PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

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PIP PNFS0001
Pipe Supports Details

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1. Introduction

1.1 Purpose

This Practice provides fabrication/installation details for pipe supports.

1.2 Scope

This Practice describes the minimum requirements to fabricate or install supports for large and small bore piping.

The details provide dimensional and engineering requirements for the design and engineering of pipe supports.

2. References

Applicable parts of the following industry codes and standards, and references shall be considered an integral part of this Practice. The edition in effect on the date of contract award shall be used, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Industry Codes and Standards

- Manufacturers Standard Specifications
  - MSS SP-58 – Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation

2.2 Other References

- Anvil Pipe Hangers
# LARGE BORE PIPE SUPPORTS

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DIRECTIONAL STOP DS-1
(For Insulated Pipe NPS 3 to 24)

ELEVATION—TYPE 1

ELEVATION—TYPE 2 & 3

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<td>2</td>
<td>10 &amp; 12</td>
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<td>3</td>
<td>14 TO 24</td>
<td>WT6X13</td>
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PIPE SUPPORT MARK NO:

DS-1—__

Type

Dimensions are given in feet and/or inches.
### ELEVATION—TYPE 1 (4" WIDE)

### ELEVATION—TYPE 2 (6" WIDE)

### ELEVATION—TYPE 3 & 4

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<th>HORIZ. FORCE</th>
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<td>1</td>
<td>3 TO 4</td>
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<td>6 TO 8</td>
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<tr>
<td>3</td>
<td>10 &amp; 12</td>
<td>WT4X9</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>4</td>
<td>14 TO 24</td>
<td>WT6X13</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

**PIPE SUPPORT MARK NO.**

DS-2-____

**TYPE**

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE GUIDE PG-2
(FOR INSULATED PIPE NPS 3 TO 8)

PLAN

ELEVATION

1/16" CLEAR (TYP.)

L3X3X3/8

EXISTING PIPE SHOE

EXISTING BEAM

PIP

PROCESS INDUSTRY PRACTICES
FABRICATION/INSTALLATION DETAILS

ISSUED: OCT 2004
REAFFIRMED: SEPT 2013

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE/ HOLD DOWN PG–3–H
(FOR INSULATED PIPE NPS 10 TO 24)

PLAN

EXISTING PIPE SHOE

L3X3X3/8

EXISTING BEAM

1/8" CLEAR (TYP.)

ELEVATION

PIPE SUPPORT MARK NO.

PG–3–H

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
TYPE 1
(FOR NPS 3 AND 4 PIPE)

TYPE 2
(FOR NPS 6 TO 12 PIPE)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE GUIDE PG-5
(FOR BARE PIPE NPS 14 TO 24)

<table>
<thead>
<tr>
<th>NPS</th>
<th>M1</th>
<th>A</th>
<th>MAX. LOAD &quot;H&quot; (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>WT4X13</td>
<td>10&quot;</td>
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<tr>
<td>16</td>
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<td>11&quot;</td>
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</tr>
<tr>
<td>18</td>
<td>W4X13</td>
<td>12&quot;</td>
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<tr>
<td>20</td>
<td>W4X13</td>
<td>13&quot;</td>
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</tr>
<tr>
<td>24</td>
<td>W4X13</td>
<td>15&quot;</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

dimensions are given in feet and/or inches.
(FOR UNINSULATED VERTICAL PIPING NPS 3 TO 8)

**Plan**

- O.D. OF VESSEL
- 3'-0" MAX.
- STD. U-BOLT W/ DOUBLE NUTS
- PIPE & SUPPORT
- L4X4X3/8
- EXISTING VESSEL CLIP
- PSVC-1
- PSVC-2

**Elevation**

- O.D. OF VESSEL
- 1/8" MAXIMUM
- 3 SIDES
- 1/4"
- 1/2"
- PIPE
- 1/4"
- M1

**Table**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>H (MAX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L4X4X3/8</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>2</td>
<td>C6X8.2</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>3</td>
<td>C8X11.5</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

**Pipe Support Mark No.**

- PG-6---A
- PIPE SIZE
- TYPE

**Note:**
USER TO DEFINE TYPE, SIZE AND A

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIECE GUIDE PG-7
(FOR UNINSULATED VERT. PIPING NPS 10 TO 24)

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>M2</th>
<th>H (MAX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L4X4X3/8</td>
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<tr>
<td>2</td>
<td>C8X11.5</td>
<td>L4X4X3/8</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>3</td>
<td>C10X15.3</td>
<td>C6X8.2</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

NOTE:
USER TO DEFINE A,Y AND TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE GUIDE PG-8
(FOR INSULATED PIPING NPS 3 TO 6)

NOTE:
USER TO DEFINE A, Y AND TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>L4X4X3/8</td>
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<td>2</td>
<td>C6X8.2</td>
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<tr>
<td>3</td>
<td>C8X11.5</td>
<td>USED DEFINED</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.
PG-8-____-A

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE GUIDE CLIPS PGC-1

PLAN—TYPE 1

PLAN—TYPE 2

ELEV. A—A

NOTE:
USER TO DEFINE B,Y, TYPE AND Ø

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
USER TO DEFINE Y TYPE, B AND ø

"B"=4" USE WT4X7.5
"B"=6" USE WT6X9.5

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CLIP TYPE 1

ORIENTATION ANGLE $\theta$

CLIP TYPE 2

ORIENTATION ANGLE $\theta$

ELEVATION FOR CLIP TYPES "1" & "2"

CLIP TYPE 3

ORIENTATION ANGLE $\theta$

CLIP TYPE 4

ORIENTATION ANGLE $\theta$

ELEVATION FOR CLIP TYPES "3" & "4"

NOTE:
USER TO DEFINE A,B,C,W,Y,AND $\theta$, ENTER 0 IF DIMENSION NOT USED.

PIPE SUPPORT MARK NO.

PSVC-1

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
PROCESS INDUSTRY PRACTICES
FABRICATION/INSTALLATION DETAILS

VESSLE CLIPS PSVC-2

CLIP TYPE 5

1" ALL AROUND

MEMBER SIZE = "W"

CLIP TYPE 6

ELEVATION FOR
CLIP TYPES "5" & "6"

CLIP TYPE 7

ELEVATION FOR
CLIP TYPES "7" & "8"

NOTE:
1. USER TO DEFINE A,B,C,W,Y AND θ*

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
CANTILEVER SUPPORT OFF VESSEL PS-1

PLAN

EXISTING VESSEL CUP
PSVC-1
PSVC-2

3/8" STIFFENER PLATE

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>MAX.LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>USER DEFINED</td>
</tr>
<tr>
<td>2</td>
<td>C10X15.3</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

NOTE:

USER TO DEFINE A,B,C,Y AND TYPE

PIECE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
Knee Brace Support Off Vessel PS-2

Plan

Elevation

<table>
<thead>
<tr>
<th>Type</th>
<th>M1</th>
<th>M2</th>
<th>Max Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L4X4X3/8</td>
<td>L3X3X3/8</td>
<td>User Defined</td>
</tr>
</tbody>
</table>

Note:
User to define A, B, C, D, Y, etc.

Dimensions are given in feet and/or inches.
PIPE SUPPORT MARK NO.

PS-3

A B C D

TYPE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>M2</th>
<th>MAX. LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4-C8X11.5</td>
<td>2-WT4X9</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

NOTE:
USER TO DEFINE A,B,C,D,Y

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES. METRIC DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.
NOTE:
USER TO DEFINE A, C, D, Y, etc

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
KNEE BRACE SUPPORT OFF VESSEL PS-5

**PLAN**

- O.D. OF VESSEL
- PIPE INSULATION
- M1

**ELEVATION**

- EXISTING VESSEL CLIP
  - PSVC-1
  - PSVC-2
- 3/8" STIFF. PLATE
- M1
- M2

**Table**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>M2</th>
<th>MAX LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C10X15.3</td>
<td>WT4X9</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

**Note:**

USER TO DEFINE A,B,C,D,Y, etc

**Pipe Support Mark No.:**

PS-5

**Type:**

A B C D

**Dimensions:**

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CANTILEVER SUPPORT VESSEL PS–6
(ROUND TYPE CLIPS)

PLAN

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>MAX LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W6X12</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>2</td>
<td>W8X18</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

NOTE:
USER TO DEFINE A, B, C, Y AND TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SINGLE KNEE BRACE SUPPORT OFF VESSEL PS-8
(ROUND TYPE CLIPS)

PLAN

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>M2</th>
<th>MAX LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>W4X13</td>
<td>WT4X9</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>2</td>
<td>W6X15</td>
<td>WT4X9</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

NOTE:
USER TO DEFINE A,C,D,Y AND TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
### TYPE 1

**A**

1" MIN.

2'-6" (MAX.)

P

EL. Y

EXIST. COL.

1/4"

### TYPE 2

**A**

1" MIN.

2'-6" (MAX.)

P

EL. Y

EXIST. COL.

1/4"

### TYPE 3

**A**

2'-6" (MAX.)

P

EL. Y

EXIST. COL.

1/4"

### TYPE 4

**A**

2'-6" (MAX.)

P

EL. Y

EXIST. COL.

1/4"

### Table: Member Size and Max. Load

<table>
<thead>
<tr>
<th>Type</th>
<th>Member Size</th>
<th>Max. Load (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C8x11.5</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>2</td>
<td>C8x11.5</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>3</td>
<td>W6x12</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>4</td>
<td>W6x12</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

**Note:**
- USER TO DEFINE A, Y, AND TYPE

**Pipe Support Mark No.:**
- PS-16———A

**Dimensions:**
- Dimensions are given in feet and/or inches.
KNEE BRACED BRACKETS PS−17
(FROM ADJACENT STEEL)

TYPE 1A OR 1B

TYPE 2A OR 2B

<table>
<thead>
<tr>
<th>TYPE</th>
<th>M1</th>
<th>M2</th>
<th>MAX LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>W6X15</td>
<td>WT4X9</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>1B</td>
<td>W4X13</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>2A</td>
<td>W6X15</td>
<td>WT4X9</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>2B</td>
<td>W4X13</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

NOTE:
USER TO DEFINE A, C, Y AND TYPE

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
T-SUPPORT PS-19
(FROM ADJACENT STEEL)

NOTE:
1. USER TO DEFINE A,B,Y,ect,TYPE
2. P1,P2 AND P3 SHALL BE DEFINED BY USER

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SINGLE COLUMN BRACKET PS–20
(FROM EXISTING STEEL)

ELEVATION

TYPE 1

USER TO DETERMINE IF Gusseting of Exist.Steel IS REQUIRED

ELEVATION

TYPE 2

NOTE:
1. P(MAX.) @ MIDSPAN=5.0 KIPS
2. USER TO DEFINE A,B,Y AND TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.

