1.0 Scope

This standard covers the fabrication and installation procedures for engineered pipe supports, including spring hangers. This generally applies to piping 2" diameter and larger, and includes all process piping.
For all other piping, BASF Technical Standard 11-130-10 (Field Engineered Pipe Supports) shall apply.

2.0 Standards and Data Sheets

American Institute of Steel Construction (AISC)

AISC	Manual of Steel Construction

American Society of Mechanical Engineers (ASME) standards:

B31.1	Power Piping
B31.3	Process Piping

American National Standards Institute (ANSI)

B18.2.1	Square and Hex Bolts and Screws (Inch Series)
B18.2.2	Square and Hex Nuts (Inch Series)
B1.1	Unified Screw Threads (UN and UNR Thread Form)
B1.20.1	Pipe Threads, General Purpose (Inch Series)

Research Council on Structural Connections (Endorsed by AISC)

Specification for Structural Joints Using ASTM A325 or A490 Bolts

American Welding Society (AWS)

D1.1	Structural Steel Welding Code

BASF Technical Standards

11-130-10	Field Engineered Pipe Supports
12-130-02	Piping Design Requirements
11-130-12	Piping Flexibility and Stress Analysis
18-225-03	Field Pressure Testing of Piping
32-210-04	Concrete Foundations – Bolts in Concrete
33-211-01	Specifications for Structural Steel

Manufacturer's Standardization Society (MSS)

SP-58	Pipe Hanger and Support-Materials, Design and Manufacture
SP-69	Pipe Hangers and Supports - Selection and Application
MSS-SP-89	Pipe Hangers and Supports - Fabrication and Installation Practices

2.1 Refer to BASF Technical Standard 11-130-12 for information regarding flexibility analysis for use in determining proper pipe support locations.

3.0 Pipe Support Detail Drawings

3.1 Detail drawings of spring hangers and special pipe supports are issued per project. Details of standard pipe supports are included in this Standard. The detail drawings show specific information which consists of (but not limited to) the following:

- Material of Construction
- Load and Movement Data
- Supplementary Steel
- Field or Shop Welds
- Shop or Field Drilled Holes
- Reference drawings and or line number
- Support Identity

3.2 Dimensioning of the details shall be to a tolerance of 1/8" ±.

3.3 The material call-out on the detail drawing indicates all components of the support assembly. Identification of standard catalog components is made by manufacturer's figure number, type and size. These figure numbers refer to "Grinnell Pipe Hanger Catalog" - (latest Edition). The Mechanical Contractor may substitute components from other Vendors, provided they meet the load carrying capabilities of the components shown on the detail drawings.

3.4 Operating and installation loads, direction and amount of vertical movement will be shown on the detail drawing for variable or constant spring hangers.

3.5 For supplementary steel furnished as part of the support assembly complete information will be shown on the detail drawing. Supplementary steel is shown on the detail drawing, which is either existing in-place or not furnished, and will be clearly marked.

3.6 All field welds and shop welds of non-catalog items will be indicated on the detail drawing using American Welding Society standard welding symbols.

3.7 The location of pipe supports/assemblies is usually shown dimensionally on the piping isometric (fabrication & installation) drawing. In some cases a separate “Pipe Support Location Plan” may be generated.

3.8 The support identification on the detail drawing will consist of a prefix (to identify the general type of the support), and a serial number. Examples of prefixes are as follows:

- BS Base Ell/Line Support
- DL Dummy Leg Support
- DS Directional Stop
- F Foundation Detail
- PA Pipe Anchor
- PG Pipe Guide

PH Pipe Hanger
PL Pipe Lug
PS Pipe Support
S Shoe
SH Spring Hanger
VC Vessel Clip
UB U-Bolt
WP Wear Pad

(Section 10.0 shows specific details.)
Example of support identification mark number: PS-80.

4.0 Dimensional Tolerances

4.1 This section covers maximum tolerances in fabricated pipe supports except for cast or forged products.

4.2 Tolerances for raw materials such as strip, sheet, bar, plate, pipe, tubing, structural and bar size shapes shall be in accordance with recognized standards and specifications. Tolerances for casting and forgings shall be to the individual manufacturers standards.

4.3 Manufacturing Tolerances

4.3.1 Cut Lengths - Linear
- a) Hanger rods ± 1/2 in.
- b) Structural shapes, pipe, tubing ± 1/8 in.
- c) Plates & bars ± 1/8 in.

4.3.2 Threads
- a) Screw threads to ASME B1.1, Class 1A, 2A and 2B
- b) Pipe threads to /ASME B1.20.1

4.3.3 Weld Sizes - all welds plus only, no minus.

4.3.4 Angularity - all manufacturing methods to ± 4 degrees.

4.3.5 Holes - Drilled or Punched Only
- a) Location - center to edge, or center to center, ± 1/16 in.
- b) Diameter - plus .2 times metal thickness or minus 1/32 in.

5.0 Fabrication

This section covers fabrication of pipe support components and assemblies.

5.1 Material of construction shall be ASTM A992 for W and WT rolled shapes and ASTM A36 for all others unless otherwise noted. Plates, rods, bars, etc., which are used for the fabrication of support assemblies may be cut to shape or size by shearing, sawing, machining, grinding or thermal cutting.

5.2 Thermal cutting processes shall be suitable for the material to which it is applied. After thermal cutting, slag shall be removed prior to further fabrication or use. Discoloration remaining on the flame cut surface is not considered to be detrimental oxidation.

5.3 Drilling and punching shall be performed as required by drawings and specifications.

5.4 Screw threads shall be in conformance with ASME B1.1 Class 1A, 2A and 2B for coarse thread series and Class 2A & 2B for the eight thread series.

5.5 Pipe threads shall be in accordance with ASME B1.20.1 either straight or tapered as required.

5.6 All threaded rod shall be hot-dip galvanized.

5.7 Welding shall be performed where indicated on the detail drawings in accordance with the welded joint requirements specified in the AISC Manual of Steel Construction. When welding any attachment to a pipe governed by the rules of ASME B31 Codes, such welding shall be to the specific applicable welding procedures which have been qualified in accordance with Section IX of the ASME Boiler & Pressure Vessel Code. A copy of the fabricator's procedures and weld qualification record shall be submitted for owner review and record.

5.8 Bolting of structural components where noted shall be ASTM A325 high strength bolts.

6.0 Finish - (Painting/Galvanizing)

6.1 Fabricated support material shall be painted or galvanized as noted in contract documents and in accordance with BASF Technical Standard 33-211-01. Paint system shall be noted on the contract documents.

6.2 Bolt threads in assembled components may be painted. Stainless steel or other corrosion-resistant material need not be painted.

7.0 Marking

When pipe supports are to be shop fabricated, each pipe support shall have its identifying mark number painted on with water-proof paint in letters at least 3/4" high.

8.0 Pipe Support Installation

This section outlines the recommended field practices during pipe support installation, adjustment, testing and final inspection.

8.1 Engineered pipe supports shall be located in strict accordance with the pipe support location drawing. Relocation and reorientation of any pipe support from the specified location shall not be permitted without written permission of the Principal Construction Engineer.

8.2 Installed pipe supports shall be used only for their intended purpose. They shall not be used for rigging or erection purposes.

8.3 The contractor is responsible for developing an installation sequence giving priority to major components and groups of piping closest to the supporting structure.

8.4 Support Types (with Cautionary Notes)

8.4.1 Rod Hangers, either rigid or spring type, are adjustable vertical assemblies consisting of structural attachment, hanger rod (with or without intermediate components), and pipe attachment. Installation of rod hangers requires either direct attachment to building structure or installation of supplemental framing to existing members.

8.4.2 Brackets are cantilevered members with or without a knee brace, designed to withstand the gravity load and horizontal forces. Brackets may be installed by welding or bolting to structure, poured in-place embedments, or through the use of drilled concrete fasteners. For bolted-on brackets, it is important to tighten threaded fasteners equally to assure proper load distribution.

8.4.3 Anchors may be weldments or clamp type and are used to fix selected points on a piping system in order to control forces, moments and thermal movement in each section of the total pipe run. Installation of anchors may be by bolting or welding to a rigid structure capable of withstanding all of the design forces. The pipe is secured to the anchor by clamping, welding, or both. Integrity of rigid structure should be reviewed.

8.4.4 Guides may be sliding, rolling or spider type. The design is based upon thermal movement, load, direction of travel and thickness of pipe insulation. Guides are used to control piping movement, provide lateral stability, control sway and to assure proper piping alignment at expansion joints and loops. Installation of guides may be by bolting or welding the base to the supporting structure as indicated on the detail drawing. Care must be taken at the time of initial installation to maintain the proper alignment, elevation and clearance.

8.4.5 Base Supports are used to support piping from below. They encompass a family of supports, guides, slides, anchors, springs, etc. Attachment to the pipe may be by bolted-on clamps, U-bolts, or by welding. Load is transferred to the building structure through the use of a cradle, pipe or structural member which may be fastened directly to the building structure, or provided with a base plate. During installation, the supported pipe must be adequately braced to maintain stability until the system is completely installed.

8.4.6 Spring Supports are designed so that they cannot become disengaged by movement of the supported pipe. All springs shall be under compression, so that failure will not result in the complete release of the load. Hot load and cold load settings shall be permanently stamped on the scale plate of each spring support. The spring shall be factory-set to the calculated cold load (shown on the support detail drawing) by means of an easily

removable spacer piece or pin. This device shall be so designed that the support assembly will act as a rigid support before its removal. It shall be clearly labeled with a caution tag warning that the device must be removed before start up. Do not remove this device, or make any load or travel scale adjustments until hydrotest (if required) is complete. After installation, spring supports shall first be checked for indicated load, and adjustment made to the spring turnbuckle or adjustment device to compensate for initial deadload deflections or for minor dimensional errors. Special attention should be paid to spring supports on piping connected to rotating machinery. Such piping in steam, air, gas or vapor service should be balanced by the spring-supports before flange connections are bolted up to ensure that practically no piping loads are imposed on the machinery prior to start-up. This must be achieved without adjusting the load scale setting. Liquid lines to pumps may call for special procedures, and these will be described on the detail sheets when necessary.

Actual piping loads may vary from the calculated loads for a number of reasons and some field adjustment may be necessary.

8.4.7 Before hydrotest (when required), all spring supports shall be inspected at this time, the location, spring support number, installation and possible interference shall be checked. The support location drawing and the support detail drawing provide the necessary information for this check. The pipe shall be free to move up or down the required amount without interfering with other piping, electrical conduit, trays, ductwork or structural steel. The travel stops shall still be in place and the support assembly shall be carrying a load (for example, rods shall be tight or the load flange shall be in contact with the pipe or support shoe).

8.4.8 After hydrotest, in accordance with BASF Technical Standard 18-225-03 (when required), the travel stops shall be removed and the spring support inspected again to check the load setting. On lines which carry liquid, the load indicator will normally be at a position above the cold setting, because the line is empty. If the stops are specifically required to be left in place for the empty condition, a tag must be attached to each stop indicating this.

9.0 Specific Details

9.1 The following pages show pipe supports that have been standardized. Under normal conditions, the pipe supports required for a particular project will consist of standardized details and special details. Specials are supports not used often enough to justify a standard detail, or one in which the complexity of the design is such that an individual detail is required.

9.2 Load limits given are for pipe supports only and not for the structural elements supporting them. Pipe support details, which affect structural elements, shall be coordinated with the Civil/Structural Engineer for the project prior to specifying them on the piping drawings.

9.3 Pipe support details, which affect vessels, shall be coordinated with the Mechanical Engineer for the project prior to specifying them on the piping drawings.

9.4 Some pipe support details indicate alternate bolted connections to field welding for attachments to structural components. Shop welding or shop drilling of holes for field bolting are preferred methods of attachments. The contract documents shall indicate the choice for attachments.

9.5 Unless noted otherwise, pipe support anchoring to concrete shall be "HIT HY 150" HILTI adhesive anchors or Owner approved equal. Minimum depth of embedment (E) into concrete shall be as noted.

9.6 Details for pipe guides (PG) and pipe supports (PS) where only field welding is shown for connection to existing structural member, engineer has option to specify equivalent field bolted connection with minimum 2-5/8" dia bolts and 3/8" thick plate as required.

PIPE SPAN TABLE

Pipe Size	Schedule	Thickness	Maximum Span Between Supports
NPS		inch	feet
½"	S/40	.0109	6.0
½"	S/80S	0.147	7.0
¾"	S/40	0.113	7.9
¾"	S/80S	0.154	9.0
1	S/10S	0.109	8.5
1	S/80	0.179	9.6
1.5	S/10S	0.109	10.3
1.5	S/80	0.200	12.0
2	S/10S	0.109	13.3
2	S/40	0.154	14.8
3	S/10S	0.120	17.5
3	S/40	0.216	20.8
4	S/10S	0.120	20.0
4	S/40	0.237	24.5
6	S/10S	0.134	25.0
6	S/40	0.280	30.7
8	S/10S	0.148	27.8
8	S/40	0.322	35.5
10	S/10S	0.165	31.0
10	S/40	0.365	39.7
12	S/10S	0.180	33.4
12	S/40S	0.375	42.4
14	S/10S	0.188	34.7
14	S/30	0.375	43.6
16	S/10S	0.188	35.8
16	S/30	0.375	45.4
20	S/10S	0.218	34.6
20	S/20	0.375	48.1

NOTES:

1. The span table shown is based on an average value of L2 from Table 1d and 1e in Global Procedure G-P-PI-270 Appendix 1. This aligns more closely with the true end condition (fixed/free) at the rack piping support, and provides for a more conservative span length.
2. Span table calculation based on the following modeling:
    a. Simply supported beam with uniform loading
    b. Low-carbon steels and austenitic stainless steel materials.
    c. Water filled weight case plus insulation/jacket at 3" thickness with a combined weight of 9.54 lf/ft2.
    d. Wind loading not considered. This requirement is part of the Civil/Structural assessment of the pipe rack.

