE ATTACHMENT**

- IF KL/R OF ROD IS GREATER THAN 130, ROD STIFFENERS MAY BE REQUIRED
To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.
LONGITUDINAL CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

**4 LONG 45**

**FIG. 991**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size</th>
<th>Cable Diameter (in. (mm))</th>
<th>A (in. (mm))</th>
<th>B (in. (mm))</th>
</tr>
</thead>
<tbody>
<tr>
<td>991</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>14.8 (3.77)</td>
<td>5&quot; (127)</td>
<td>2 1/16&quot; (5.17)</td>
</tr>
<tr>
<td></td>
<td>5/16&quot;</td>
<td>9.5 (24)</td>
<td>5&quot; (127)</td>
<td>2 5/8&quot; (66.7)</td>
</tr>
</tbody>
</table>

To Install: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

**FIG. 990**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A (in. (mm))</th>
<th>D (in. (mm))</th>
</tr>
</thead>
<tbody>
<tr>
<td>990-1/2</td>
<td>5&quot; (127)</td>
<td>17/32&quot; (13.5)</td>
</tr>
<tr>
<td>990-5/8</td>
<td>5(\frac{1}{2}) &quot; (127)</td>
<td>11/16&quot; (17.5)</td>
</tr>
<tr>
<td>990-3/4</td>
<td>5(\frac{3}{4}) &quot; (127)</td>
<td>13/16&quot; (20.5)</td>
</tr>
</tbody>
</table>

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.
LONGITUDINAL CABLE BRACING FOR TRAPEZE SUPPORTED PIPE OR CONDUIT

TO INSTALL: Slip the open side of the Fig 991 yoke onto the all thread rod above the top of the trapeze. Insert the cable through opening and out the back, pull tight. Tighten break-off nuts until nut shears. Secure in place with hex nut.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rod Size</th>
<th>Cable Diameter (in. (mm))</th>
<th>A (in. (mm))</th>
<th>B (in. (mm))</th>
</tr>
</thead>
<tbody>
<tr>
<td>991</td>
<td>3/8&quot; thru 5/8&quot;</td>
<td>3/16&quot; (4.8)</td>
<td>5&quot; (127)</td>
<td>2 15/32&quot; (57.1)</td>
</tr>
</tbody>
</table>

FIG. 991

To Install: Bolt Fig 990 to structural attachment. Slide cable through Fig 990 and tighten break off nuts until shearing off. Attachment can pivot for adjustment to proper brace angle.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>A (in. (mm))</th>
<th>D (in. (mm))</th>
</tr>
</thead>
<tbody>
<tr>
<td>990-1/2</td>
<td>5&quot; (127)</td>
<td>1 11/32&quot; (13.5)</td>
</tr>
<tr>
<td>990-3/4</td>
<td>6&quot; (152)</td>
<td>1 11/16&quot; (29.9)</td>
</tr>
</tbody>
</table>

FIG. 990

MIN. 3/16" CABLE LOAD PER BRACE (lbs) SAFETY FACTOR: 3

1073

LOAD PER BRACE (lbs) SAFETY FACTOR: 3

1506

Prestretched Galvanized Aircraft Cable W/ 7 X 19 Strand Core

B-Line Solid or Punched Channel. Punched Hole Diameter 1/16" Larger than Rod Diameter.
**B-LINE 9ZN-1205, 9ZN-1208, 9ZN-1241 & B355 HOLD DOWN CLAMP**

**DATE:** September 24, 2012

**1375 SAMPSON AVENUE | CORONA, CA. 92879**

**P:** (951) 737-5599 | **F:** (951) 737-0330

**B-LINE 9ZN-1205, 9ZN-1208, 9ZN-1241 & B355 HOLD DOWN CLAMP**

**NOTES:**

1. DESIGN LOADS ARE IN LBS., SAFETY FACTOR: 3
2. LOADS ARE BASED ON CLAMPS BEING USED IN PAIRS
3. LOADS APPLICABLE ONLY WITH B-LINE STRUT
4. FOR 9ZN-1205 AND 9ZN-1208 TORQUE HARDWARE TO 10 FT. LBS.
   FOR 9ZN-1241 TORQUE HARDWARE TO 50 FT. LBS.
   FOR B355 TORQUE HARDWARE TO 30 FT. LBS.

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>CLAMP</th>
<th>GUIDE</th>
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<tbody>
<tr>
<td>9ZN-1205</td>
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<td>1239</td>
<td>702</td>
</tr>
<tr>
<td>1195</td>
<td>502</td>
<td>168</td>
</tr>
</tbody>
</table>

**LARR APPROVAL**

LARR# 25949

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