PIPE SUPPORT MARK NO.

PS–20—
DOUBLE COLUMN BRACKET PS-21
(FROM EXISTING STEEL)

USER TO DETERMINE IF GUSSETING
OF EXISTING STEEL IS REQUIRED.

EXIST. STEEL

ELEVATION

TYPE 1

USER TO DETERMINE IF GUSSETING
OF EXISTING STEEL IS REQUIRED.

EXIST. STEEL

NOTE:
1. P(MAX.) @ MIDSPAN = 5.0 KIPS
2. USER TO DEFINE A,B,Y & TYPE.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
**ELEVATION**

### UPPER ELEMENT

- **C.S. Plate**
- **Support** & Trunnion or shoe
- **Polished S.S. Plate**

- **1/8" Lip** (TYP.)

### LOWER ELEMENT

- **Support**
- **C.S. Plate**
- **Teﬂon/Graphite**

**NOTE:**

- User to define A, B, C & D

**PIPE SUPPORT MARK NO.**

**PS-22**

**DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.**

**SLIDE PLATE SHALL BE WELDED WITH SKIP AND FILL TECHNIQUE 1/8" FILLET WELDS, 1/4" TO 1/2" LONG, ON 6" CENTERS AROUND THE PERIPHERY OF BASE METAL UNTIL PLATE IS COMPLETELY SEAL WELDED.**
NOTE:
1. USER TO DEFINE A, Y AND TYPE
2. CLAMP AND BOLT MATERIAL PER MSS SP-58 PER OPERATING TEMPERATURES.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
EXIST. TRUNNION & BASE PLATE
SEE PLATE "C" DETAIL
"A" DIA. THR'D ROD
2 HEAVY HEX NUTS TO MATCH ROD "A"
SEE PLATE "D" DETAIL
"B" DIA. PIPE SCH.80 MIN.
SEE PLATE "E" DETAIL

EXIST. CONCRETE PIER OR PAVING

T.O.GROUT

(4) 3/4" DIA. X 5 1/2" LG. CINCH ANCHOR BOLTS (BY FIELD)

ELEVATION

ROD "A"+1/8"

PLATE "C"

ROD "A"

1/2" K

PLATE "D"

1/2" K

PLATE "E"

1 1/4" (TYP)

15/16"DIA. HOLES FOR 3/4" DIA. BOLTS

PIPE SIZE
(IN)
3
4 & 6
8 TO 12
14 TO 16
TYPE
1
2
3
4

# C
6X6X1/2
6X6X1/2
6X6X1/2
8X8X1/2

# D
SEE DETAILS
SEE DETAILS
SEE DETAILS
SEE DETAILS

# E
8X8X1/2
8X8X1/2
8X8X1/2
10X10X1/2

ROD DIA.
"A" (IN)
1 1/4
1 1/2
1
2 1/2

"B" STANCHIONS
(IN)
2
3
4
6

PIPE SUPPORT MARK NO.

PS-24__ TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
## Standard U-Bolt PS-25

### Guide Type 1

![Diagram of Guide Type 1](image)

### Anchor Type 2

![Diagram of Anchor Type 2](image)

### Dimensions Table

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Rod Size A</th>
<th>Dim. in Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>1/2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>1/2</td>
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<tr>
<td>6</td>
<td>5/8</td>
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<td>20</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>24</td>
<td>1</td>
<td>24</td>
</tr>
</tbody>
</table>

**Pipe Support Mark No.**

**Pipe Size**

Dimensions are given in feet and/or inches.
T-SUPPORT PS-26
(FROM GRADE)

SECTION C-C

ELEVATION
TYPES 1 & 2
(BY FIELD)

SECTION B-B

DESIGN LOAD
VERT. LOAD: P1 = 1500 LBS.
VERT. LOAD: P2 ONLY OR P3 ONLY = 750 LBS.
VERT. LOAD: P1 + P2 + P3 COMBINED = 1500 LBS.

NOTE:
USER TO DEFINE A, B, Y AND TYPE

PIPE SUPPORT MARK NO.
PS-26

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
FOR PREVENTION OF ZINC CONTAMINATION
FROM GALV. STRUCTURAL STEEL TO STAINLESS
& NICKEL PIPING.

A = NOM. PIPE DIAMETER
(2" MIN.) (10" MAX.)

"C" THK. STAINLESS STEEL PLATE

EXISTING BEAM

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
HANGING T-SUPPORT PS-28
(FOR NPS 3 THRU 6)

NOTE:
USER TO DEFINE A, B, C, Y.

DETAIL OF
ALTERNATE CONNECTION

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
HANGING TRAPEZE FROM EXISTING CHANNEL PS–29
(FOR NPS 3 THRU 12)

ELEVATION

SECTION B–B

EXISTING CHANNEL

LOAD LIMITS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ITEM</th>
<th>LOAD LIMIT</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>II</td>
<td>L4X4X5/16</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>III</td>
<td>L6X4X3/8</td>
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</tr>
</tbody>
</table>

RANGE: 12" PIPE AND SMALLER

PIPE SUPPORT MARK NO. PS–29

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1. TYPE I DOES NOT INCLUDE THE INNER ANGLE MEMBER. TYPE II INCLUDES IT.

2. USER TO DEFINE DIMENSIONS A, B, C, D, Y, AND TYPE.

3. LOAD = USER DEFINED

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
USER TO DEFINE DIMENSIONS A, C, Y, AND TYPE.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
IF STRUCTURAL SHAPE IS NOT AVAILABLE IN SPECIFIC MATERIAL
FABRICATE SHOES FROM 1/4" PLATE. WELDS TO BE 1/4" FILLET.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>H</th>
<th>L</th>
<th>MEMBER SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>12</td>
<td>WT4X7.5</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>18</td>
<td>WT4X7.5</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>12</td>
<td>WT6X9.5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>18</td>
<td>WT6X9.5</td>
</tr>
</tbody>
</table>

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1. SPECIAL SHOE USED FOR GUIDES 
   AND DIRECTIONAL STOP ONLY.

2. IF STRUCTURAL SHAPE IS NOT AVAILABLE IN SPECIFIED MATERIAL 
   FABRICATE SHOES FROM 1/4'' PLATE. WELDS TO BE 1/4'' FILLET.

   PIPE SUPPORT MARK NO.

   S-3-
   TYPE

   DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE SHOE S-4
(FOR NPS 10 AND 12)

SHOP TO TRIM BEAM SECTIONS
SEE TABLE FOR SIZES

(TYP.) 1/4"
B.O.P.

3/8" PLATE
10"

1/2" (TYP.)
3" (TYP.)
18"

1" (TYP.)
2" (TYP.)

INSULATION BANDING SLOTS

END VIEW

SIDE VIEW

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TYPE</th>
<th>H</th>
<th>H1</th>
<th>MEMBER SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>4</td>
<td>5 3/8</td>
<td>WBX24</td>
</tr>
<tr>
<td></td>
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<td>6</td>
<td>7 3/8</td>
<td>WBX31</td>
</tr>
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<td>12</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>WBX24</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>WBX31</td>
</tr>
</tbody>
</table>

NOTE:
IF STRUCTURAL SHAPE IS NOT AVAILABLE IN SPECIFIED MATERIAL
FABRICATE SHOES FROM 3/8" PLATE. WELDS TO BE 1/4" FILLET.

PIPE SUPPORT MARK NO.

S-4__ TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE SHOE S-5
(FOR NPS 14 TO 24 WITH LESS THAN 4" INSUL.)

END VIEW

SIDE VIEW

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TYPE</th>
<th>H</th>
<th>H1</th>
<th>W</th>
<th>MEMBER SIZE</th>
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<tbody>
<tr>
<td>14</td>
<td>1</td>
<td>4</td>
<td>4 13/16</td>
<td>10</td>
<td>W8X24</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>4</td>
<td>4 5/8</td>
<td>10</td>
<td>W8X24</td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>4</td>
<td>5 1/16</td>
<td>12</td>
<td>W10X22</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>4</td>
<td>4 7/8</td>
<td>12</td>
<td>W10X22</td>
</tr>
<tr>
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<td>5</td>
<td>4</td>
<td>4 5/8</td>
<td>12</td>
<td>W10X22</td>
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PIPE SUPPORT MARK NO.

S-5-__

 DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE SHOE S-6
(FOR NPS 14 TO 24 WITH INSUL. >=4" AND < 6")

END VIEW

SHOP TO TRIM BEAM SECTIONS
SEE TABLE FOR SIZES

SIDE VIEW

1/2" (TYP.)

3/8"

1/2" (TYP.)

18"

1/2" (TYP.)

3"

1"

2" (TYP.)

INSULATION BANDING SLOTS

1/2" (TYP.)

1/2" (TYP.)

B.O.P.

1/4"

1/2" PLATE

H

H1

W


<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TYPE</th>
<th>H</th>
<th>H1</th>
<th>W</th>
<th>MEMBER SIZE</th>
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<tr>
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<td>6</td>
<td>6 3/4</td>
<td>10</td>
<td>W8X31</td>
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<td>2</td>
<td>6</td>
<td>6 9/16</td>
<td>10</td>
<td>W8X31</td>
</tr>
<tr>
<td>18</td>
<td>3</td>
<td>6</td>
<td>6 15/16</td>
<td>12</td>
<td>W10X33</td>
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<tr>
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<td>4</td>
<td>6</td>
<td>6 3/4</td>
<td>12</td>
<td>W10X33</td>
</tr>
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<td>5</td>
<td>6</td>
<td>6 1/8</td>
<td>12</td>
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PIPE SUPPORT MARK NO.