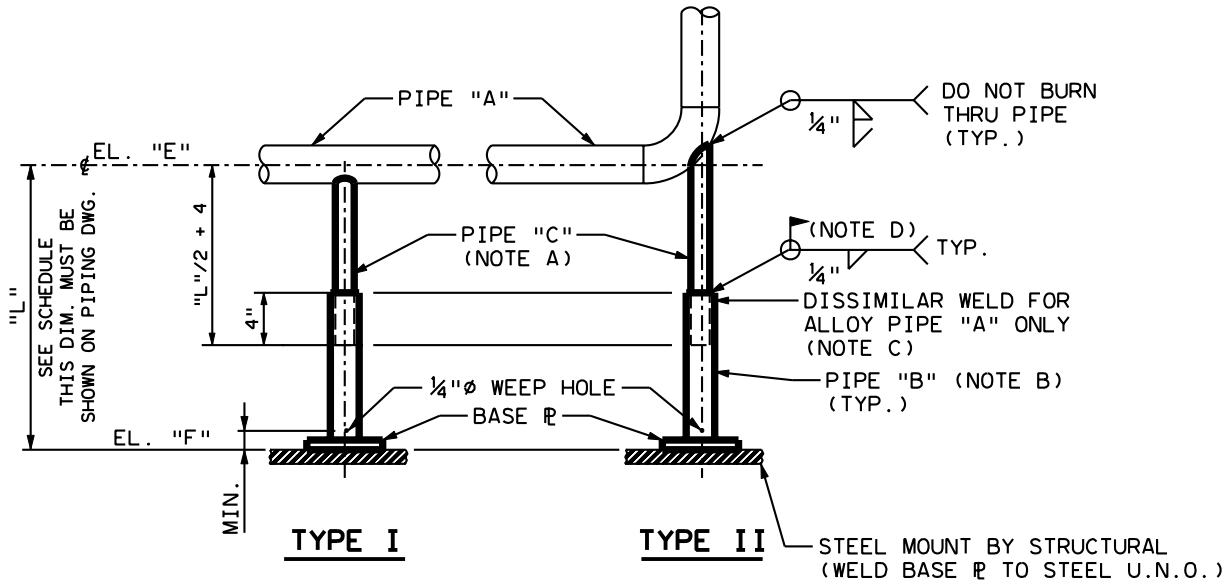
    Maximum stress limited to 5.8 ksi (roughly $0.25S_A$ for low-carbon steel materials, and $0.4S_A$ for austentic SS).Maximum deflection center span limited to < 5/8"

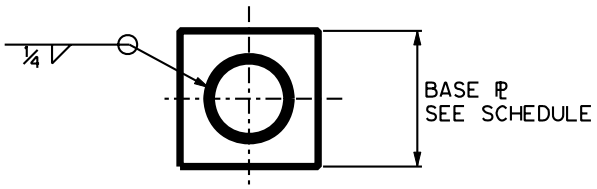
ENGINEERED PIPE SUPPORT SCHEDULE			
NEW DETAIL #	**DESCRIPTION**	**DATE REVISED**	**OLD DETAIL #**
BS - 1	BASE ELL/LINE SUPPORT	08/03	PS - 49
BS - 2	BASE ELL/LINE SUPPORT	08/03	PS - 49
BS - 3	BASE ELL/LINE SUPPORT	08/03	PS - 50
BS - 4	BASE ELL/LINE SUPPORT	08/03	PS - 50
BS - 5	BASE ELL/LINE SUPPORT	08/03	NEW
BS - 6	BASE ELL/LINE SUPPORT	08/03	NEW
DL - 1	DUMMY LEG SUPPORT	08/03	NEW
DL - 2	DUMMY LEG SUPPORT	08/03	NEW
DL - 3	DUMMY LEG SUPPORT	08/03	NEW
DL - 4	DUMMY LEG SUPPORT	08/03	NEW
DL - 5	DUMMY LEG SUPPORT	08/03	PS - 91
DL - 6	DUMMY LEG SUPPORT	08/03	PS - 91
DL - 7	DUMMY LEG SUPPORT	08/03	NEW
DL - 8	DUMMY LEG SUPPORT	08/03	NEW
DS - 1	DIRECTIONAL STOP	08/03	DS - 1
DS - 2	DIRECTIONAL STOP	08/03	DS - 2
DS - 3	DIRECTIONAL STOP	08/03	DS - 3
DS - 4	DIRECTIONAL STOP	08/03	DS - 4
DS - 5	DIRECTIONAL STOP	08/03	DS - 5
F - 1,2, & 3	FOUNDATION DETAIL	08/03	F - 1,2, & 3
F - 4	FOUNDATION DETAIL	08/03	F - 4
PA - 1	PIPE ANCHOR	08/03	NEW
PA - 2	PIPE ANCHOR	08/03	NEW
PG - 1	PIPE GUIDE	08/03	PG - 1
PG - 2	PIPE GUIDE	08/03	PG - 2
PG - 3	PIPE GUIDE	08/03	PG - 3
PG - 4	PIPE GUIDE	08/03	PG - 4
PG - 5 THRU 10	PIPE GUIDE	08/03	PG - 5 THRU 10
PG - 11	PIPE GUIDE	08/03	PG - 11
PG - 12	PIPE GUIDE	08/03	PG - 12
PG - 13	PIPE GUIDE	08/03	PG - 13
PG - 15	ANGLE GUIDE SUPPORT	08/03	PG - 60
PG - 16	ANGLE GUIDE SUPPORT	08/03	PG - 64
PG - 17	ANGLE GUIDE SUPPORT	08/03	PG - 84
PG - 18	ANGLE GUIDE SUPPORT	08/03	PG - 85
PG - 19	ANGLE GUIDE SUPPORT	08/03	PG - 86
PG - 20	ANGLE GUIDE SUPPORT	08/03	PG - 87
PG - 21	ANGLE GUIDE SUPPORT	08/03	PG - 88
PG - 22	ANGLE GUIDE SUPPORT	08/03	PG - 89
PG - 23	ANGLE GUIDE SUPPORT	08/03	NEW
PG - 24	GUIDE FROM VESSEL	08/03	PG - 35
PG - 25	GUIDE FROM VESSEL	08/03	PG - 31
PG - 26	GUIDE FROM VESSEL	08/03	PG - 32
PG - 27	GUIDE FROM VESSEL	08/03	PG - 34
PH - 1	PIPE HANGER SUPPORT	08/03	NEW

Engineered Pipe Supports

ENGINEERED PIPE SUPPORT SCHEDULE			
NEW DETAIL #	**DESCRIPTION**	**DATE REVISED**	**OLD DETAIL #**
PH - 2	PIPE HANGER SUPPORT	08/03	NEW
PH - 3	PIPE HANGER SUPPORT	08/03	NEW
PH - 4	PIPE HANGER SUPPORT	08/03	PH - 20
PH - 5	PIPE HANGER SUPPORT	08/03	PH - 21
PH - 6	PIPE HANGER SUPPORT	08/03	PH - 22
PH - 7	PIPE HANGER SUPPORT	08/03	PH - 23
PH - 8	PIPE HANGER SUPPORT	08/03	PH - 24
PH - 9	PIPE HANGER SUPPORT	08/03	PH - 25
PL - 1	PIPE LUG	08/03	WL - 1 & 2
PS - 1	PIPE FLANGE SUPPORT	08/03	NEW
PS - 2	VERTICAL PIPE SUPPORT	08/03	PS - 41
PS - 3	HORIZONTAL PIPE SUPPORT	08/03	PS - 42
PS - 4	VERTICAL PIPE SUPPORT	08/03	PS - 43
PS - 5	HORIZONTAL PIPE SUPPORT	08/03	PS - 44
PS - 6	HORIZONTAL PIPE SUPPORT	08/03	PS - 45
PS - 7	HORIZONTAL PIPE SUPPORT	08/03	PS - 46
PS - 8	VERTICAL PIPE SUPPORT	08/03	PS - 47
PS - 9	ANGLE PIPE SUPPORT	08/03	PS - 48
PS - 10	ANGLE PIPE SUPPORT	08/03	PS - 61
PS - 11	ANGLE PIPE SUPPORT	08/03	PS - 65
PS - 12	ANGLE PIPE SUPPORT	08/03	PS - 71
PS - 13	W4x13 PIPE SUPPORT	08/03	PS - 80
PS - 14	W4x13 PIPE SUPPORT	08/03	PS - 81
PS - 15	ANGLE PIPE SUPPORT	08/03	PS - 82
PS - 16	ANGLE PIPE SUPPORT	08/03	PS - 83
PS - 17	ANGLE PIPE SUPPORT	08/03	PS - 90
PS - 18	ANGLE PIPE SUPPORT	08/03	PS - 94
PS - 19	ANGLE PIPE SUPPORT	08/03	PS - 92
PS - 20	RISER CLAMP SUPPORT	08/03	PS - 93
PS - 21	ANGLE PIPE SUPPORT	08/03	PS - 95
PS - 22	ANGLE PIPE SUPPORT	08/03	PS - 96
PS - 23	ANGLE PIPE SUPPORT	08/03	NEW
PS - 24	ANGLE PIPE SUPPORT	08/03	NEW
PS - 25	ANGLE PIPE SUPPORT	08/03	PS - 100
PS - 26	ANGLE PIPE SUPPORT	08/03	PS - 101
PS - 27	ANGLE PIPE SUPPORT	08/03	PS - 102
PS - 28	"T" TYPE PIPE SUPPORT	08/03	PS - 103
PS - 29	PIPE SUPPORT FROM COLUMN	08/03	PS - 104
PS - 30	PIPE SUPPORT FROM COLUMN	08/03	PS - 105
PS - 31	PIPE SUPPORT FROM COLUMN	08/03	PS - 106
PS - 32	PIPE SUPPORT FROM COLUMN	08/03	PS - 107
PS - 33	PIPE SUPPORT FROM COLUMN	08/03	PS - 108
PS - 34	TRAPEZE TYPE SUPPORT	08/03	PS - 109
PS - 35	TRAPEZE TYPE SUPPORT	08/03	PS - 110
PS - 36	MULTIPLE PIPE SUPPORT	08/03	PS - 111
PS - 37	MULTIPLE PIPE SUPPORT	08/03	PS - 112
PS - 38	MULTIPLE PIPE SUPPORT	08/03	PS - 113
PS - 39	MULTIPLE PIPE SUPPORT	08/03	PS - 114
PS - 40	STRUCTURAL MEMBER SUPPORT	08/03	PS - 115
PS - 41	STRUCTURAL MEMBER SUPPORT	08/03	PS - 116
PS - 42	STRUCTURAL MEMBER SUPPORT	08/03	PS - 117
PS - 43	STRUCTURAL MEMBER SUPPORT	08/03	PS - 118

ENGINEERED PIPE SUPPORT SCHEDULE			
NEW DETAIL #	**DESCRIPTION**	**DATE REVISED**	**OLD DETAIL #**
PS - 44	MULTIBLE PIPE SUPPORT	08/03	PS - 119
PS - 45	PIPE SUPPORT FROM VESSEL	08/03	PS - 36
PS - 46	PIPE SUPPORT FROM VESSEL	08/03	PS - 37
PS - 47	PIPE SUPPORT FROM VESSEL	08/03	PS - 26
PS - 48	PIPE SUPPORT FROM VESSEL	08/03	PS - 27
PS - 49	PIPE SUPPORT FROM VESSEL	08/03	PS - 28
PS - 50	PIPE SUPPORT FROM VESSEL	08/03	PS - 29
PS - 51	PIPE SUPPORT FROM VESSEL	08/03	PS - 30
PS - 52	PIPE SUPPORT FROM VESSEL	08/03	PS - 33
S - 1 & S - 1A	C. S. PIPE SHOE	08/03	S - 1
S - 2 & S - 2A	C. S. PIPE SHOE	08/03	S - 2
S - 3/3A THRU 5/5A	C. S. PIPE SHOE	08/03	S - 3 THRU 5
S - 6/6A THRU 8/8A	C. S. PIPE SHOE	08/03	S - 6 THRU 8
S - 10	C. S. / ALLOY PIPE SHOE	08/03	NEW
S - 11 & 11A	ALLOY PIPE SHOE	08/03	S - 1AL
S - 12 & 12A	ALLOY PIPE SHOE	08/03	S - 2AL
S - 13/13A THRU 15/15A	ALLOY PIPE SHOE	08/03	S - 3 AL THRU 6AL
S - 16/16A THRU 18/18A	ALLOY PIPE SHOE	08/03	NEW
S - 20 & 20A	ALLOY PIPE SHOE	08/03	NEW
S - 21 & 21A	ALLOY PIPE SHOE	08/03	NEW
S - 22/22A THRU 24/24A	ALLOY PIPE SHOE	08/03	NEW
S-25/25A THRU 27/27A	ALLOY PIPE SHOE	08/03	NEW
S - 29	CRADLE PIPE SHOE	08/03	NEW
S - 30	COLD PIPE SHOE	08/03	SS - 1
S - 31	COLD PIPE SHOE	08/03	NEW
S - 32	COLD PIPE SHOE/GUIDE	08/03	NEW
S - 33	COLD PIPE SHOE/ANCHOR	08/03	NEW
SH - 1	SPRING HANGER SUPPORT	08/03	SH - 10
SH - 2	SPRING HANGER SUPPORT	08/03	SH - 11
SH - 3	SPRING HANGER SUPPORT	08/03	SH - 13
SH - 4	SPRING HANGER SUPPORT	08/03	SH - 15
SH - 5	SPRING CAN SUPPORT	08/03	SH - 14
VC - 1	VESSEL CLIP	08/03	VC - 1
VC - 2	VESSEL CLIP	08/03	VC - 2
VC - 3	VESSEL CLIP	08/03	VC - 3
VC - 4	VESSEL CLIP	08/03	VC - 4
UB - F	U-BOLT FASTENER	08/03	NEW
UB - G	U-BOLT GUIDE	08/03	NEW
WP-1	NON-METALLIC WEAR PAD FOR UNISULATED LINES	01/08	NEW





BASE ℄ DETAIL

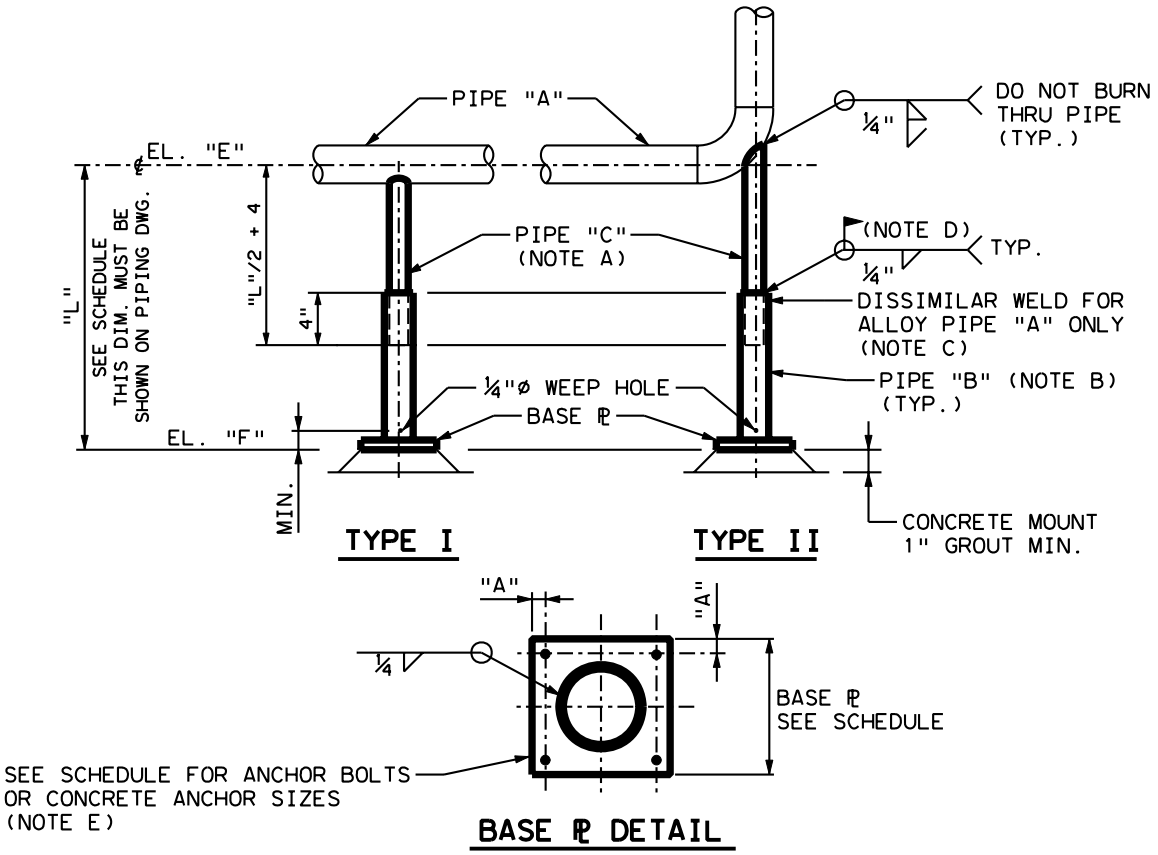
ADJUSTABLE SUPPORT SCHEDULE				
PIPE "A" STD WT MIN	PIPE "B" SIZE	PIPE "C" SIZE	BASE ℄ SIZE	"L" MAX LENGTH
1"-1½"	1½" SCH 80	1" SCH 80	6"x6"x⅜"	3'-0"
2"-3"	2" SCH 40	1½" SCH 80	6"x6"x⅜"	3'-0"
4"-6"	3" SCH 40	2½" STD WT	7"x7"x½"	3'-6"
8"-10"	6" SCH 80	5" STD WT	9"x9"x½"	3'-6"
12"-14"	10" SCH 140	8" STD WT	14"x14"x½"	4'-0"
16"-18"	14" SCH XS	12" STD WT	18"x18"X¾"	4'-0"
20"-24"	18" SCH 80	16" STD WT	20"x20"x¾"	4'-0"
26"-30"	24" SCH 120	12" STD WT	26"x26"x¾"	4'-6"

NOTES:

A. PIPE "C" MATERIAL SHALL BE THE SAME AS PIPE "A".
B. PIPE "B" TO BE A53 GR. B OR EQUAL.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. ON SHOP FABRICATED PIPING UPPER SUPPORT PIPE "C" TO BE INSTALLED IN SHOP, LOWER SUPPORT PIPE "B" WITH BASE ℄ TO BE FABRICATED BY SHOP AND SHIPPED TACK WELDED TO UPPER SUPPORT PIPE "C".

BS-1

PIPE/ELBOW ADJUSTABLE SUPPORT
EITHER DIMENSION "L" OR ELEVATIONS "E" AND "F" ARE REQUIRED ON PIPING DRAWING



BASE ℄ DETAIL

ADJUSTABLE SUPPORT SCHEDULE							
PIPE "A" STD WT MIN	PIPE "B" SIZE	PIPE "C" SIZE	BASE ℄ SIZE	"A" DIM	BOLT		"L" MAX LENGTH
					SIZE	HOLE	
1"-1½"	1½" SCH 80	1" SCH 80	6"x6"x⅜"	1¼"	½"	⅝"	3'-0"
2"-3"	2" SCH 40	1½" SCH 80	6"x6"x⅜"	1¼"	½"	⅝"	3'-0"
4"-6"	3" SCH 40	2½" STD WT	7"x7"x½"	1¼"	½"	⅝"	3'-6"
8"-10"	6" SCH 80	5" STD WT	10"x10"x½"	1¼"	½"	⅝"	3'-6"
12"-14"	10" SCH 140	8" STD WT	14"x14"x½"	1¼"	½"	⅝"	4'-0"
16"-18"	14" SCH XS	12" STD WT	18"x18"X¾"	1½"	⅝"	¾"	4'-0"
20"-24"	18" SCH 60	16" STD WT	20"x20"x¾"	1½"	⅝"	¾"	4'-0"
26"-30"	24" SCH 120	20" STD WT	26"x26"x¾"	1½"	⅝"	¾"	4'-6"

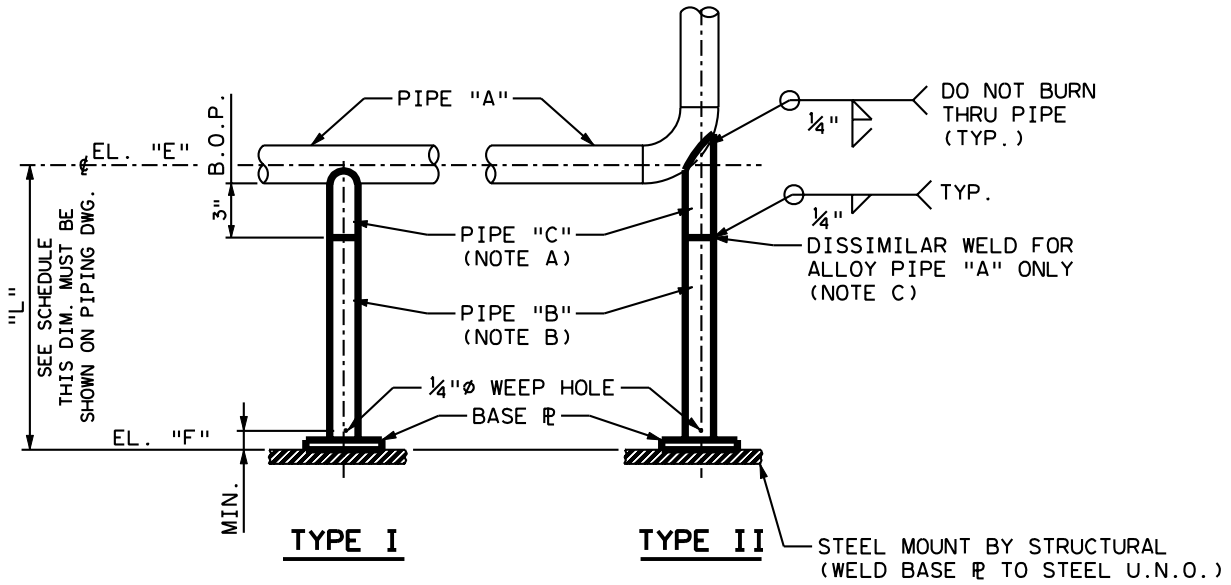
NOTES:

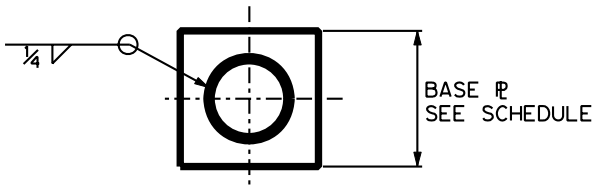
A. PIPE "C" MATERIAL SHALL BE THE SAME AS PIPE "A".
B. PIPE "B" TO BE A53 GR. B OR EQUAL.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. ON SHOP FABRICATED PIPING UPPER SUPPORT PIPE "C" TO BE INSTALLED IN SHOP, LOWER SUPPORT PIPE "B" WITH BASE ℄ TO BE FABRICATED BY SHOP AND SHIPPED TACK WELDED TO UPPER SUPPORT PIPE "C".
E. SEE SECTION 10.5 FOR ANCHOR TYPE. (EMBEDMENT E=MIN.)

BS-2

PIPE/ELBOW ADJUSTABLE SUPPORT
EITHER DIMENSION "L" OR ELEVATIONS "E" AND "F" ARE REQUIRED ON PIPING DRAWING

ENGINEERED PIPE SUPPORTS





BASE PL DETAIL

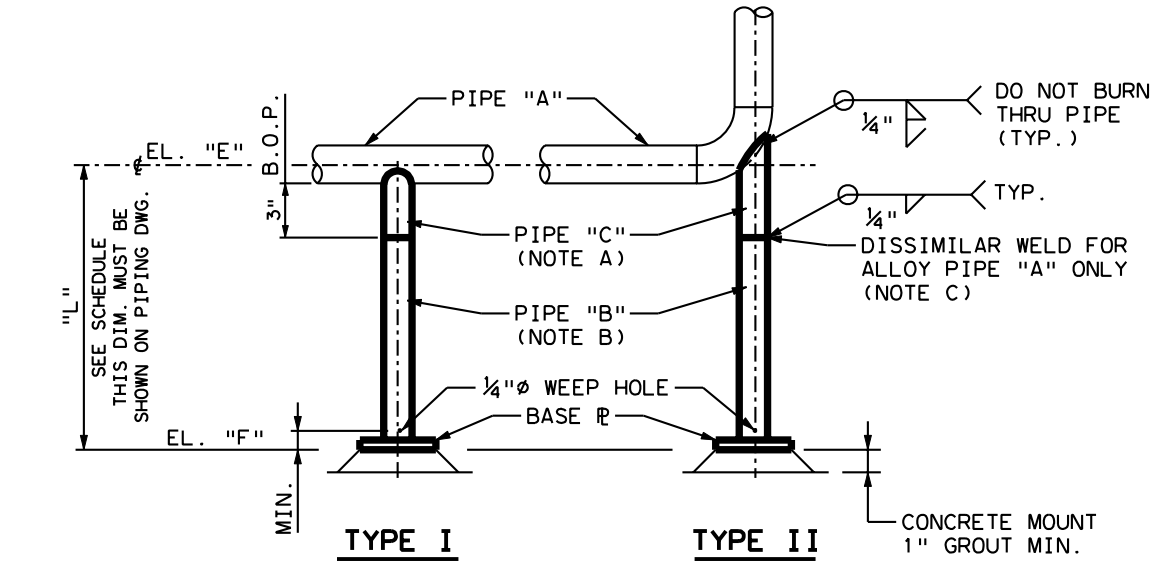
ADJUSTABLE SUPPORT SCHEDULE			
PIPE "A" STD WT MIN	PIPE "B" & "C" CS/ALLOY	BASE PL SIZE	"L" MAX LENGTH
2"	2"	6"x6"x⅜"	3'-0"
3"	2"	6"x6"x⅜"	3'-6"
4"	3"	7"x7"x½"	3'-6"
6"	4"	8"x8"x½"	4'-0"
8"	6"	10"x10"x½"	4'-0"
10"	6"	10"x10"x½"	4'-0"
12"	8"	12"x12"x½"	4'-0"
14"	10"	14"x14"x½"	4'-0"
16"	12"	16"x16"x¾"	4'-0"
18"	14"	18"x18"x¾"	4'-6"
20"	16"	18"x18"x¾"	4'-6"
24"	18"	20"x20"x¾"	4'-6"
30"	24"	26"x26"x¾"	4'-6"

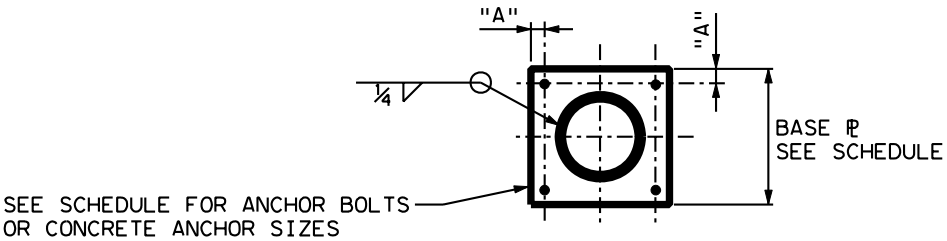
NOTES:

A. PIPE "C" MATERIAL SHALL BE THE SAME AS PIPE "A" AND STD WT.
B. PIPE "B" TO BE STD WT A53 GR. B OR EQUAL.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. ON SHOP FABRICATED PIPING, FABRICATOR TO SUPPLY SUPPORT WELDED TO SPOOL.