S-6-

TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE SHOE – (CLAMP TYPE) S–7
(FOR PIPE NPS 3 TO 8)

END VIEW

SIDE VIEW

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TYPE</th>
<th>H</th>
<th>L</th>
<th>MEMBER SIZE</th>
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</thead>
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<td>WT4X7.5</td>
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<td>4</td>
<td>18</td>
<td>WT4X7.5</td>
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<tr>
<td></td>
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<td>6</td>
<td>12</td>
<td>WT6X9.5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6</td>
<td>18</td>
<td>WT6X9.5</td>
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</tbody>
</table>

NOTE:
IF STRUCTURAL SHAPE IS NOT AVAILABLE IN SPECIFIED MATERIAL,
FABRICATE SHOES FROM 3/8" PLATE. WELDS TO BE 1/4" FILLET.
PIPE SHOE – (CLAMP TYPE) S–8
(FOR PIPE NPS 10 AND 12)

END VIEW

SIDE VIEW

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TYPE</th>
<th>H</th>
<th>H1</th>
<th>MEMBER SIZE</th>
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</thead>
<tbody>
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<td>4 7/8</td>
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<td></td>
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<td>6</td>
<td>6 7/8</td>
<td>W8X31</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>4</td>
<td>4 1/2</td>
<td>W8X24</td>
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<td></td>
<td>4</td>
<td>6</td>
<td>6 1/2</td>
<td>W8X31</td>
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</table>

**NOTE:**

IF STRUCTURAL SHAPE IS NOT AVAILABLE IN SPECIFIED MATERIAL.
FABRICATE SHOES FROM 3/8" PLATE. WELDS TO BE 1/4" FILLET.

**PIPE SUPPORT MARK NO.**

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE SHOE – (CLAMP TYPE) S–9
(FOR PIPE NPS 14 TO 24)

END VIEW

SIDE VIEW

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TYPE</th>
<th>H</th>
<th>H1</th>
<th>W</th>
<th>MEMBER SIZE</th>
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</thead>
<tbody>
<tr>
<td>14</td>
<td>1</td>
<td>4</td>
<td>4 5/16</td>
<td>10</td>
<td>W8X24</td>
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<tr>
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<tr>
<td>18</td>
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<td>4</td>
<td>4 7/16</td>
<td>12</td>
<td>W10X22</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>4</td>
<td>4 1/4</td>
<td>12</td>
<td>W10X22</td>
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<td>24</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>12</td>
<td>W10X22</td>
</tr>
</tbody>
</table>

NOTE:
IF STRUCTURAL SHAPE IS NOT AVAILABLE IN SPECIFIED MATERIAL.
FABRICATE SHOES FROM 3/8" PLATE. WELDS TO BE 1/4" FILLET.

PIPE SUPPORT MARK NO.
S–9————

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SPRING HANGER ASSEMBLY TYPE C, SH-4
(WITH WELDING LUG TYPE)

B.O.S. EL.__________

EXIST. STEEL

WELDING LUG
ANVIL FIG. 55 OR EQUAL
ANVIL SPRING
OR EQUAL
 SIZE-__________
TYPE- C
FIG. NO.-__________
OPERATING LOAD-__________
COLD LOAD-__________
MOVEMENT-__________
HYDRO. TEST LOAD-__________

CLEVIS
FIG. 299
OR EQUAL

MACHINE THREADED ROD
ANVIL FIG. 140 OR EQUAL
LOCK NUT

EL.______

PIN HOLE

VIEW B-B

VIEW A-A

ALTERNATE PIPE
ATTACHMENT

ASSEMBLY TAG NO.__________
LOCATION DWG./ISO NO.__________
LINE NO._______________________

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE EL. ________

EXIST. TRUNNION OR SHOE

SLIDING SURFACE

P.O.S. EL. ________

T.O.GROUT EL. ________

INSTALLED
HEIGHT

ANVIL SPRING
OR EQUAL
SIZE-__________
FIG. NO.-__________
TYPE- F
OPERATING LOAD-__________
COLD LOAD-__________
MOVEMENT-__________
HYDRO. TEST LOAD-__________

(4) 3/4" DIA. X 5 1/2" LG.
CINCH ANCHOR BOLTS
FOR SPRING SIZE UPTO
SIZE 2, THE BOLT SIZE SHALL
BE 5/8" DIA.
(BY FIELD)

ASSEMBLY TAG NO. __________
LOCATION DWG./ISO NO. __________
LINE NO. __________

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SPRING SUPPORT ASSEMBLY TYPE F, SH-6
(BASE TYPE AT GRADE WITH SLIDE PLATE)

PIPE EL. ________

Φ ________

EXIST. TRUNNION OR SHOE
7/16" (FOR SLIDE PLATE SEE PNFS0371)

P.O.S. EL. ________

INSTALLED HEIGHT

T.O. GROUT EL. ________

EXIST. CONCRETE PIER
OR PAVING

ANVIL SPRING
OR EQUAL
SIZE—__________

FIG. NO.—__________

TYPE— F

OPERATING LOAD—__________

COLD LOAD—__________

MOVEMENT—__________

HYDRO. TEST LOAD—__________

(4) 3/4" DIA. X 5 1/2" LG.
CINCH ANCHOR BOLTS
FOR SPRING SIZE UPTO
SIZE 2. THE BOLT SIZE SHALL
BE 5/8" DIA.
(BY FIELD)

ASSEMBLY TAG NO. __________
LOCATION DWG./ISO NO. __________
LINE NO. __________

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
B.O.S. EL._____________  
WELDING LUG  
ANVL FIG. 55 OR EQUAL  

EXIST. STEEL  

ANVL CONSTANT SPRING OR EQUAL  
SIZE—__________  
FIG. NO.—C-80—V MODEL R  
TYPE—C  
CONSTANT LOAD—__________  
TOTAL TRAVEL—__________  
ACTUAL TRAVEL—__________  
ROD DIA. "U"—__________  
HYDRO. TEST LOAD—__________  

MACHINE THREADED ROD  
ANVL FIG. 140 OR EQUAL  

WELDLESS EYE NUT  
ANVL FIG. 290 OR EQUAL  
LOCK NUT  

PIPE EL._____________  

__________PIPE CLAMP  
ANVL FIG.__________ OR EQUAL  

ASSEMBLY TAG NO._______________  
LOCATION DWG/ISO NO._____________  
LINE NO._______________  

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE EL.  ____________

EXIST. TRUNNION OR SHOE

7/16" (FOR SLIDE PLATE SEE PNFS0371)

P.O.S. EL.  ____________

ANVIL CONSTANT SPRING
OR EQUAL

SIZE—__________

FIG. NO. 81-H (UPTHRUST)
TYPE—F

CONSTANT LOAD—__________

TOTAL TRAVEL—__________

ACTUAL TRAVEL—__________

HYDRO TEST LOAD—__________

T.O.S. EL.  ____________

EXIST. BEAM

1/4"  1-2

ASSEMBLY TAG NO. ____________
LOCATION DWG./ISO NO. ____________
LINE NO. ____________

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SPRING HANGER ASSEMBLY TYPE A, SH-15
(WITH WELDING LUGS FROM STEEL)

B.O.S. EL. __________

EXIST. STEEL

WELDED BEAM ATTACHMENT
ANVIL FIG. 66 OR EQUAL

WELDED EYE ROD
ANVIL FIG. 278 OR EQUAL

EL. __________

ANVIL SPRING
OR EQUAL

SIZE-___________

TYPE- A

FIG. NO.-__________

OPERATING LOAD-________

COLD LOAD-__________

MOVEMENT-___________

HYDRO. TEST LOAD-__________

CLEVIS
ANVIL FIG. 299
OR EQUAL

MACHINE THREADED ROD
ANVIL FIG. 140 OR EQUAL

LOCK NUT

PIN HOLE

VIEW B-B

VIEW A-A

ASSEMBLY TAG NO. __________
LOCATION DWG./ISO NO. __________
LINE NO. __________

ALTERNATE PIPE
ATTACHMENT

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 PAGE 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1. FOR BASE PLATE DIMENSIONS & DRILLING, SEE TR-4A (PNFS0502)
2. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
3. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR BASE PLATE DIMENSIONS
   & DRILLING, SEE TR−2 (ON PAGE 13 OF 14)
2. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
3. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
DEGREES AS SHOWN ON ISO.

PLAN

FOR BASE PLATE DIMENSIONS & DRILLING, SEE TR-2 ON PAGE 13 OF 14

ELEV.

NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
TRUNNION SUPPORT, TR-H
(BOLTED SUPPORT ON VERTICAL ELL)

FOR BASE PLATE DIMENSIONS & DRILLING, SEE TR-2 ON PAGE 13 OF 14

ELEV. SAME AS PIPE UNLESS OTHERWISE NOTED ON ISO.

1/4" WEEP HOLE TOP OF STEEL OR CONC.

NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 PAGE 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1. STIFFENING BARS 1 1/2"X1/2" SHALL BE ALUMINUM FOR ALUMINUM TRUNNIONS, AND CARBON STEEL FOR CARBON STEEL TRUNNIONS AND ALL OTHER MATERIALS. SUFFICIENT SHIMS OR WEDGES ARE TO BE PROVIDED BY THE FIELD TO UNIFORMLY DISTRIBUTE THE TRUNNION LOAD ON THE SUPPORT UNLESS OTHERWISE NOTED.