BS-3

PIPE/ELBOW NON-ADJUSTABLE SUPPORT/LINE SIZE
EITHER DIMENSION "L" OR ELEVATIONS "E" AND "F" ARE REQUIRED ON PIPING DRAWING





BASE ℄ DETAIL

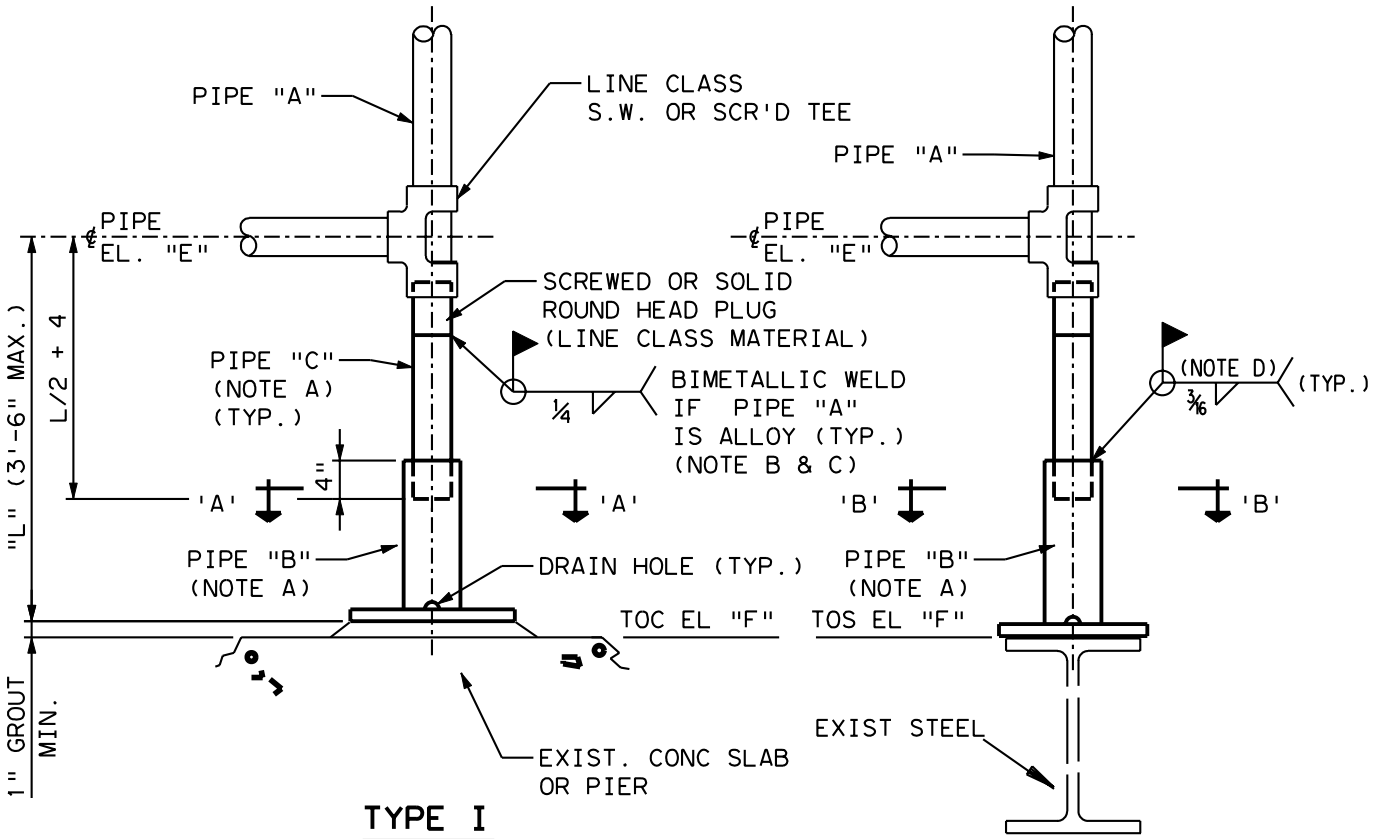
ADJUSTABLE SUPPORT SCHEDULE						
PIPE "A" STD WT MIN	PIPE "B" & "C" CS/ALLOY	BASE ℄ SIZE	"A" DIM	BOLT		"L" MAX LENGTH
				SIZE	HOLE	
2"	2"	6"x6"x⅜"	1¼"	½"	⅝"	3'-6"
3"	2"	7"x7"x½"	1¼"	½"	⅝"	3'-6"
4"	3"	8"x8"x½"	1¼"	½"	⅝"	3'-6"
6"	4"	10"x10"x½"	1¼"	½"	⅝"	4'-0"
8"	6"	10"x10"x½"	1¼"	½"	⅝"	4'-0"
10"	6"	10"x10"x½"	1¼"	½"	⅝"	4'-0"
12"	8"	12"x12"x½"	1¼"	½"	⅝"	4'-6"
14"	10"	14"x14"x½"	1¼"	½"	⅝"	4'-6"
16"	12"	16"x16"x¾"	1½"	⅝"	¾"	4'-6"
18"	14"	18"x18"x¾"	1½"	⅝"	¾"	4'-6"
20"	16"	18"x18"x¾"	1½"	⅝"	¾"	5'-0"
24"	18"	20"x20"x¾"	1½"	⅝"	¾"	5'-0"
30"	24"	26"x26"x¾"	1½"	⅝"	¾"	5'-0"

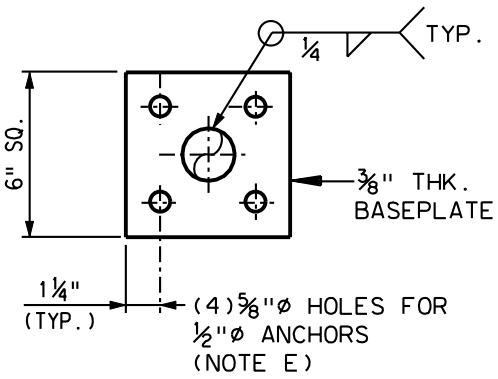
NOTES:

A. PIPE "C" MATERIAL SHALL BE THE SAME AS PIPE "A" AND STD WT.
B. PIPE "B" TO BE STD WT A53 GR. B OR EQUAL.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. ON SHOP FABRICATED PIPING, FABRICATOR TO SUPPLY SUPPORT WELDED TO SPOOL.
E. SEE SECTION 10.5 FOR ANCHOR TYPE. (EMBEDMENT E=MIN.)

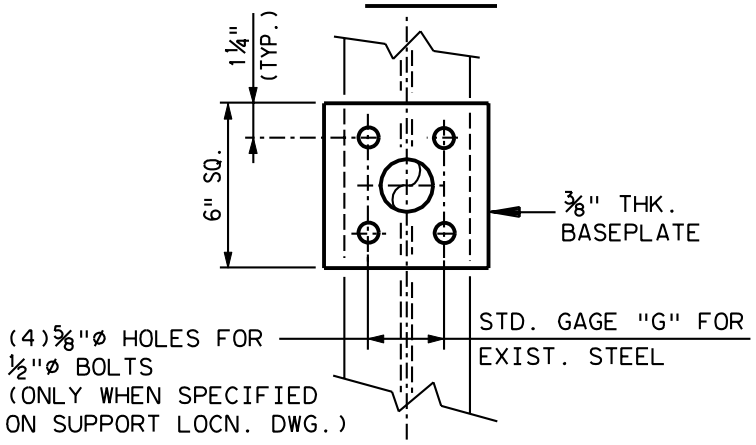
BS-4

PIPE/ELBOW NON-ADJUSTABLE SUPPORT/LINE SIZE
EITHER DIMENSION "L" OR ELEVATIONS "E" AND "F" ARE REQUIRED ON PIPING DRAWING





SECTION 'A-A'



SECTION 'B-B'

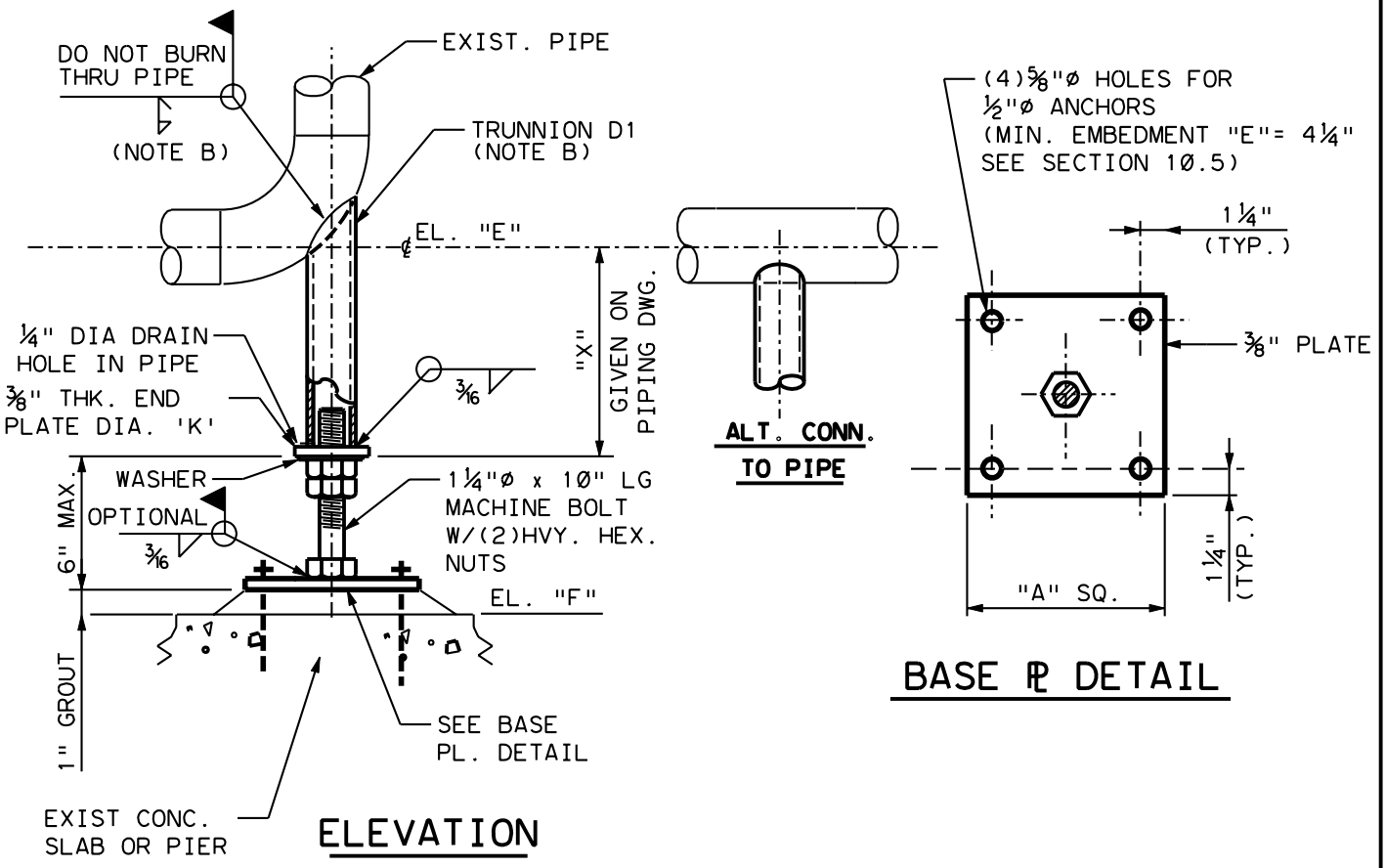
NOTES:

A. PIPE "B" & "C" TO BE CARBON STEEL.
B. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
C. DISSIMILAR WELD TO BE MADE IN SHOP FOR S.W. PIPING THAT IS SHOP FABRICATED.
D. FOR SHOP FABRICATED S.W. PIPING LOWER SECTION OF SUPPORT PIPE "B" WITH BASE ℙ TO BE FABRICATED AND SHIPPED TACK WELDED TO UPPER SECTION PIPE "C". ON THR'D PIPING SYSTEM SUPPORT TO BE BY FIELD.
E. FOR ANCHOR TYPE SEE SECTION 10.5, (EMBEDMENT E=MIN.)

BS-5

FOR S.W. AND THD. PIPING UP TO 2 " SIZE IN C.S. OR S.S., EITHER DIMENSION "L" OR ELEVATIONS "E" AND "F" ARE REQUIRED ON PIPING DRAWING

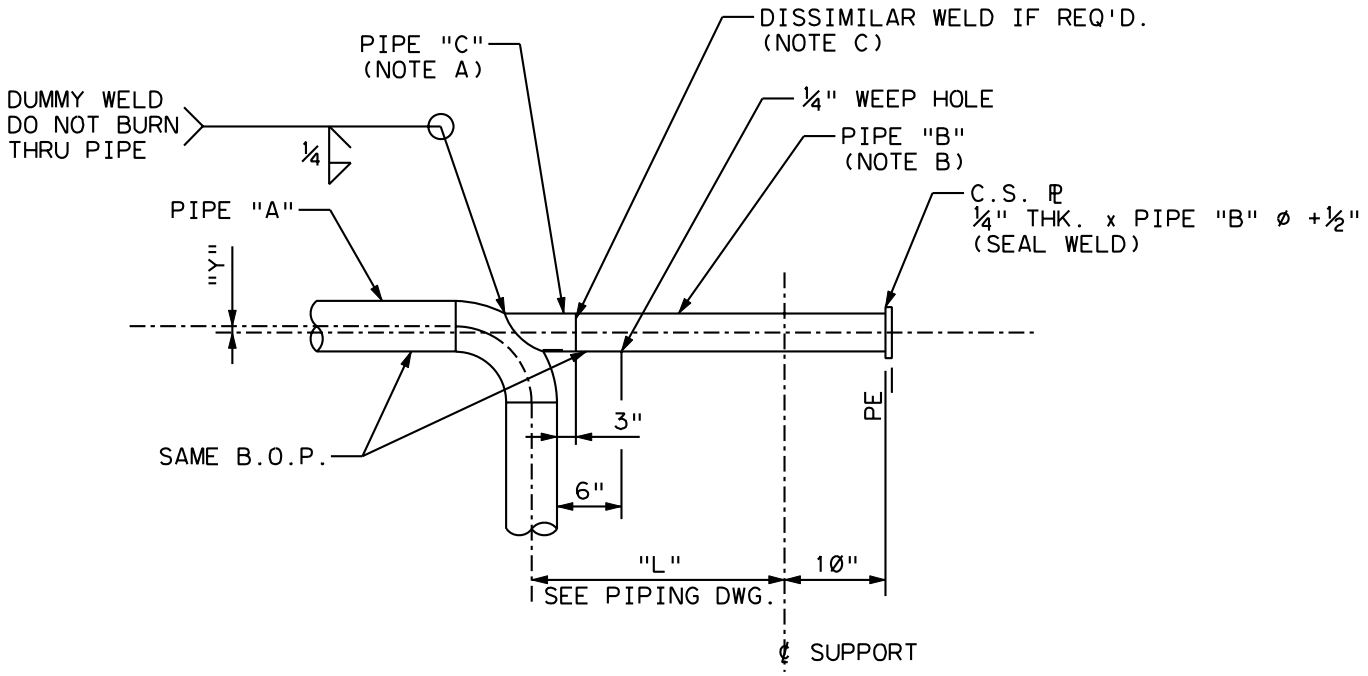
ADJUSTABLE SUPPORT SCHEDULE		
PIPE "A" SIZE	PIPE "B" SIZE	PIPE "C" SIZE
3/4"	1 1/4" SCH.80	3/4" SCH.80
1"	1 1/2" SCH.80	1" SCH.80
1 1/2" & 2"	2" SCH.40	1 1/2" SCH.80



EXIST. PIPE SIZE	TRUNNION D1	BASE PL "A" DIM.	DIA. 'K'
1½" & 2"	1½" XS	8"	2½"
3"	2" SCH.40	8"	3"
4"	2" SCH.40	10"	3"
6"	3" SCH.40	10"	4"
8" & 10"	4" SCH.40	12"	5"
12"	6" SCH.40	12"	7"

NOTE:

A. USE AROUND EQUIPMENT INLET/OUTLET CONNECTIONS.
B. ON SHOP FAB. PIPING THE TRUNNION D1 WILL BE SUPPLIED WELDED TO THE PIPE SPOOL.



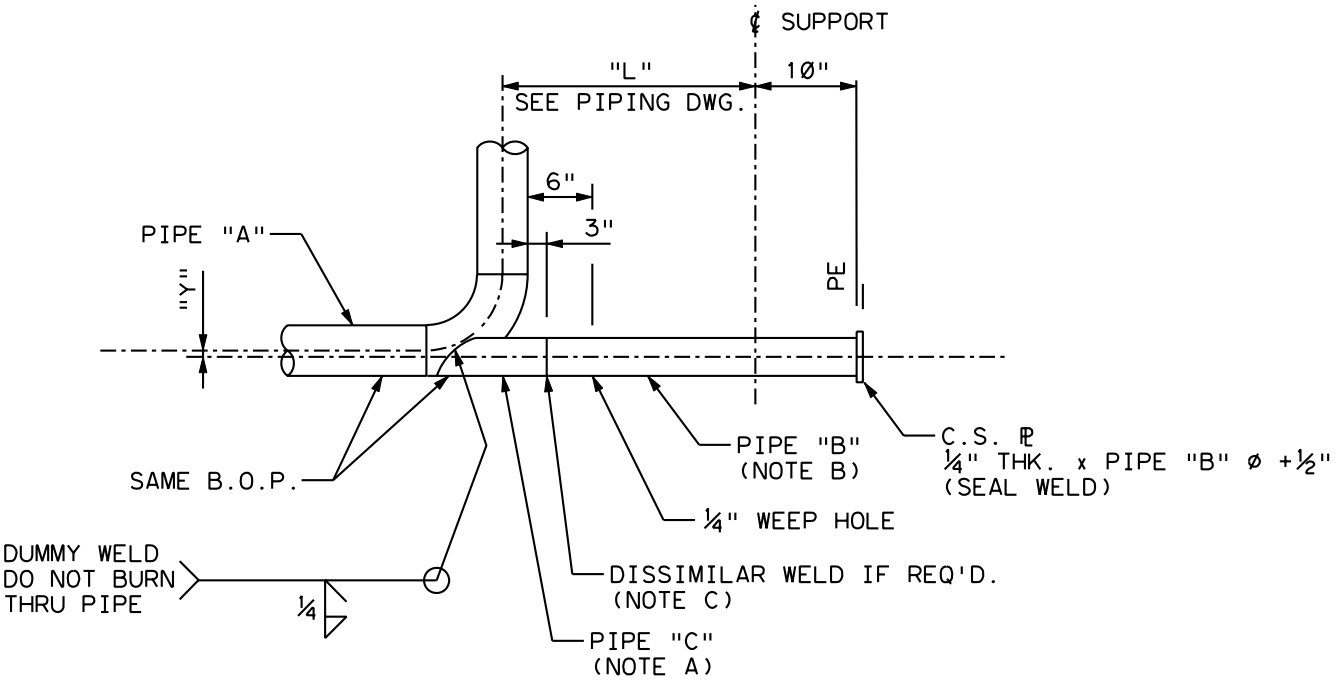
ELEVATION

S.S. DUMMY EXTENSION SCHEDULE			
PIPE "A"	"L" MAX LENGTH	MAX LOAD LBS	SPAN BASIS
2"	2'-0"	120	12'-6"
3"	2'-6"	175	13'-0"
4"	2'-6"	300	14'-0"
6"	3'-0"	500	16'-0"
8"	5'-0"	850	17'-0"
10"	4'-6"	1200	18'-0"
12"	4'-6"	2000	18'-0"
14"	4'-6"	2500	18'-0"
16"	4'-6"	3000	20'-0"
18"	4'-6"	4000	20'-0"
20"	4'-6"	6500	20'-0"

C.S. DUMMY EXTENSION SCHEDULE					
PIPE "A"	PIPE "B"&"C"	DIM "Y"	"L" MAX LENGTH	MAX LOAD LBS	SPAN BASIS
2"	1½"	¼"	2'-6"	120	16'-0"
3"	2"	9/16"	3'-0"	275	21'-0"
4"	3"	½"	3'-6"	475	22'-0"
6"	4"	1 1/16"	4'-6"	650	24'-0"
8"	6"	1"	5'-0"	1000	30'-0"
10"	8"	1 1/16"	5'-6"	1350	34'-0"
12"	8"	2 1/16"	5'-6"	1600	36'-0"
14"	10"	1 5/8"	5'-6"	2000	38'-0"
16"	12"	1 5/8"	5'-6"	3000	38'-0"
18"	14"	2"	5'-6"	3250	38'-0"
20"	14"	3"	5'-6"	4000	38'-0"
24"	14"	5"	6'-0"	4500	38'-0"

NOTES:

A. PIPE "C" MATERIAL AND SCHEDULE SHALL BE THE SAME AS PIPE "A".
B. PIPE "B" TO BE STD WT C.S.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. MAXIMUM LENGTH AND LOADS MAY BE INCREASED USING LINE SIZE DUMMY EXTENSION WITH PIPING SUPPORT ENGINEER'S APPROVAL.
E. ON SHOP FABRICATED PIPING DUMMY EXTENSION TO BE INSTALLED IN SHOP.
F. PIPE SPECS USING SCH. 10S PIPE REQUIRES SIZE ON SIZE DUMMY LEG.



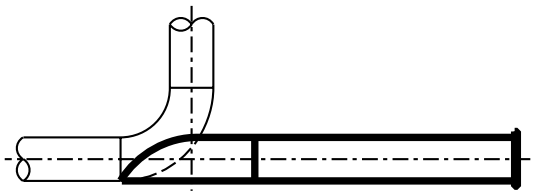
ELEVATION

S.S. DUMMY EXTENSION SCHEDULE			
PIPE "A"	"L" MAX LENGTH	MAX LOAD LBS	SPAN BASIS
2"	2'-0"	120	12'-6"
3"	2'-6"	175	13'-0"
4"	2'-6"	300	14'-0"
6"	3'-0"	500	16'-0"
8"	5'-0"	850	17'-0"
10"	5'-0"	1250	18'-0"
12"	4'-6"	2000	18'-0"
14"	4'-6"	2500	18'-0"
16"	4'-6"	3250	20'-0"
18"	4'-6"	4000	20'-0"
20"	4'-6"	6500	20'-0"

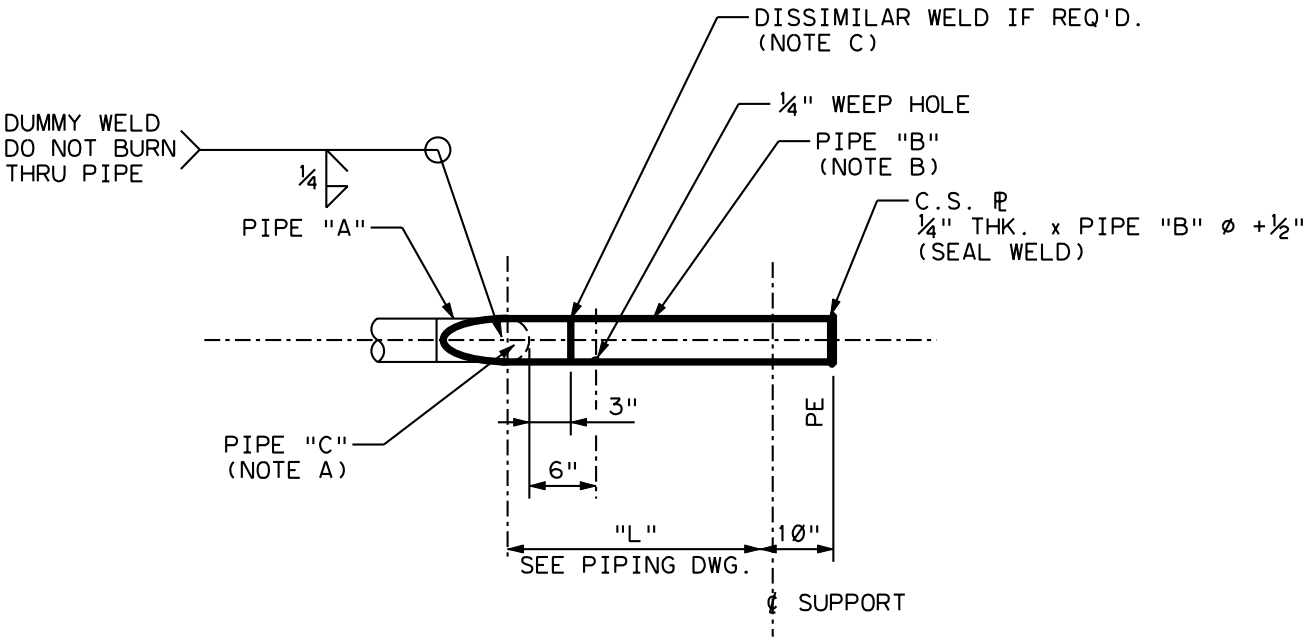
C.S. DUMMY EXTENSION SCHEDULE					
PIPE "A"	PIPE "B"&"C"	DIM "Y"	"L" MAX LENGTH	MAX LOAD LBS	SPAN BASIS
2"	1½"	¼"	2'-6"	120	16'-0"
3"	2"	9/16"	3'-0"	275	21'-0"
4"	3"	½"	3'-6"	475	22'-0"
6"	4"	1 1/16"	4'-6"	650	24'-0"
8"	6"	1"	5'-0"	1000	30'-0"
10"	8"	1 1/16"	5'-6"	1350	34'-0"
12"	8"	2 1/16"	5'-6"	1600	36'-0"
14"	10"	1 5/8"	5'-6"	2000	38'-0"
16"	12"	1 5/8"	5'-6"	3000	38'-0"
18"	14"	2"	5'-6"	3250	38'-0"
20"	14"	3"	5'-6"	4000	38'-0"
24"	14"	5"	6'-0"	4500	38'-0"

NOTES:

A. PIPE "C" MATERIAL AND SCHEDULE SHALL BE THE SAME AS PIPE "A".
B. PIPE "B" TO BE STD WT C.S.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. MAXIMUM LENGTH AND LOADS MAY BE INCREASED USING LINE SIZE DUMMY EXTENSION WITH PIPING SUPPORT ENGINEER'S APPROVAL.
E. ON SHOP FABRICATED PIPING DUMMY EXTENSION TO BE INSTALLED IN SHOP.
F. PIPE SPECS USING SCH. 10S PIPE REQUIRES SIZE ON SIZE DUMMY LEG.