2. FOR TRUNNION DETAILS SEE PAGE 11 OF 14

3. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
<table>
<thead>
<tr>
<th>TRUNNION SIZE</th>
<th>BASE PL. SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2&quot;, 2&quot;, 3&quot;</td>
<td>8 X 8 X 3/8</td>
</tr>
<tr>
<td>4&quot;</td>
<td>8 X 8 X 1/2</td>
</tr>
<tr>
<td>6&quot;</td>
<td>10 X 10 X 3/4</td>
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<tr>
<td>8&quot;</td>
<td>12 X 12 X 3/4</td>
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<td>20&quot;</td>
<td>21 X 21 X 1</td>
</tr>
<tr>
<td>24&quot;</td>
<td>25 X 25 X 1</td>
</tr>
</tbody>
</table>

SEE ISO FOR TRUNNION SIZE

* ALL LARGER TRUNNIONS—BASE PLATE SIZE = O.D. + 1" X 1 1/4" THICK

NOTE:
1. DO NOT DRILL BASE PLATE Holes unless called for on ISO.
2. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
3. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CALL OUT

K - 10 - (80) - 24 - X

TYPE (FROM PNFS0500)
TRUNNION PIPE SIZE
TRUNNION PIPE SCHEDULE
LENGTH (L)
X = NO LENGTH REQUIRED
X = NO PAD
W = PAD WIDTH FROM PNFS0500

NOTE:
1. FOR TRUNNION DETAILS SEE PAGE 11 OF 14
2. TRUNNION CALL OUT AS PER PNFS0500 14 OF 14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
WELDING LUG. ATF-11
(FOR PIPING NPS 3 AND LARGER)

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ROD SIZE</th>
<th>PIN OR BOLT</th>
<th>R</th>
<th>B MIN.</th>
<th>D MIN.</th>
<th>T</th>
<th>H</th>
<th>MAX. LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATF-11A</td>
<td>5/8&quot;</td>
<td>3/4&quot;</td>
<td>1 1/4&quot;</td>
<td>2 1/2&quot;</td>
<td>3&quot;</td>
<td>1/4&quot;</td>
<td>1 3/16&quot;</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>ATF-11B</td>
<td>3/4&quot;</td>
<td>7/8&quot;</td>
<td>1 1/4&quot;</td>
<td>2 1/2&quot;</td>
<td>3&quot;</td>
<td>3/8&quot;</td>
<td>1 5/16&quot;</td>
<td>USER DEFINED</td>
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<td>ATF-11C</td>
<td>7/8&quot;</td>
<td>1&quot;</td>
<td>1 1/4&quot;</td>
<td>2 1/2&quot;</td>
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<tr>
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<td>1&quot;</td>
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<td>1/2&quot;</td>
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<td>1 3/8&quot;</td>
<td>2&quot;</td>
<td>4&quot;</td>
<td>4&quot;</td>
<td>5/8&quot;</td>
<td>1 1/2&quot;</td>
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<td>1 7/8&quot;</td>
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<td>6&quot;</td>
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<td>3/4&quot;</td>
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</tbody>
</table>

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
**WELDING CLIP, ATF-12**

*(FOR WELDING NPS 3 AND LARGER)*

---

**ELEVATION**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ROD SIZE</th>
<th>A</th>
<th>B</th>
<th>S</th>
<th>T</th>
<th>Z</th>
<th>MAXIMUM RECOMMENDED LOAD - LBS.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2&quot;</td>
<td>7/8&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>7/16&quot; USER DEFINED</td>
</tr>
<tr>
<td>ATF-12B</td>
<td>1/2&quot;</td>
<td>2&quot;</td>
<td>7/8&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>9/16&quot; USER DEFINED</td>
</tr>
</tbody>
</table>

*DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.*
WELDING CLIP, ATF-13
(FOR PIPING NPS 3 AND LARGER)

EXISTING STRUCTURE

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ROD SIZE</th>
<th>BOLT SIZE</th>
<th>R</th>
<th>B</th>
<th>D MIN.</th>
<th>S</th>
<th>T</th>
<th>H</th>
<th>MAXIMUM RECOMMENDED LOAD - LBS.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1/2 X 2 1/2</td>
<td>7/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>9/16&quot;</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>ATF-13B</td>
<td>1/2&quot;</td>
<td>5/8 X 2 1/2</td>
<td>7/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>11/16&quot;</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
## WELDING LUG, WL-1

### Dimensions

<table>
<thead>
<tr>
<th>ROD SIZE</th>
<th>&quot;C&quot;</th>
<th>&quot;D&quot;</th>
<th>&quot;E&quot;</th>
<th>&quot;EE&quot;</th>
<th>&quot;G&quot;</th>
<th>&quot;H&quot;</th>
<th>FILLET WELD SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 &amp; 1/2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1/2</td>
<td>3/8</td>
<td>11/16 3/16&quot;</td>
</tr>
<tr>
<td>5/8</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1/2</td>
<td>3/8</td>
<td>13/16 3/16&quot;</td>
</tr>
<tr>
<td>3/4</td>
<td>4</td>
<td>1 1/4</td>
<td>2 1/4</td>
<td>5</td>
<td>1/2</td>
<td>15/16</td>
<td>3/16&quot;</td>
</tr>
<tr>
<td>7/8</td>
<td>4</td>
<td>1 1/4</td>
<td>2 1/4</td>
<td>5</td>
<td>1/2</td>
<td>1 1/8</td>
<td>3/16&quot;</td>
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<tr>
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<td>4</td>
<td>1 1/2</td>
<td>2 1/2</td>
<td>6</td>
<td>5/8</td>
<td>1 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td>1 1/8</td>
<td>4</td>
<td>1 1/2</td>
<td>2 1/2</td>
<td>6</td>
<td>5/8</td>
<td>1 3/8</td>
<td>1 1/4</td>
</tr>
<tr>
<td>1 1/4</td>
<td>4</td>
<td>2</td>
<td>2 3/4</td>
<td>6 1/2</td>
<td>3/4</td>
<td>1 1/2</td>
<td>1/4&quot;</td>
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<tr>
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<td>5</td>
<td>2</td>
<td>3 1/4</td>
<td>7 1/2</td>
<td>1</td>
<td>1 3/4</td>
<td>1/4&quot;</td>
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<tr>
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<td>5</td>
<td>2 1/2</td>
<td>3 1/4</td>
<td>7 1/2</td>
<td>1</td>
<td>2</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>3</td>
<td>3 3/4</td>
<td>9</td>
<td>1 1/8</td>
<td>2 3/8</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>2 1/4</td>
<td>8</td>
<td>3 1/4</td>
<td>4 1/4</td>
<td>10</td>
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<td>2 5/8</td>
<td>3/8&quot;</td>
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<tr>
<td>2 1/2</td>
<td>8</td>
<td>3 1/4</td>
<td>4 1/2</td>
<td>10</td>
<td>1 1/2</td>
<td>2 7/8</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>2 3/4</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>11 1/2</td>
<td>1 1/2</td>
<td>3 1/8</td>
<td>3/8&quot;</td>
</tr>
</tbody>
</table>

**PIE SUPPORT MARK NO.** WL-1-

**Dimensions are given in feet and/or inches.**
WELDING LUG (ON ELBOW) WL-2
(FOR NPS 2-1/2 TO 30)

**TABLE 1**

<table>
<thead>
<tr>
<th>Rod Size</th>
<th>1/2</th>
<th>5/8</th>
<th>3/4</th>
<th>7/8</th>
<th>1</th>
<th>1-1/8</th>
<th>1-1/4</th>
<th>1-1/2</th>
<th>1 3/4</th>
<th>2</th>
<th>2 1/4</th>
<th>2-1/2</th>
<th>2-3/4</th>
<th>3</th>
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<tbody>
<tr>
<td>T</td>
<td>1/4</td>
<td>3/8</td>
<td>3/8</td>
<td>1/2</td>
<td>1/2</td>
<td>5/8</td>
<td>5/8</td>
<td>3/4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1-1/4</td>
</tr>
<tr>
<td>D</td>
<td>3-1/2</td>
<td>3-1/2</td>
<td>3-1/2</td>
<td>3-1/2</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>8-1/2</td>
<td>8-1/2</td>
<td>9-3/4</td>
<td>9-3/4</td>
<td>9-3/4</td>
</tr>
<tr>
<td>R</td>
<td>1-1/2</td>
<td>1-1/2</td>
<td>1-1/2</td>
<td>1-1/2</td>
<td>2</td>
<td>2</td>
<td>2-1/2</td>
<td>3</td>
<td>3</td>
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<td>3-1/2</td>
<td>3-3/4</td>
<td>3-3/4</td>
<td>3-3/4</td>
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</tbody>
</table>

**TABLE 2**

<table>
<thead>
<tr>
<th>Rod Size</th>
<th>No. of Notches</th>
<th>Weld Size</th>
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<tbody>
<tr>
<td>1/2&quot; - 7/8&quot;</td>
<td>1</td>
<td>3/16&quot;</td>
</tr>
<tr>
<td>1&quot; - 1 1/2&quot;</td>
<td>2</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>1 3/4&quot; - 3&quot;</td>
<td>3</td>
<td>3/8&quot;</td>
</tr>
</tbody>
</table>

**ELBOW SIZE (NPS)**

2-1/2: 7-5/16
3: 7-7/16
3-1/2: 7-1/2
4: 7-1/2
5: 7-1/2
6: 7-9/16
8: 7-7/16
10: 7-5/16
12: 7-1/8
14: 6-3/8
16: 6-1/8
18: 5-13/16
20: 6-3/4
22: 7-1/2
24: 7-1/4
26: 7
28: 7
30: 7

**MAX. LOAD IN KIPS (650°F MAX.):**

1.13

**Dimensions are given in feet and/or inches.**
NOTES:

1.) FOR MAX. LOAD SEE TABLE ON PAGE 2.

2.) MAX. LOADS ARE FOR BRACKETS ONLY. CHECK VESSEL FOR LOCAL STRESSES (CHECK IF PAD IS REQUIRED).

3.) MAX. LOADS ARE FOR SUPPORT MEMBERS ONLY. CHECK EXISTING STEEL FOR ADDITIONAL PIPING LOADS.