PLAN



ELEVATION

S.S. DUMMY EXTENSION SCHEDULE				
PIPE "A"	PIPE "B"&"C"	"L" MAX LENGTH	MAX LOAD LBS	SPAN BASIS
2"	2"	3'-0"	120	16'-0"
3"	3"	4'-0"	200	20'-0"
4"	4"	6'-0"	350	20'-0"
6"	6"	6'-0"	1000	24'-0"
8"	8"	6'-0"	2000	26'-0"
10"	10"	6'-0"	3000	28'-0"
12"	12"	6'-0"	4500	32'-0"
14"	14"	6'-0"	5000	38'-0"
16"	16"	6'-0"	6500	38'-0"
18"	18"	6'-0"	7500	38'-0"
20"	20"	6'-0"	8500	40'-0"

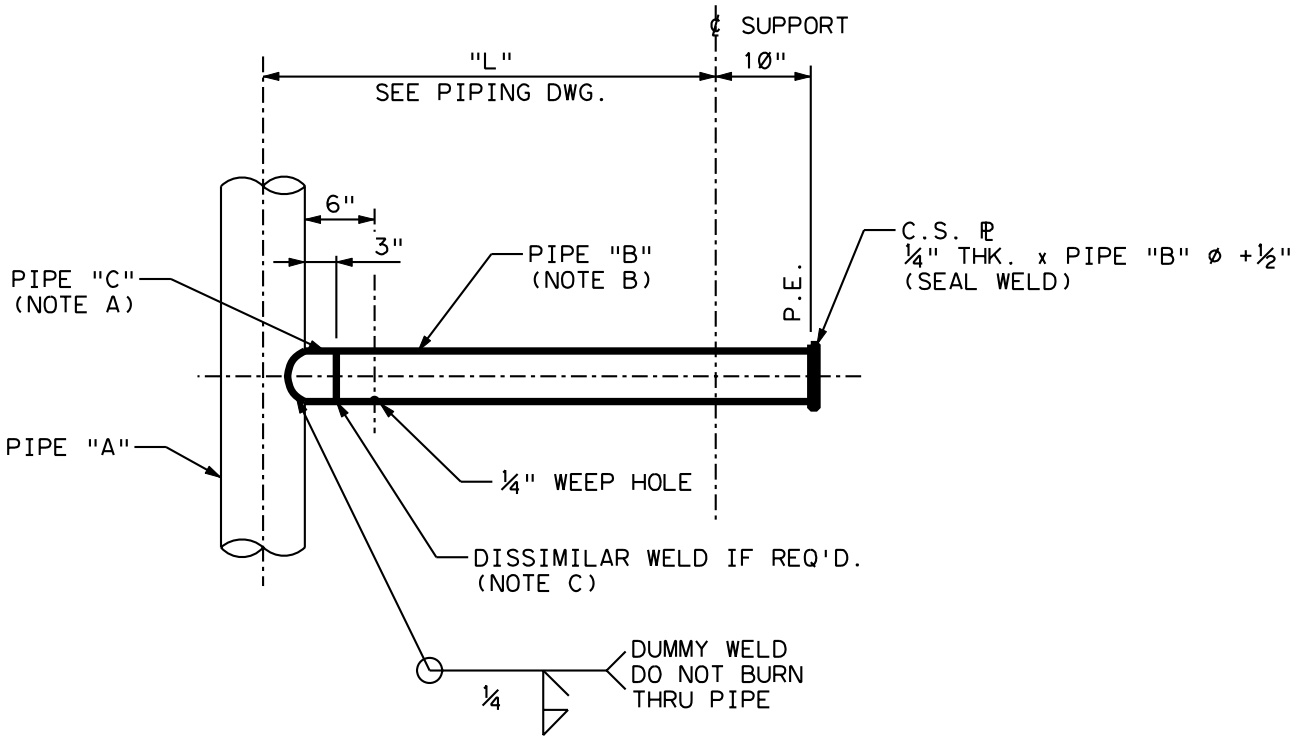
C.S. DUMMY EXTENSION SCHEDULE				
PIPE "A"	PIPE "B"&"C"	"L" MAX LENGTH	MAX LOAD LBS	SPAN BASIS
2"	2"	4'-0"	120	17'-0'
3"	3"	5'-0"	300	21'-0'
4"	4"	6'-0"	500	24'-0'
6"	6"	6'-0"	2000	28'-0'
8"	8"	6'-0"	5000	33'-0'
10"	10"	6'-0"	7500	37'-0'
12"	12"	6'-0"	10000	39'-0'
14"	14"	6'-0"	15000	40'-0"
16"	16"	6'-0"	17000	40'-0"
18"	18"	6'-0"	19000	40'-0"
20"	20"	6'-0"	22500	40'-0"
24"	24"	6'-0"	25000	40'-0"

NOTES:

A. PIPE "C" MATERIAL AND SCHEDULE SHALL BE THE SAME AS PIPE "A".
B. PIPE "B" TO BE STD WT C.S.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. MAXIMUM LENGTH AND LOADS MAY BE INCREASED WITH PIPING SUPPORT ENGINEER'S APPROVAL.
E. ON SHOP FABRICATED PIPING DUMMY EXTENSION TO BE INSTALLED IN SHOP.

DL-3

ELBOW/DUMMY SUPPORT (FLAT TURN)



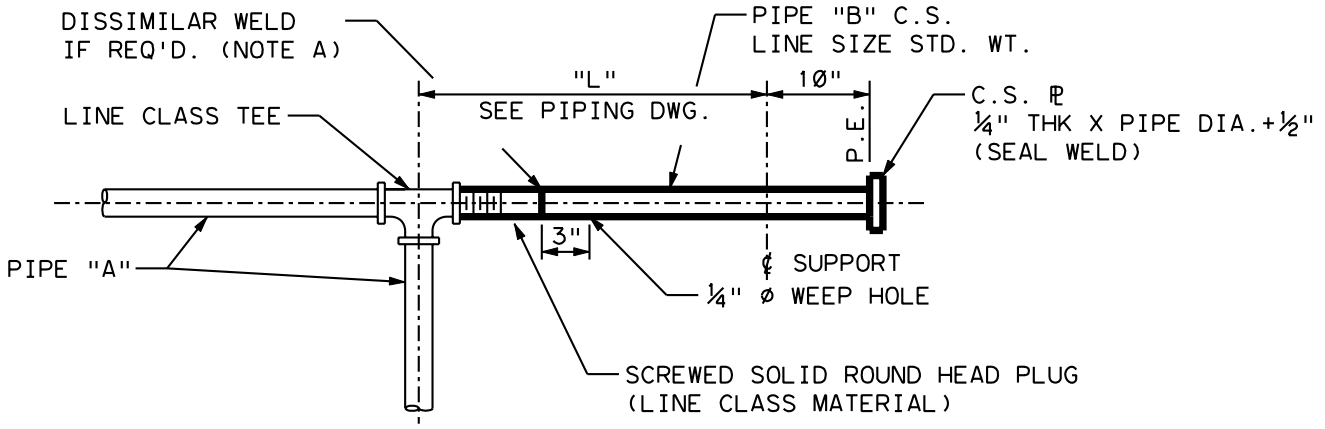
ELEVATION

S.S. DUMMY EXTENSION SCHEDULE			
PIPE "A"	PIPE "B"&"C"	"L" MAX LENGTH	MAX LOAD LBS
1"	1"	1'-6"	90
1½"	1½"	1'-9"	175
2"	1½"	1'-9"	125
3"	2"	2'-0"	200
4"	3"	2'-0"	600
6"	4"	2'-0"	1000
8"	6"	2'-6"	2000
10"	8"	2'-6"	4000
12"	8"	3'-0"	6000
14"	10"	3'-6"	7500
16"	12"	3'-6"	10000
18"	12"	3'-9"	12000
20"	14"	4'-0"	14500

C.S. DUMMY EXTENSION SCHEDULE			
PIPE "A"	PIPE "B"&"C"	"L" MAX LENGTH	MAX LOAD LBS
1"	1"	1'-9"	90
1½"	1½"	2'-0"	200
2"	1½"	2'-0"	200
3"	2"	2'-0"	200
4"	3"	2'-6"	700
6"	4"	3'-0"	1500
8"	6"	3'-0"	4200
10"	8"	3'-0"	7500
12"	8"	3'-6"	7000
14"	10"	3'-9"	10000
16"	12"	4'-0"	14000
18"	12"	4'-0"	14000
20"	14"	4'-0"	18000
24"	14"	4'-0"	20000

NOTES:

A. PIPE "C" MATERIAL AND SCHEDULE SHALL BE THE SAME AS PIPE "A".
B. PIPE "B" TO BE STD WT C.S.
C. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
D. MAXIMUM LENGTH AND LOADS MAY BE INCREASED WITH PIPING SUPPORT ENGINEER'S APPROVAL.
E. ON SHOP FABRICATED PIPING DUMMY EXTENSION TO BE INSTALLED IN SHOP.



NOTES:

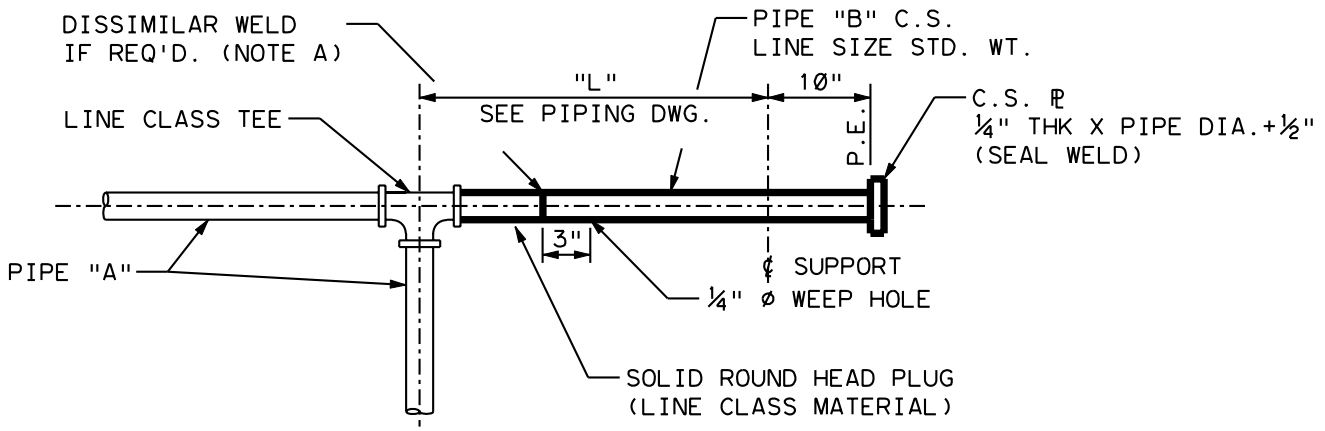
ELEVATION

A. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
B. MAXIMUM LENGTH AND LOADS MAY BE INCREASED WITH PIPING SUPPORT ENGINEER'S APPROVAL.

DUMMY EXTENSION SCHEDULE		
PIPE "A" SIZE	"L" MAX. LENGTH	MAX. LOAD LBS.
¾"	3'-Ø"	35
1"	3'-Ø"	45
1½"	3'-6"	100
2"	4'-Ø"	150

DL-5

DUMMY SUPPORT
LINES 2" AND SMALLER SCREWED PIPE



NOTES:

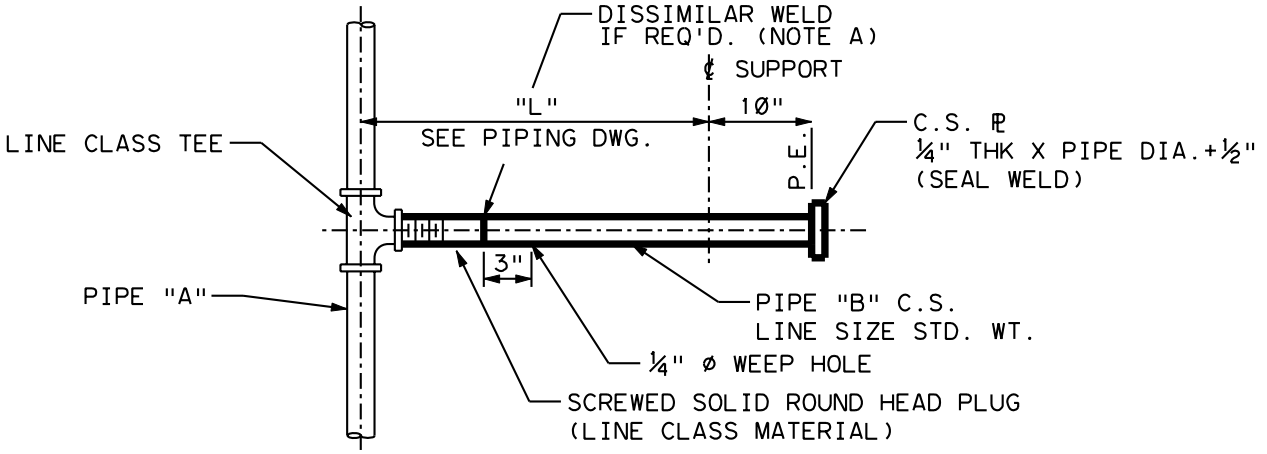
ELEVATION

A. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
B. MAXIMUM LENGTH AND LOADS MAY BE INCREASED WITH PIPING SUPPORT ENGINEER'S APPROVAL.
C. ON SHOP FABRICATED PIPING DUMMY EXTENSION TO BE INSTALLED BY SHOP.