4.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS:

   EL. Y

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
### PROCESS INDUSTRY PRACTICES
#### FABRICATION/INSTALLATION DETAILS

**CANTILEVER BRACKET FROM ADJ. STEEL OR VESSEL, FPS-1**
*(FOR PIPING UP TO NPS 2 1/2)*

---

**ELEVATION**

**FPS-1G**

**FPS-1H**

**ELEVATION**

**FPS-1K**

---

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ANGLE SIZE</th>
<th>MAX. VERTICAL LOAD (USER DEFINED)</th>
<th>MAX. HORIZONTAL LOAD (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 1/2 X 2 1/2 X 5/16</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>B</td>
<td>2 1/2 X 2 1/2 X 5/16</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>C</td>
<td>2 1/2 X 2 1/2 X 5/16</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>D</td>
<td>2 1/2 X 2 1/2 X 5/16</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>E</td>
<td>3 X 3 X 3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>F</td>
<td>3 X 3 X 3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>G</td>
<td>2 1/2 X 2 1/2 X 5/16</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>H</td>
<td>3 X 3 X 3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>K</td>
<td>2 1/2 X 2 1/2 X 5/16</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

---

**PIPE SUPPORT MARK NO.**

FPS-1--A

**DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.**
NOTES:

1.) FOR MAX. LOAD SEE TABLE ON PAGE 2.
2.) MAX. LOADS ARE FOR BRACKETS ONLY. CHECK VESSEL FOR LOCAL STRESES (CHECK IF PAD IS REQUIRED).
3.) MAX. LOADS ARE FOR SUPPORT MEMBERS ONLY. CHECK EXISTING STEEL FOR ADDITIONAL PIPING LOADS.
4.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS: EL. Y

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
BRACED CANT. BRACKET FM. ADJ. STL. OR VESSEL, FPS-2
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
FPS-2C

ELEVATION
FPS-2D
(FOR INSULATED VESSELS ONLY)

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>MAX VERT. LOAD (USER DEFINED)</th>
<th>MAX HORIZ. LOAD (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>B</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>C</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>D</td>
<td>L3X3X3/8</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

FPS-2C

NOTE:
USER TO DEFINE TYPE AND A

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) MAX. LOADS ARE FOR SUPPORT MEMBERS ONLY. CHECK EXISTING STEEL FOR ADDITIONAL PIPING LOADS.

2.) USER TO DETERMINE IF GUSSETTING OF EXISTING STEEL IS REQUIRED.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   EL. Y

4.) USER TO DEFINE A AND B

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) MAX. LOADS ARE FOR SUPPORT MEMBERS ONLY. CHECK EXISTING STEEL FOR ADDITIONAL PIPING LOADS.

2.) USER TO DETERMINE IF GUSSETTING OF EXISTING STEEL IS REQUIRED.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING.

EL. Y

4.) USER TO DEFINE A AND B

PIPE SUPPORT MARK NO.

FPS-4-__

A

B

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) MAX. LOADS ARE FOR SUPPORT MEMBERS ONLY. CHECK EXISTING STEEL FOR ADDITIONAL PIPING LOADS.

2.) USER TO DETERMINE IF GUSSETTING OF EXISTING STEEL IS REQUIRED.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:

   EL. Y

4.) USER TO DEFINE TYPE, A AND B

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) MAX. LOADS ARE FOR SUPPORT MEMBERS ONLY. CHECK EXISTING STEEL FOR ADDITIONAL PIPING LOADS.

2.) USER TO DETERMINE IF GUSSETTING OF EXISTING STEEL IS REQUIRED.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   EL. Y

4.) USER TO DEFINE A, B AND TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
T-SUPPORT FROM ADJACENT STEEL, FPS-7A
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
FPS-7A

NOTES:
1.) P1, P2 AND P3 LOADS TO BE DEFINED BY THE USER.
2.) DIMENSIONS A, B AND Y TO BE DEFINED BY USER.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   EL. Y
   PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
T-SUPPORT FROM ADJACENT STEEL, FPS-7B
(FOR PIPING UP TO NPS 2 1/2)

NOTES:
1.) P1 AND P2 LOADS TO BE DEFINED BY THE USER.
2.) DIMENSIONS A, B AND Y TO BE DEFINED BY USER.
3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING: EL. Y

DETAIL OF ALTERNATE CONNECTION

PIPE SUPPORT MARK NO.

FPS-7B

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1.) THE FOLLOWING DIMENSIONS
    AND/OR INFORMATION ARE
    SHOWN ON PIPING DRAWING:
    EL. Y

2.) USER TO DEFINE A

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
IF LOCATION OF TIE BEAMS EXCEED 1'-0", SUPPORTING BEAM TO BE CHECKED FOR TORSIONAL MOMENTS.

NOTES:
1. USE EITHER DIM. A OR DIM. C, BUT NOT SIMULTANEOUSLY.
2. DIMENSIONS A OR C, B, AND Y TO BE DEFINED BY USER.

PIPE SUPPORT MARK NO.

SECTION A-A

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SUPPORT FOR VERTICAL PIPING, FPS–12
(For piping up to NPS 2 1/2)

Plan

(2) 1/2" dia. bolts (locate at midspan)
with washer and hex nut. (Hand
tighten and tack weld nut to bolt).

Elevation

(2) 9/16" dia.
holes in 'A'
(2) 9/16" x 2"
slotted holes
in 'B'

Existing structure or vessel

P

1/4"

1'–2" max.

6/16"

5/16"

3/16"

2"

2'

1/4"

NOTES:

1.) Max. loads are for attachment
only. Check pipe for
local stresses.

2.) The following dimensions
and/or information are
shown on piping drawing:

デザインロード:

Max. load P (user defined) = user defined

Pipe Support Mark No.

FPS–12–A

Dimensions are given in feet and/or inches.
CANTILEVER SUPPORT ADJACENT TO STEEL, FPS-13
(FOR PIPING UP TO NPS 2 1/2)

EXISTING CHANNEL OR W BEAM
L3X3X3/8
1"
2' 0" MAXIMUM
2' 6" MINIMUM

PLAN

EXISTING ATTACHMENT

ELEVATION

FPS-13

DESIGN LOAD:

VERTICAL LOAD: P (USER DEFINED) = USER DEFINED

NOTE:

1.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING: EL. Y

ALTERNATE BEAM CONNECTION

PIPE SUPPORT MARK NO.

FPS-13

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CANTILEVER BRACKET FOR PIPE SUPPORTS, FPS–15
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
FPS–15A

DESIGN LOAD:
ALLOWABLE LOAD P (USER DEFINED) = USER DEFINED

NOTES:
1.) EXISTING SUPPORTING MEMBERS TO BE CHECKED FOR ADDITIONAL PIPING LOAD.
2.) IF OBSTRUCTION BETWEEN EXISTING MEMBERS DOES NOT ALLOW THE USE OF THIS STANDARD CONNECTION, USE ALTERNATE CONNECTIONS AS SHOWN ON SHEET 2.
3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
EL. Y
4.) USER TO DEFINE TYPE, A AND C

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ALTERNATE CONNECTIONS
SEE NOTES AND DIMENSIONS ON SHEET 1

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CANTILEVER BRACKET FOR PIPE SUPPORTS, FPS-16
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
FPS-16A

DESIGN LOAD:
ALLOWABLE LOAD P (USER DEFINED) = USER DEFINED

NOTES:

1.) EXISTING SUPPORTING MEMBERS TO BE CHECKED FOR ADDITIONAL PIPING LOAD.

2.) IF OBSTRUCTION BETWEEN EXISTING MEMBERS DOES NOT ALLOW THE USE OF THIS STANDARD CONNECTION, USE ALTERNATE CONNECTIONS AS SHOWN ON SHEET 2.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   EL. Y

4.) USER TO DEFINE TYPE, A AND C

PIPE SUPPORT MARK NO.

W4X13

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ALTERNATE CONNECTIONS

SEE NOTES AND DIMENSIONS ON SHEET 1

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SUPPLEMENTARY STEEL DETAIL, FPS–20
(FOR PIPING UP TO NPS 2 1/2)

FPS–20A & 20B
(FOR MEMBER SIZES SEE TABLE)

FPS–20C & 20D
(FOR MEMBER SIZES SEE TABLE)

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MEMBER SIZE</th>
<th>B</th>
<th>MAX. LOAD LBS. (USER DEFINED)</th>
<th>MAX. SPAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>L3X3X3/8</td>
<td>2 1/2&quot;</td>
<td>USER DEFINED</td>
<td>6’–0&quot;</td>
</tr>
<tr>
<td>B</td>
<td>L4X4X3/8</td>
<td>2 1/2&quot;</td>
<td>USER DEFINED</td>
<td>8’–0&quot;</td>
</tr>
<tr>
<td>C</td>
<td>C4X5.4</td>
<td>2 1/8&quot;</td>
<td>USER DEFINED</td>
<td>8’–0&quot;</td>
</tr>
<tr>
<td>D</td>
<td>C6X8.2</td>
<td>2 1/8&quot;</td>
<td>USER DEFINED</td>
<td>8’–0&quot;</td>
</tr>
</tbody>
</table>

NOTES:

1.) EXISTING SUPPORTING MEMBERS TO BE CHECKED FOR ADDITIONAL PIPING LOAD.
2.) USE IF OBSTRUCTION BETWEEN EXISTING BEAMS DOES NOT ALLOW THE USE OF STANDARD CONNECTIONS.
3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   EL. Y
4.) USER TO DEFINE TYPE, A AND B
   DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.

PIPE SUPPORT MARK NO.
NOTES:

1.) EXISTING SUPPORTING MEMBERS TO BE CHECKED FOR ADDITIONAL PIPING LOAD.

2.) USE IF OBSTRUCTION BETWEEN EXISTING BEAMS DOES NOT ALLOW THE USE OF STANDARD CONNECTIONS.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   EL. Y

4.) USER TO DEFINE TYPE, A AND C

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) SPECIFY LENGTH OF BOLT ON ISO, IF OTHER THAN 5 1/2".

2.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING.
   EL. Y

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
'T' POST, FPS-28
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION

ALTERNATE CONNECTIONS ADJACENT TO COLUMN

4 - 9/16" DIA. HOLES IN PLATE &
1/2" X 5 1/2" LG. (OR C#) CINCH
BOLTS
(BY FIELD)

SECTION A-A

PIPE SUPPORT MARK NO.

FPS-28

A - B - C (FOR CINCH BOLT DIA. ONLY)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.

NOTES:
1. THE FOLLOWING DIMENSIONS AND/OR
   INFORMATION ARE SHOWN ON PIPING
   DRAWING:
   EL. Y

2. USER TO DEFINE A, B AND C
NOTES:

1.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING: EL. Y

2.) DO NOT USE FOR GUIDE OR ANCHORS.

3.) USER TO DEFINE A AND B

SECTION A-A

PIPE SUPPORT MARK NO.

FPS-29

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SUPPORT FROM GRADE OR STEEL, FPS–30
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
FPS–30A

SECTION 'A–A'

ELEVATION
FPS–30B

SECTION 'B–B'

ELEVATION
FPS–30C

SECTION 'C–C'

PIPE SUPPORT MARK NO.

FPS–30

A NPS TYPE (LAST LETTER ONLY)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ELEVATION
FPS-30D

<table>
<thead>
<tr>
<th>PS NUMBER</th>
<th>PIPE SIZE LIMITATION</th>
<th>MAX LOAD (LBS.) (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPS-30A/B/C/D</td>
<td>UP TO 2 1/2&quot; DIA.</td>
<td>USER DEFINED USER DEFINED</td>
</tr>
</tbody>
</table>

BASE PLATE DETAIL

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ADJUSTABLE SUPPORT FROM GRADE OR STEEL, FPS–40
(FOR PIPING UP TO NPS 2 1/2)

**Bill of Material**

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS REQUIRED</td>
<td>2&quot; DIA. SCH. 40 PIPE</td>
</tr>
<tr>
<td>AS REQUIRED</td>
<td>1&quot; DIA. ROD</td>
</tr>
<tr>
<td>2</td>
<td>HEX NUTS FOR ROD</td>
</tr>
<tr>
<td>AS REQUIRED</td>
<td>Ø 1/4&quot; THICK</td>
</tr>
<tr>
<td>AS REQUIRED</td>
<td>Ø 3/8&quot; THICK</td>
</tr>
</tbody>
</table>

MAX. LOAD (USER DEFINED) = USER DEFINED

**Pipe Support Mark No.**

FPS–40

A B L" OR "T" (ONLY FOR ALTERNATE)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ADJUSTABLE SUPPORT FROM GRADE OR STEEL, FPS-41
(FOR PIPING UP TO NPS 2 1/2)

EXISTING FITTING OR ELBOW

2" X 5" X 1/4" (FIELD CUT TO FIT)
2" X 2" X 3/8"

3/8" THK. W/ 1 1/32" DIA. HOLE
1/16" CLEAR

2" DIA. SCH. 40 PIPE
4" X 4" X 3/8"

TOP OF PAVING

TOP OF GROUT OR STEEL

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>AS REQUIRED</td>
<td>STD. WT. PIPE 2&quot; DIA.</td>
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<tr>
<td>AS REQUIRED</td>
<td>1&quot; DIA. ROD</td>
</tr>
<tr>
<td>AS REQUIRED</td>
<td>ø 3/8&quot; THICK</td>
</tr>
<tr>
<td>2</td>
<td>HEX NUTS FOR ROD</td>
</tr>
<tr>
<td>AS REQUIRED</td>
<td>ø 1/4&quot; THICK</td>
</tr>
</tbody>
</table>

MAX. LOAD (USER DEFINED) = USER DEFINED

PIPE SUPPORT MARK NO.

FPS-41

A - B "S" (FOR ALT. CONN. TO STRAIGHT PIPE)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CANTILEVER BRACKET FROM ADJACENT PIPING, FPS-50
(FOR PIPING UP TO NPS 2 1/2)

NOTES:

1. SUPPORT UP TO 2'-0" MAX.; PIPE TO BE SUPPORTED SHOULD NOT EXCEED ONE-FOURTH THE DIAMETER OF THE SUPPORTING PIPE.
2. ELEVATION Y TO BE SHOWN ON PIPING DRAWING.

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) SUPPORT UP TO 2 FT. MAX.; PIPE TO BE SUPPORTED SHOULD NOT EXCEED ONE-FOURTH THE DIAMETER OF THE SUPPORTING PIPE.

2.) THE FOLLOWING DIMENSION AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS: EL. Y.

PIPE SUPPORT MARK NO.

FPS-51-

A

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
CANTILEVER BRACKET FROM ADJACENT PIPING, FPS-52
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
(SUPPORTING PIPE FROM 6" TO 12" DIA.)

NOTES:

1.) SUPPORT UP TO 2 FT. MAX.; PIPE TO BE SUPPORTED
SHOULD NOT EXCEED ONE-FOURTH THE DIAMETER
OF THE SUPPORTING PIPE.

2.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION
ARE SHOWN ON PIPING DRAWINGS:
   EL. Y.

PIPE SUPPORT MARK NO.
FPS-52-

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1.) GUSSET CONNECTIONS FOR UNINSULATED VESSELS MAY BE OMITTED.

2.) MAX. LOADS ARE FOR BRACKETS ONLY. CHECK VESSELS FOR LOCAL STRESSES. (CHECK TO SEE IF PAD IS REQUIRED).

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:

EL. Y

PIPE SUPPORT MARK NO.

FPS-64-___

VERT. LOAD P (USER DEFINED) = USER DEFINED
HOR. LOAD H (USER DEFINED) = USER DEFINED

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:
1.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING: EL. Y.
2.) FOR ALTERNATE CONNECTIONS DETAILS, SEE PAGE 2.

DESIGN LOAD:
VERTICAL LOAD: P (USER DEFINED) = USER DEFINED
HORIZONTAL LOAD: H (USER DEFINED) = USER DEFINED

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE PLATE DETAIL
FPS-65A

VESSELT PLATE DETAIL
(FOR INSULATED VESSELS ONLY)
FPS-65B

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
**DESIGN LOAD:**

**PS-80A**
- VERT. LOAD, P (USER DEFINED) = 
- HORIZ. LOAD (USER DEFINED) = 

**PS-80B**
- VERT. LOAD, P (USER DEFINED) = 
- HORIZ. LOAD (USER DEFINED) = 

**NOTES:**

1. MAX. LOADS ARE FOR BRACKETS ONLY. CHECK VESSELS FOR LOCAL STRESSES. (CHECK IF PAD REQ'D.).

2. THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   - EL. Y

**PIPE SUPPORT MARK NO.**

- FPS-80
- A, B, OR C
- TYPE (LAST LETTER ONLY)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:

1.) SUFFIXES A, B, C & D APPLY TO INSULATED LINES ONLY.

2.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:
   A. ROD CLAMP
   B. NPS MATL. 1 OR 2 FOR CLAMP B AND C

PIPE SUPPORT MARK NO.

---

1/4" ROD CLAMP

---

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
### Short Length Rod Hanger from Adjacent Steel, FPH-1

**(For piping up to NPS 2 1/2)**

#### Clevis Clamp (Type A)

| Pipe Size | Max. Load Lbs. | | | | | |
|-----------|----------------|---|---|---|---|---|---|
|           | A C E H L J S S₁ | --- | --- | --- | --- | --- | --- |
| 1/2       | 600 3/8 7/16 7/8 1 1/16 2 1/8 1/4 1 X 1/8 1 X 1/8 | --- | --- | --- | --- | --- | --- |
| 3/4       | 600 3/8 1 2 1 7/8 2 7/16 1/4 1 X 1/8 1 X 1/8 | --- | --- | --- | --- | --- | --- |
| 1         | 600 3/8 5/8 1 1/4 2 1/8 2 13/16 1/4 1 X 1/8 1 X 1/8 | --- | --- | --- | --- | --- | --- |
| 1 1/4     | 600 3/8 7/8 1 3/4 2 9/16 3 7/16 1/4 1 X 1/8 1 X 1/8 | --- | --- | --- | --- | --- | --- |
| 1 1/2     | 600 3/8 1 1/16 2 1/8 3 4 1/4 1 X 1/8 1 X 1/8 | --- | --- | --- | --- | --- | --- |
| 2         | 600 3/8 1 5/8 2 15/16 3 11/16 4 7/8 1/4 1 X 1/8 1 X 1/8 | --- | --- | --- | --- | --- | --- |
| 2 1/2     | 1100 1 2 3 13/16 4 11/16 6 1/8 3/8 1 1/4 X 3/16 1 1/4 X 3/16 | --- | --- | --- | --- | --- | --- |

#### 2-Bolt Clamp (Type B)

| Pipe Size | Max. Load Lbs. | | | | | |
|-----------|----------------|---|---|---|---|---|---|
|           | Mat. 1 C.S. Mat. 2 A387-G22 | --- | --- | --- | --- | --- | --- |
|           | F B J T W | --- | --- | --- | --- | --- | --- |
| 1/2       | 500 445 315 230 1 1/2 5/16 1/8 1 | --- | --- | --- | --- | --- | --- |
| 3/4       | 500 445 315 230 1 1/8 1/2 5/16 1/8 1 | --- | --- | --- | --- | --- | --- |
| 1         | 500 445 315 230 1 3/8 1/2 5/16 1/8 1 | --- | --- | --- | --- | --- | --- |
| 1 1/4     | 500 445 315 230 1 3/8 1/2 5/16 1/8 1 | --- | --- | --- | --- | --- | --- |
| 1 1/2     | 800 715 530 350 1 5/8 1/2 5/16 1/8 1 | --- | --- | --- | --- | --- | --- |
| 2         | 1040 930 660 480 2 1/8 1/2 1/4 1 | --- | --- | --- | --- | --- | --- |
| 2 1/2     | 1040 930 660 480 2 5/8 5/8 1/2 1/4 1 | --- | --- | --- | --- | --- | --- |

#### 3-Bolt Clamp (Type C)

| Pipe Size | Max. Load Lbs. | | | | | |
|-----------|----------------|---|---|---|---|---|---|
|           | Mat. 1 C.S. Mat. 2 A387-G22 | --- | --- | --- | --- | --- | --- |
|           | F E B J T W | --- | --- | --- | --- | --- | --- |
| 1/2       | 950 850 600 440 15/16 2 7/16 5/16 3/8 3/16 1 | --- | --- | --- | --- | --- | --- |
| 3/4       | 950 850 600 440 15/16 2 7/16 5/8 3/8 3/16 1 | --- | --- | --- | --- | --- | --- |
| 1         | 950 850 600 440 1 1/6 2 9/16 5/8 3/8 3/16 1 | --- | --- | --- | --- | --- | --- |
| 1 1/4     | 950 850 600 440 1 1/4 2 11/16 5/8 3/8 3/16 1 | --- | --- | --- | --- | --- | --- |
| 1 1/2     | 1545 1380 1000 745 1 13/16 4 1/8 1 1/16 5/8 1/4 1 1/4 | --- | --- | --- | --- | --- | --- |
| 2         | 1545 1380 1000 745 2 1/8 5 1/8 1 1/16 5/8 1/4 1 1/4 | --- | --- | --- | --- | --- | --- |
| 2 1/2     | 1545 1380 1000 745 2 5/16 5 3/8 1 1/16 5/8 1/4 1 1/4 | --- | --- | --- | --- | --- | --- |

Dimensions are given in feet and/or inches.
LONG LENGTH ROD HANGER FROM ADJACENT STEEL, FPH-2
(FOR PIPING UP TO NPS 2 1/2)

ROD DIA. X 3

EXIST. STEEL (TYP.)