DUMMY EXTENSION SCHEDULE		
PIPE "A" SIZE	"L" MAX. LENGTH	MAX. LOAD LBS.
¾"	3'-Ø"	35
1"	3'-Ø"	45
1½"	3'-6"	100
2"	4'-Ø"	150

DL-6

DUMMY SUPPORT
LINES 2" AND SMALLER SOCKET WELD PIPE



NOTES:

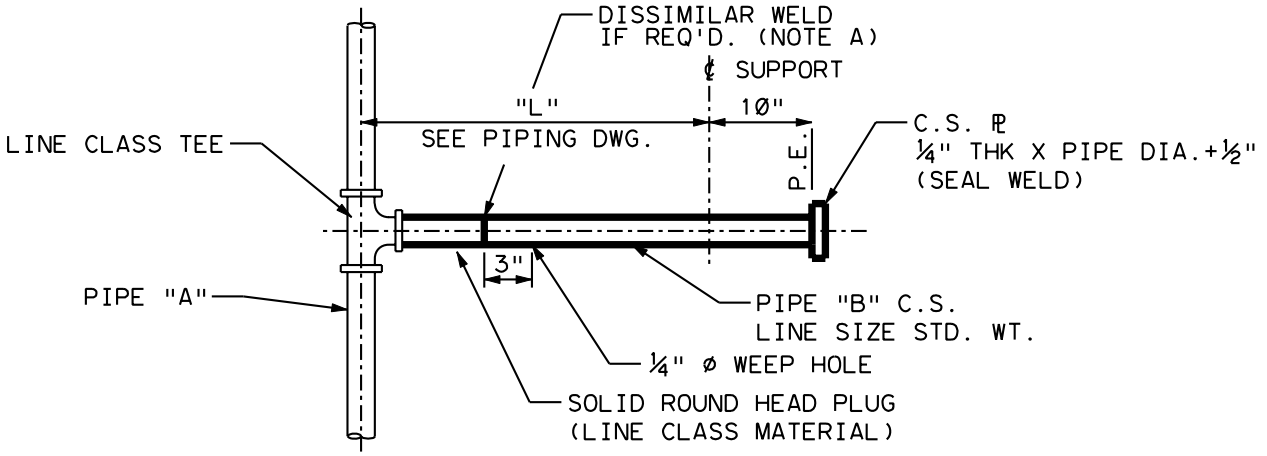
ELEVATION

A. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
B. MAXIMUM LENGTH AND LOADS MAY BE INCREASED WITH PIPING SUPPORT ENGINEER'S APPROVAL.

DUMMY EXTENSION SCHEDULE		
PIPE "A" SIZE	"L" MAX. LENGTH	MAX. LOAD LBS.
¾"	3'-Ø"	25
1"	3'-Ø"	35
1½"	3'-6"	5Ø
2"	4'-Ø"	75

DL-7

DUMMY SUPPORT
LINES 2" AND SMALLER SCREWED PIPE



NOTES:

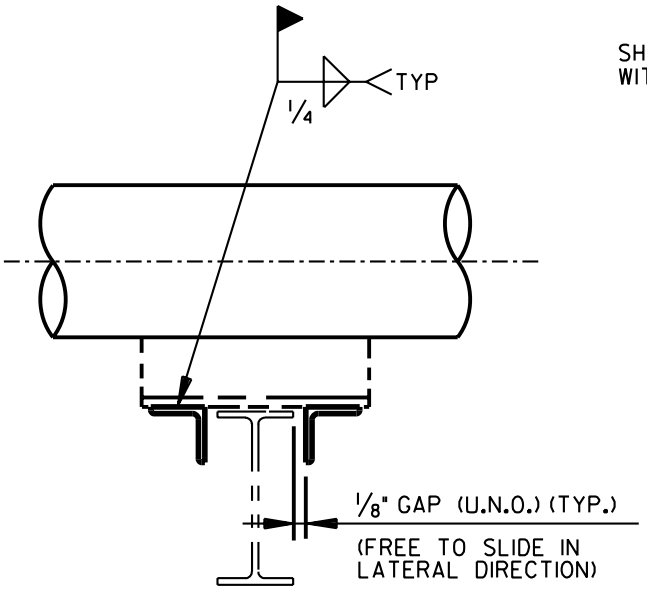
ELEVATION

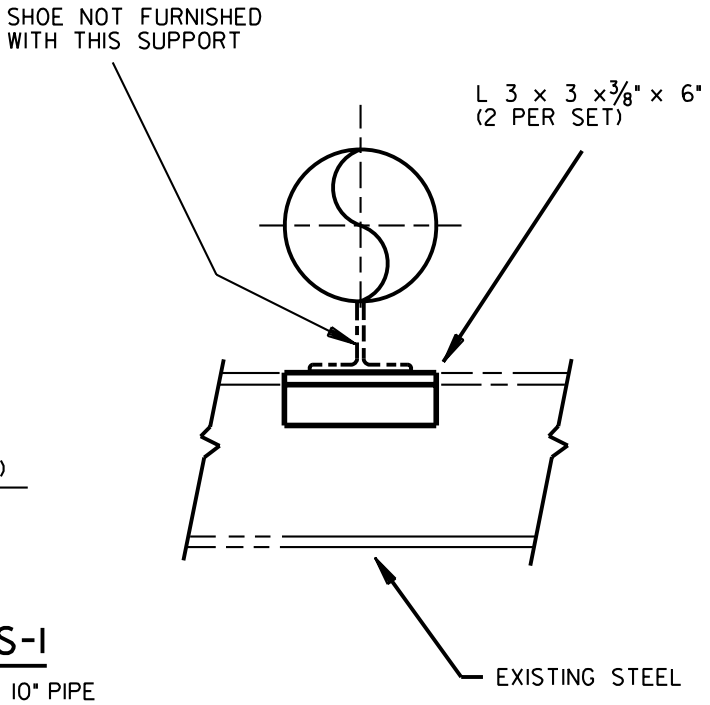
A. DISSIMILAR WELD TO BE MADE WITH PIPE "A" CLASS WELD ROD AND BE PER ASME B31.3.
B. MAXIMUM LENGTH AND LOADS MAY BE INCREASED WITH PIPING SUPPORT ENGINEER'S APPROVAL.
C. ON SHOP FABRICATED PIPING DUMMY EXTENSION TO BE INSTALLED BY SHOP.

DUMMY EXTENSION SCHEDULE		
PIPE "A" SIZE	"L" MAX. LENGTH	MAX. LOAD LBS.
¾"	3'-Ø"	25
1"	3'-Ø"	35
1½"	3'-6"	5Ø
2"	4'-Ø"	75

DL-8

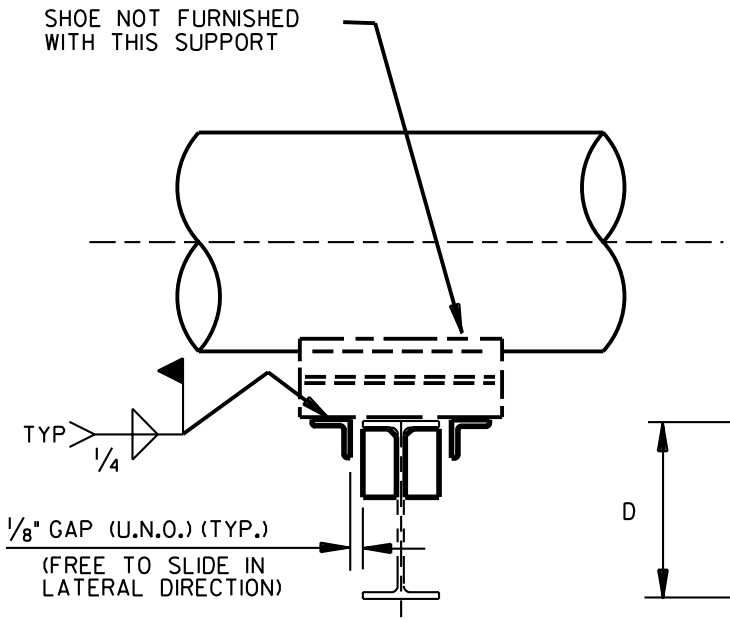
DUMMY SUPPORT
LINES 2" AND SMALLER SOCKET WELD PIPE

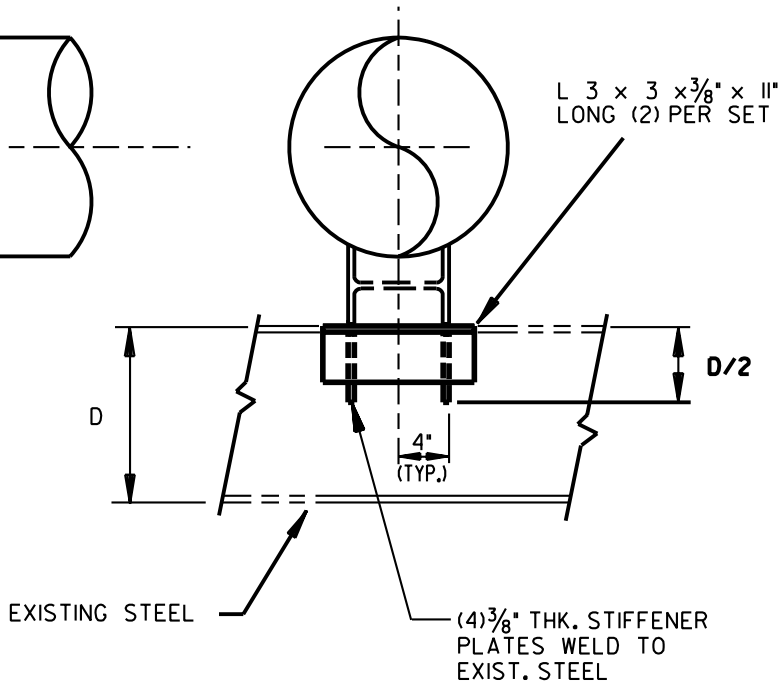




DS-I

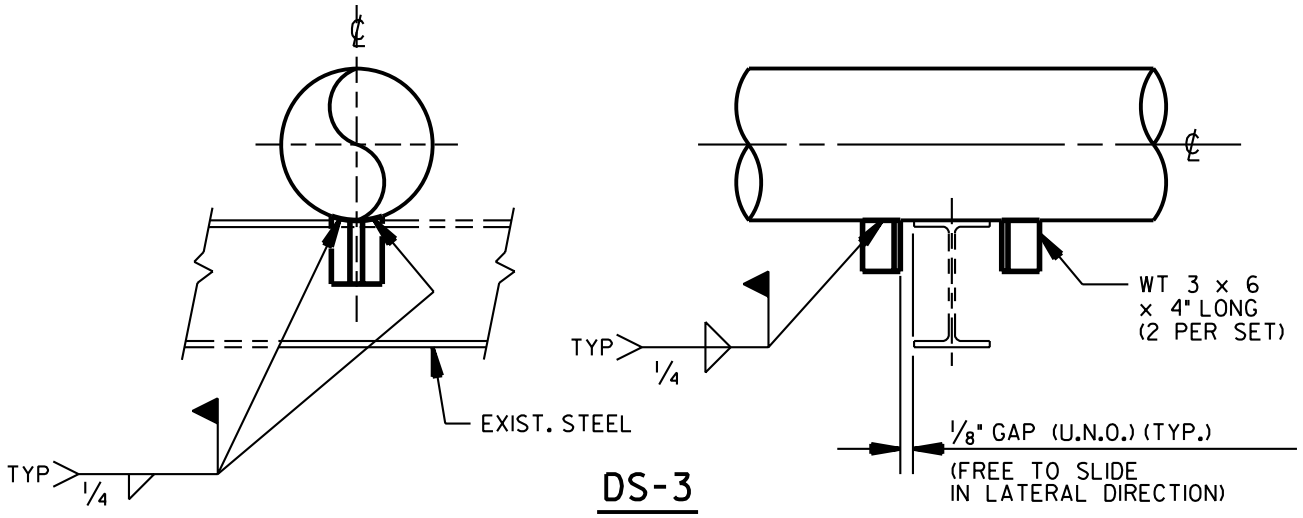
UP TO 10" PIPE





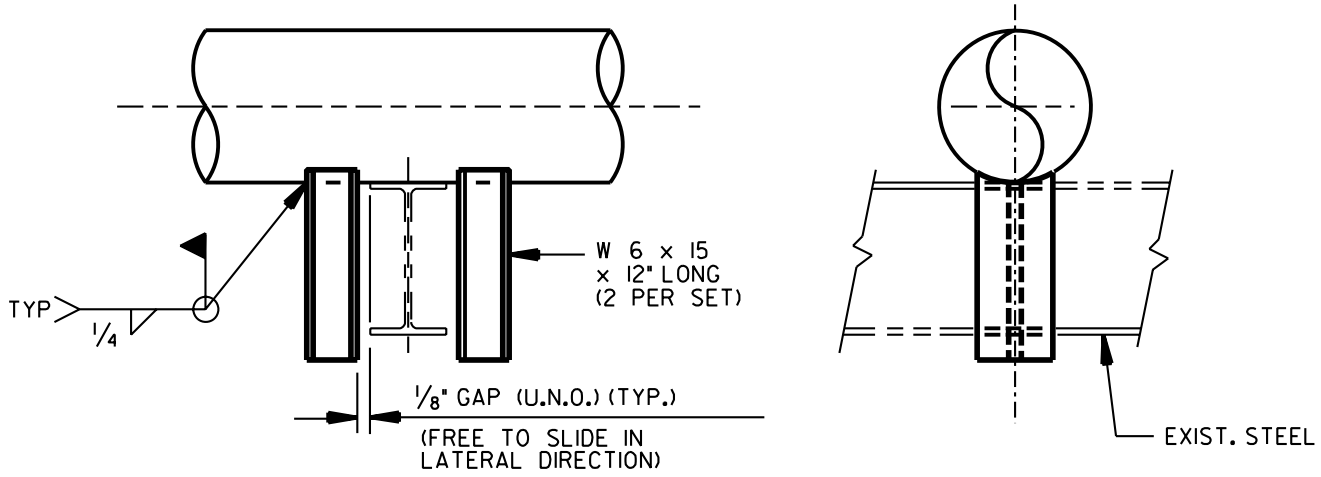
DS-2

(12" TO 16" PIPE)