JAM NUT

TURNBUCULE
(6" GAP)

2 OR 3 BOLT CLAMP

CLEVIS CLAMP
SEE PAGE 2
(SPECIFY MATL.)

INSULATION

PIPE SUPPORT MARK NO.

FOR CLAMP TYPES B & C MATL:
1 = CARBON STEEL
2 = ASTM A387, GR 22

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
### CLEVIS CLAMP
(TYPE A)

### 2-BOLT CLAMP
(TYPE B)

### 3-BOLT CLAMP
(TYPE C)

Dimensions are given in feet and/or inches.
PROCESS INDUSTRY PRACTICES
FABRICATION/INSTALLATION DETAILS

GUIDE FOR INSULATED HORIZ. PIPING FROM ADJ. STEEL, FPG-1
(FOR PIPING UP TO NPS 2 1/2)

PLAN

SECTION A-A

PIPE SUPPORT MARK NO.
FPG-1

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
GUIDE FROM ADJACENT STEEL, FPG–3
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION

SECTION A–A

PIPE SUPPORT MARK NO.

FPG–3

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
STOP FOR HORIZONTAL PIPING FROM ADJACENT STEEL, FPG-6
(FOR PIPING UP TO NPS 2 1/2)

TO SUIT

THREE SIDES 3/16"

SHOE, CALL OUT SEPARATELY

L2X 2X 1/4X 3" LG (TYP.)

1/16" (TYP.)

DO NOT WELD THIS SIDE (TYP.)

EXISTING STEEL

ELEVATION

PIPE SUPPORT MARK NO.

FPG-6

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
STOP FOR HORIZONTAL PIPING FROM ADJACENT STEEL, FPG-8
(FOR PIPING UP TO NPS 2 1/2)

EXISTING BEAM

ELEVATION

PIPE SUPPORT MARK NO.

FPG-8

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:
1.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS:
   EL. Y.
2.) OMIT PLATES FOR UNINSULATED VESSEL

ELEVATION

PIPE SUPPORT MARK NO.

FPG-10

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTE:
THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS:
EL. Y.

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ELEVATION

ALTERNATE CONNECTIONS ADJACENT TO COLUMN

ELEVATION

ALTERNATE CONNECTIONS ADJACENT TO BEAM

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ELEVATION

ALTERNATE CONNECTIONS ADJACENT TO COLUMN

ELEVATION

ALTERNATE CONNECTIONS ADJACENT TO BEAM

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:
1.) OMIT PLATE FOR UNINSULATED VESSELS AND WELD C4X5.4 CHANNEL TO PAD.
2.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS:
   EL. Y.

PIPE SUPPORT MARK NO.

FPG-17--
A

TYPE (LAST LETTER ONLY)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
GUIDE FOR VERTICAL PIPING, FPG-17
(FOR PIPING UP TO NPS 2 1/2)

PLAN
FPG-17B

ELEVATION
FPG-17B

CLEAR (INSUL. + 2")
3/8" 

SPECIFY ON ISO IF
OTHER THAN 1/2 LENGTH
OF SHOE

4"

CLEAR

3/16"

1/2"

1/16"

3/4"

1/2"

1/2"

1/16"

3/4"

1/4"

1/4"

C4X5.4
L2X2X1/4

BAR 1 1/2"X 1/4"X 3"LG
(TYP. 2)

C4X5.4
L2X2X1/4

(CURVE 2)

(TYP. 2)

1/4"

(TYP. 2)

1/16"

SPECIFY ON ISO IF
OTHER THAN 1/2 LENGTH
OF SHOE

MINIMUM

3"

6"

3/8 center

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
EXISTING COLUMN

PLAN

FPG-17-C (ALTERNATE CONN. FOR FPG-17A)
FPG-17-D (ALTERNATE CONN. FOR FPG-17B)

FPG-17-E (ALTERNATE CONN. FOR FPG-17A)
FPG-17-F (ALTERNATE CONN. FOR FPG-17B)

ELEVATION

FPG-17-G (ALTERNATE CONN. FOR FPG-17A)
FPG-17-H (ALTERNATE CONN. FOR FPG-17B)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
GUIDE ADJACENT TO GRADE OR STEEL,
FPG–21 A&B (FOR PIPING UP TO NPS 2 1/2)

ELEVATION

PLAN
FPG–21A (FOR NORTH – SOUTH GUIDE)
FPG–21B (FOR EAST – WEST GUIDE)

PIPE SUPPORT MARK NO.
FPG–21

TYPE A OR B

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
1" GROUT (MAX.)
IF REQUIRED

TOP OF FINISHED GRADE

ELEVATION

9/16" DIA. HOLES IN PLATE
AND 1/2" DIA. CINCH
ANCHORS 5 1/2" LONG. (TYP.)

L2X2X1/4X3" LONG
(TYP.)

3" (TYP.)

1/16" CLEAR
(TYP.)

3/8"X 10"X 10" (TYP.)

PLAN
FPG-21C

PIPE SUPPORT MARK NO.
FPG-21C

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) STUD DIA. IS 1/16" LESS THAN HOLE SIZE ‘H’ IN TABLE.

2.) PROVIDE EACH STUD WITH TWO HEX NUTS.

3.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING: EL. Y

<table>
<thead>
<tr>
<th>STUD SIZE</th>
<th>DISC SPRING (BY USER)</th>
<th>PIPE SLEEVE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/8&quot;</td>
<td>BY USER</td>
<td>1 1/4&quot; XXS</td>
</tr>
<tr>
<td>1&quot;</td>
<td>BY USER</td>
<td>1 1/2&quot; XXS</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

TYPE (LAST LETTER ONLY) — HOLD DOWN TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
MINIMUM RADIUS

<table>
<thead>
<tr>
<th>T</th>
<th>M.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/16&quot;</td>
<td>1T</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>2T</td>
</tr>
</tbody>
</table>

HOLD DOWN I

FPG–29A & FPG–29B

<table>
<thead>
<tr>
<th>MARK NO.</th>
<th>PIPE SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>R</th>
<th>T</th>
<th>HOLD DOWM</th>
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<tbody>
<tr>
<td>FPG–29A–1</td>
<td>1&quot;</td>
<td>7 3/8&quot;</td>
<td>2 1/2&quot;</td>
<td>1 3/8&quot;</td>
<td>3&quot;</td>
<td>5/16&quot;</td>
<td>2 1/2&quot;</td>
<td>1 1/4&quot;</td>
<td>15/16&quot;</td>
<td>11/16&quot;</td>
<td>3/16&quot;</td>
<td>I</td>
</tr>
<tr>
<td>FPG–29B–1</td>
<td>1 1/2&quot;</td>
<td>8&quot;</td>
<td>2 13/16&quot;</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>1/2&quot;</td>
<td>2 1/2&quot;</td>
<td>1 1/4&quot;</td>
<td>15/16&quot;</td>
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<td>3/16&quot;</td>
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<td>9 5/8&quot;</td>
<td>3 3/8&quot;</td>
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<td>11/16&quot;</td>
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<td>1 1/2&quot;</td>
<td>1 1/16&quot;</td>
<td>1 7/32&quot;</td>
<td>1/4&quot;</td>
<td>II</td>
</tr>
<tr>
<td>FPG–29B–2</td>
<td>1 1/2&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
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DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ROD SIZE</th>
<th>PIN OR BOLT</th>
<th>R MIN.</th>
<th>D MIN.</th>
<th>T MIN.</th>
<th>H</th>
<th>MAX. LOAD (USER DEFINED)</th>
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<tbody>
<tr>
<td>A</td>
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<td>1 1/4&quot;</td>
<td>2 1/2&quot;</td>
<td>3&quot;</td>
<td>1/4&quot;</td>
<td>9/16&quot; USER DEFINED</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot;</td>
<td>5/8&quot;</td>
<td>1 1/4&quot;</td>
<td>2 1/2&quot;</td>
<td>3&quot;</td>
<td>1/4&quot;</td>
<td>11/16&quot; USER DEFINED</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

ATF-1

TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
WELDING CLIP, ATF-2
(FOR PIPING UP TO NPS 2 1/2)

---

**ELEVATION**

---

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ROD SIZE</th>
<th>A</th>
<th>B</th>
<th>S</th>
<th>T</th>
<th>Z</th>
<th>MAXIMUM RECOMMENDED LOAD (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3/8&quot;</td>
<td>2 7/8&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>7/16&quot;</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot;</td>
<td>2 7/8&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>9/16&quot;</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

---

PIPE SUPPORT MARK NO.:

ATF-2

---

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
WELDING CLIP, ATF-3
(FOR PIPING UP TO NPS 2 1/2)

EXISTING STRUCTURE

TYP 3/16

R

H

B/2

B

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ROD SIZE</th>
<th>BOLT SIZE</th>
<th>R</th>
<th>B</th>
<th>D MIN.</th>
<th>S</th>
<th>T</th>
<th>H</th>
<th>MAXIMUM RECOMMENDED LOAD (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3/8&quot;</td>
<td>1/2&quot; X 2 1/2&quot;</td>
<td>7/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>9/16&quot;</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot;</td>
<td>5/8&quot; X 2 1/2&quot;</td>
<td>7/8&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
<td>1 1/4&quot;</td>
<td>1/4&quot;</td>
<td>11/16&quot;</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

ATF-3

TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
DESIGN LOAD:
MAX. LOAD (USER DEFINED) = USER DEFINED

NOTES:
1.) EXISTING BEAM SHALL BE INVESTIGATED FOR ADDITIONAL ECCENTRIC LOAD.
2.) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWINGS: EL. Y

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
HANGER ATTACHMENT, ATF-7
(FOR PIPING UP TO NPS 2 1/2)

EXISTING BEAM

L3X 3X 3/8

HOLE DIA. = BOLT DIA. + 1/16"

EL. Y

1 5/8"

A

1'6" MAX.

1 1/2"

ELEVATION

ATF-7A

NOTE:

1) EXISTING SUPPORTING MEMBERS TO BE CHECKED FOR ADDITIONAL PIPING LOAD AND TORSION.

2) THE FOLLOWING DIMENSIONS AND/OR INFORMATION ARE SHOWN ON PIPING DRAWING:

EL. Y

DESIGN LOAD:

MAX. VERT. LOAD (USER DEFINED) = USER DEFINED

PIPE SUPPORT MARK NO.

ATF-7 - 

A TYPE (LAST LETTER ONLY)

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
HANGER ATTACHMENT, ATF-7
(FOR PIPING UP TO NPS 2 1/2)

ELEVATION
ATF-7B

DESIGN LOAD:
MAX. VERT. LOAD (USER DEFINED) = USER DEFINED

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
DESIGN LOAD:

MAX. VERT. LOAD (USER DEFINED) = USER DEFINED

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
SPECIAL STEEL WASHER PLATE, ATF–8
(FOR PIPING UP TO NPS 2 1/2)

PLAN

ELEVATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>W X T</th>
<th>DIA. ROD</th>
<th>H DIA.</th>
<th>D/D</th>
<th>MAX. ALLOW. LOAD LBS. (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>BAR 3&quot;X 1/4&quot;</td>
<td>3/8&quot;</td>
<td>7/16&quot;</td>
<td>1&quot;</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>B</td>
<td>BAR 3&quot;X 1/4&quot;</td>
<td>1/2&quot;</td>
<td>9/16&quot;</td>
<td>1 1/2&quot;</td>
<td>USER DEFINED</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

ATF–8

TYPE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
HANGER ATTACHMENT, ATF-10
(FOR PIPING UP TO NPS 2 1/2)

ELEVATIONS

NOTE
1) FOR INSULATION THICKNESS
OVER 3 1/2" A DIMENSION SHALL BE 7"

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NOMINAL PIPE SIZE</th>
<th>H</th>
<th>PIN OR BOLT DIAM.</th>
<th>BAR SIZE (USER DEFINED)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UP TO 1 1/2&quot;</td>
<td>9/16&quot;</td>
<td>1/2&quot;</td>
<td>2&quot; X 1/4&quot;</td>
</tr>
<tr>
<td>A</td>
<td>2&quot; TO 2 1/2&quot;</td>
<td>9/16&quot;</td>
<td>1/2&quot;</td>
<td>3&quot; X 1/4&quot;</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
HANGER ATTACHMENT, ATF-11
(FOR PIPING UP TO NPS 2 1/2)

ELEVATIONS

NOTE
1) FOR INSULATION THICKNESS
OVER 3 1/2" A DIMENSION SHALL
BE 9"

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NOMINAL PIPE SIZE</th>
<th>H</th>
<th>PIN OR BOLT DIAM.</th>
<th>BAR SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>UP TO 1 1/2&quot;</td>
<td>9/16&quot;</td>
<td>1/2&quot;</td>
<td>2&quot;X 1/4&quot;</td>
</tr>
<tr>
<td>B</td>
<td>2&quot; TO 2 1/2&quot;</td>
<td>9/16&quot;</td>
<td>1/2&quot;</td>
<td>3&quot;X 1/4&quot;</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
PIPE SIZE VARIES (TYP.)

BAR 2"X 1/4"

FIELD CUT TO SUIT (TYP.)

RELIEF VALVE

3/16" (TYP.)

SECTION 'A-A'

PIPE SUPPORT MARK NO.

ATF-14

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
panies Industry Practices
Fabrication/Installation Details

Bracket, ATF-17
(For Piping up to NPS 2 1/2)

ELEVATION
ATF-17A & ATF-17B

ELEVATION
ATF-17C & ATF-17D

<table>
<thead>
<tr>
<th>Type</th>
<th>Member Size</th>
<th>Pipe Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>L 1 1/2X 1 1/2X 1/4</td>
<td>Up To 1 1/2&quot;</td>
</tr>
<tr>
<td>B</td>
<td>L 1 1/2X 1 1/2X 1/4</td>
<td>Up To 1 1/2&quot;</td>
</tr>
<tr>
<td>C</td>
<td>L 2 1/2X 2 1/2X 5/16</td>
<td>2&quot; &amp; 2 1/2&quot;</td>
</tr>
<tr>
<td>D</td>
<td>L 2 1/2X 2 1/2X 5/16</td>
<td>2&quot; &amp; 2 1/2&quot;</td>
</tr>
</tbody>
</table>

1.) The following dimensions and/or information are shown on piping drawing:
   EL. Y

Pipe Support Mark No.
ATF-17

Dimensions are given in feet and/or inches.
FORGED STEEL CLEVIS, CLF
(FOR PIPING UP TO NPS 2 1/2)

<table>
<thead>
<tr>
<th>TYPE NO.</th>
<th>MAX. TAP SIZE IN.</th>
<th>MAX. PIN SIZE IN.</th>
<th>A INCHES</th>
<th>D INCHES</th>
<th>H INCHES</th>
<th>T INCHES</th>
<th>W INCHES</th>
<th>MAX. LOAD 650° F.</th>
<th>750° F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3/8&quot;</td>
<td>1/2&quot;</td>
<td>3 11/16&quot;</td>
<td>1 7/16&quot;</td>
<td>5/8&quot;</td>
<td>5/16&quot;</td>
<td>1 1/16&quot;</td>
<td>610</td>
<td>540</td>
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<tr>
<td>2</td>
<td>1/2&quot;</td>
<td>5/8&quot;</td>
<td>3 11/16&quot;</td>
<td>1 7/16&quot;</td>
<td>5/8&quot;</td>
<td>5/16&quot;</td>
<td>1 1/16&quot;</td>
<td>1130</td>
<td>1010</td>
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</table>

PIPE SUPPORT MARK NO.

CLF--

TYPE NO. 1 OR 2

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
STANDARD U-BOLT, UBF
(FOR PIPING UP TO NPS 2 1/2)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>NPS</th>
<th>ROD SIZE</th>
<th>DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4</td>
<td>3/4&quot;</td>
<td>1/4&quot;</td>
<td>C 1 1/8&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E 2 1/2&quot;</td>
</tr>
<tr>
<td>1</td>
<td>1&quot;</td>
<td>1/4&quot;</td>
<td>C 1 5/8&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E 2 1/2&quot;</td>
</tr>
<tr>
<td>1 1/4</td>
<td>1 1/4&quot;</td>
<td>3/8&quot;</td>
<td>C 2 1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D 3/8&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E 3 1/4&quot;</td>
</tr>
<tr>
<td>1 1/2</td>
<td>1 1/2&quot;</td>
<td>3/8&quot;</td>
<td>C 2 1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D 3/8&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E 3 7/16&quot;</td>
</tr>
<tr>
<td>2</td>
<td>2&quot;</td>
<td>3/8&quot;</td>
<td>C 3 7/16&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D 3/4&quot;</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>E 3&quot;</td>
</tr>
<tr>
<td>2 1/2</td>
<td>2 1/2&quot;</td>
<td>1/2&quot;</td>
<td>C 3 1/2&quot;</td>
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<td></td>
<td>D 3 1/2&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E 3 1/2&quot;</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

UBF--

NPS
SIZE

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
STRAIGHT OR EYE ROD, RF/HF
(FOR PIPING UP TO NPS 2 1/2)

EYE ROD
TYPE HF

STRAIGHT ROD
TYPE RF

<table>
<thead>
<tr>
<th>TYPE</th>
<th>D (DIA.)</th>
<th>E (DIA.)</th>
<th>L (LENGTH)</th>
<th>MAX. LOAD 650° F</th>
<th>MAX. LOAD 650° F</th>
</tr>
</thead>
<tbody>
<tr>
<td>EYE-ROD</td>
<td>3/8&quot;</td>
<td>9/16&quot;</td>
<td>2 1/2&quot;</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>STR-ROD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF-1A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF-1A</td>
<td>1/2&quot;</td>
<td>11/16&quot;</td>
<td>2 1/2&quot;</td>
<td>USER DEFINED</td>
<td>USER DEFINED</td>
</tr>
<tr>
<td>RF-2A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HF-2A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

SUB-TYPE (1A OR 2A)
TYPE (HF OR RF)
DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.
NOTES:

1.) UNLESS OTHERWISE SPECIFIED ON PIPING DRAWINGS:
   FOR TEMPERATURES UP TO 350°F USE 12" LONG SHOE.
   FOR TEMPERATURES 350°F TO 750°F USE 1'-6" LONG SHOE.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>D</th>
<th>L</th>
<th>L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4&quot;</td>
<td>1'-0&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>B</td>
<td>4&quot;</td>
<td>1'-6&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>C</td>
<td>6&quot;</td>
<td>1'-0&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>D</td>
<td>6&quot;</td>
<td>1'-6&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>
NOTES:

1.) UNLESS OTHERWISE SPECIFIED ON PIPING DRAWINGS:
   FOR TEMPERATURES UP TO 350°F
   USE 12" LONG SHOE.
   FOR TEMPERATURES 350°F TO 750°F
   USE 1’-6” LONG SHOE.

2.) NO GALVANIZING IS PERMITTED FOR ANY COMPONENT
    IF STAINLESS STEEL CLAMP IS SPECIFIED.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>D</th>
<th>L</th>
<th>L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>4&quot;</td>
<td>1’-0”</td>
<td>5”</td>
</tr>
<tr>
<td>K</td>
<td>4&quot;</td>
<td>1’-6”</td>
<td>8”</td>
</tr>
<tr>
<td>M</td>
<td>6&quot;</td>
<td>1’-0”</td>
<td>5”</td>
</tr>
<tr>
<td>N</td>
<td>6”</td>
<td>1’-6”</td>
<td>8”</td>
</tr>
</tbody>
</table>

PIPE SUPPORT MARK NO.

FS-1

DIMENSIONS ARE GIVEN IN FEET AND/OR INCHES.