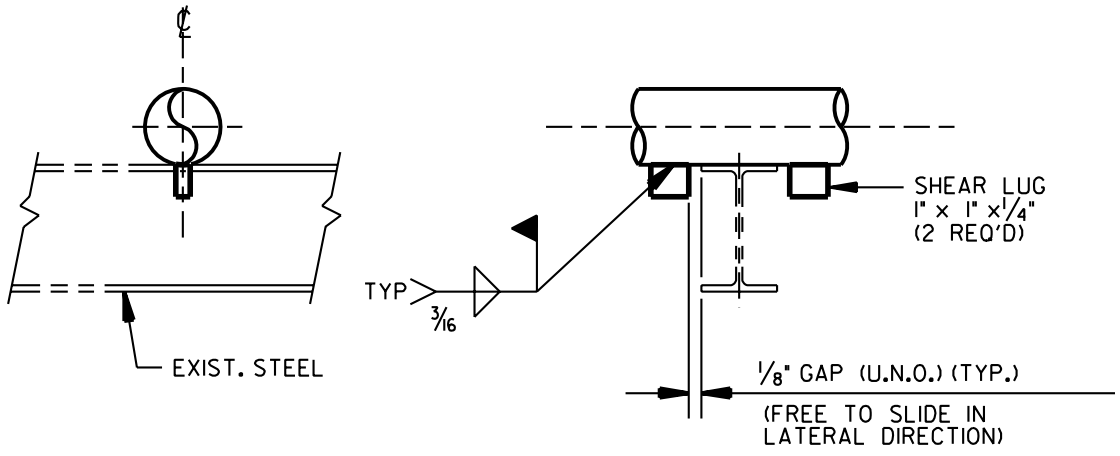
DS-3

(2" TO 10" C.S. PIPE)



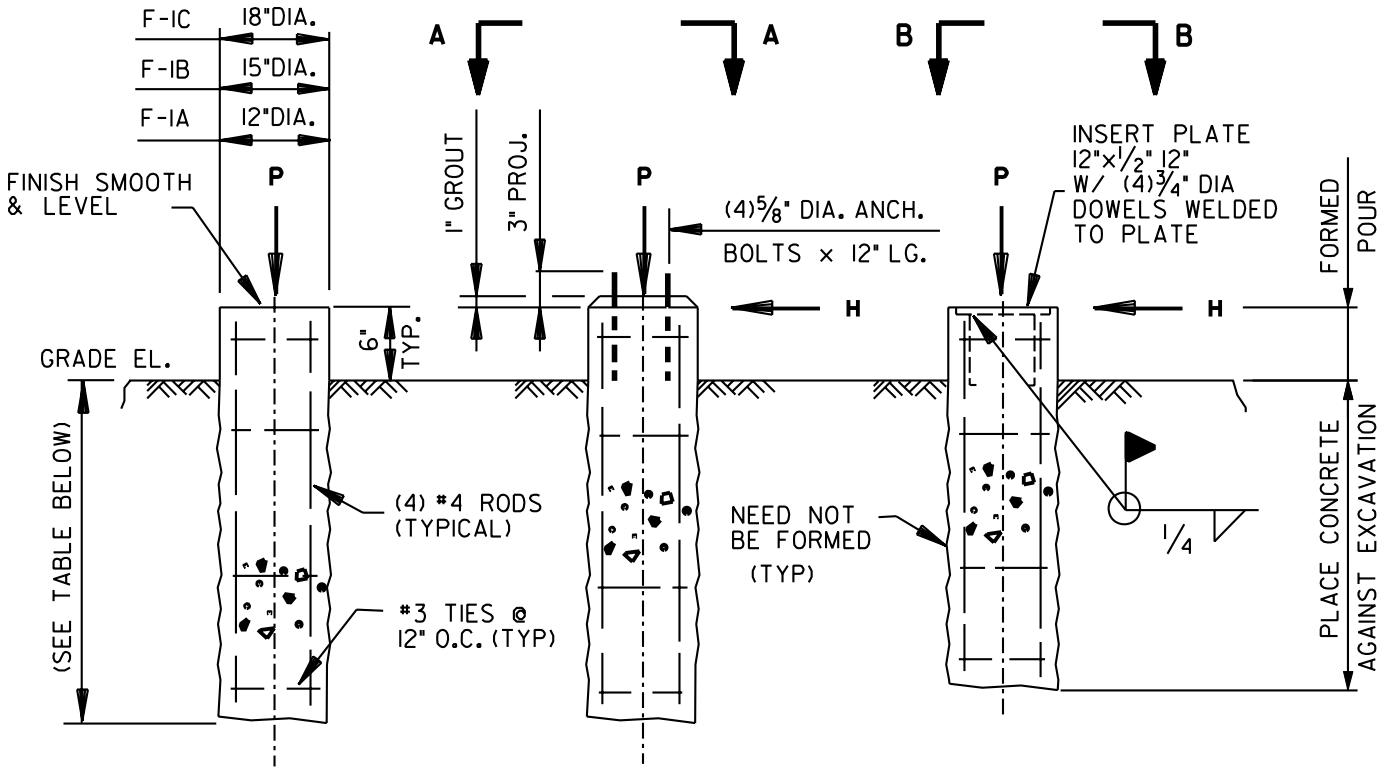
DS-4

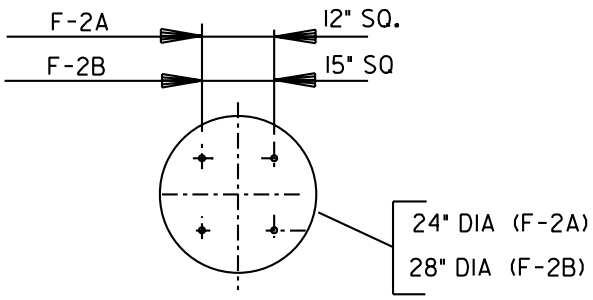
(12" TO 24" C.S. PIPE)



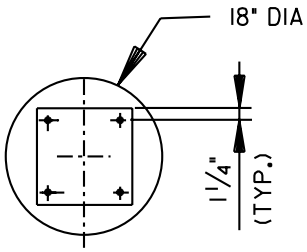
DS-5

1½" & SMALLER C.S. PIPE





SECTION A-A (F-2)



SECTION B-B (F-3)

DEPTH BELOW GRADE *	P (KIPS)			H (KIPS)	
	F-IA	F-IB F-2A F3	F-IC F-2B	F-2A F-3	F-2B
2'-0"	1.6	2.5	3.8	0.3	0.4
3'-0"	1.5	2.3	3.4	0.6	0.8
4"-0"	1.3	2.1	3.0	0.8	1.1

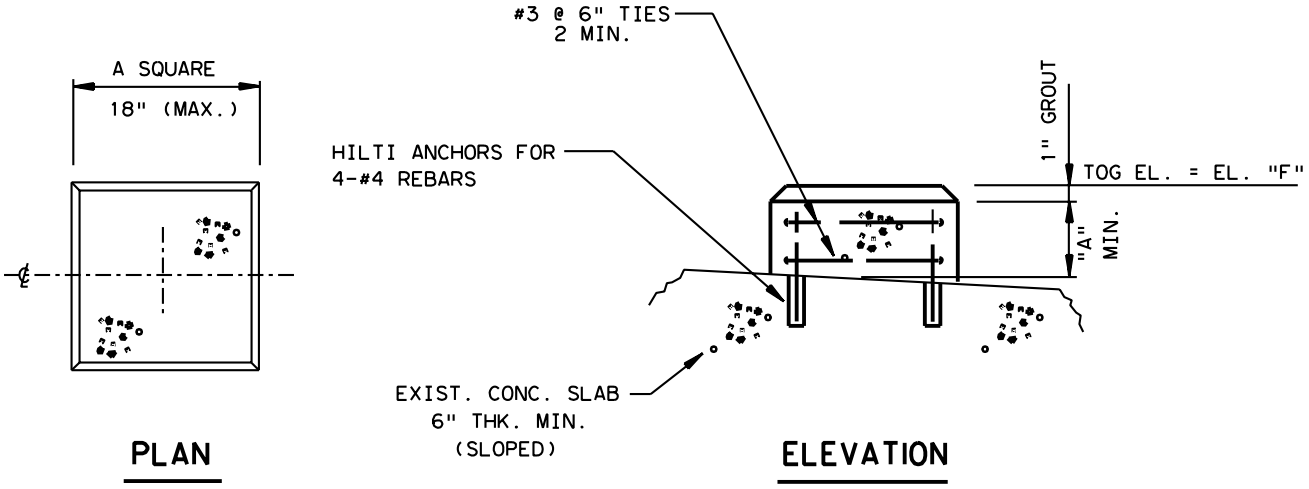
* DEPTH TO FROST LINE OR AS NOTED. WHICHEVER IS LARGER

NOTES

1. VALUES GIVEN IN TABLE ARE BASED ON 2000 lbs./SQ. FT SOIL BEARING CAPACITY FOR VERTICAL LOAD AND 500 lbs./SQ. FT PASSIVE PRESSURE FOR HORIZONTAL LOAD.
2. THIS STD. SHALL BE USED WHERE THERE IS NO CONCRETE PAVING
3. THIS STD. SHALL BE USED ONLY AFTER REVIEW BY CIVIL ENGINEER.

F1, 2, & 3

(POSTHOLE TYPE FOUNDATION)



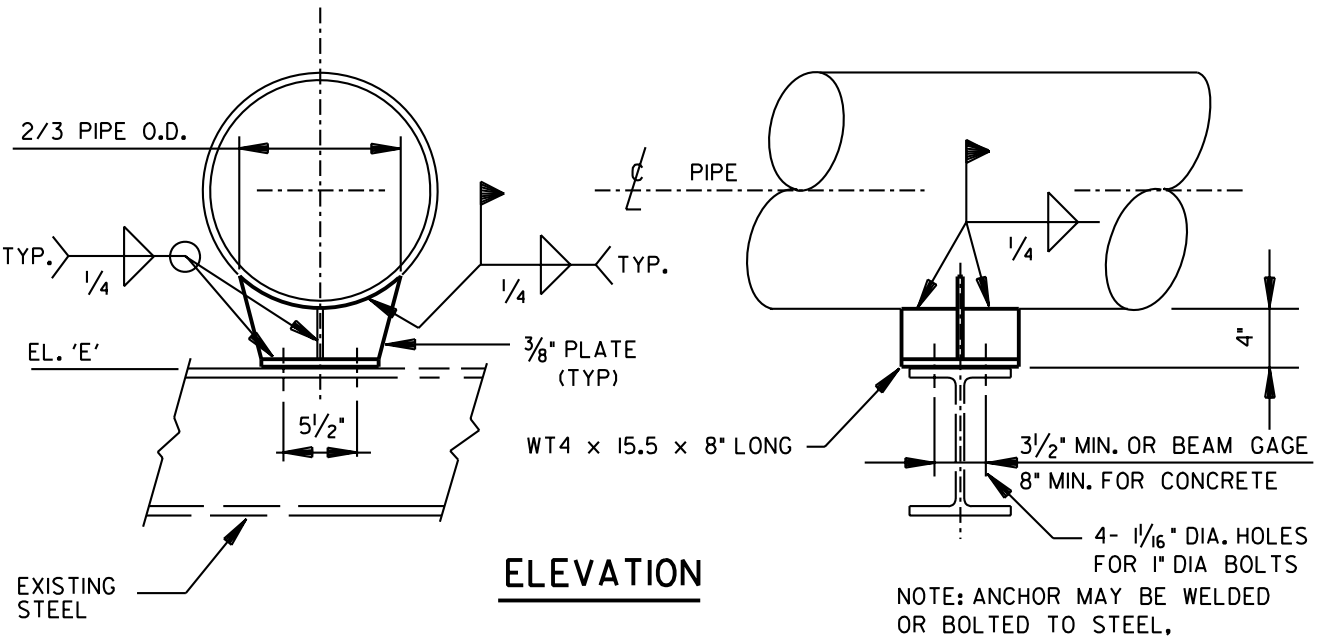
PLAN

ELEVATION

NOTE

USE THIS STD. WHERE BASE-TYPE PIPE SUPPORTS ARE SPECIFIED ON A SLOPED SLAB.

F-4



ELEVATION

PA-I

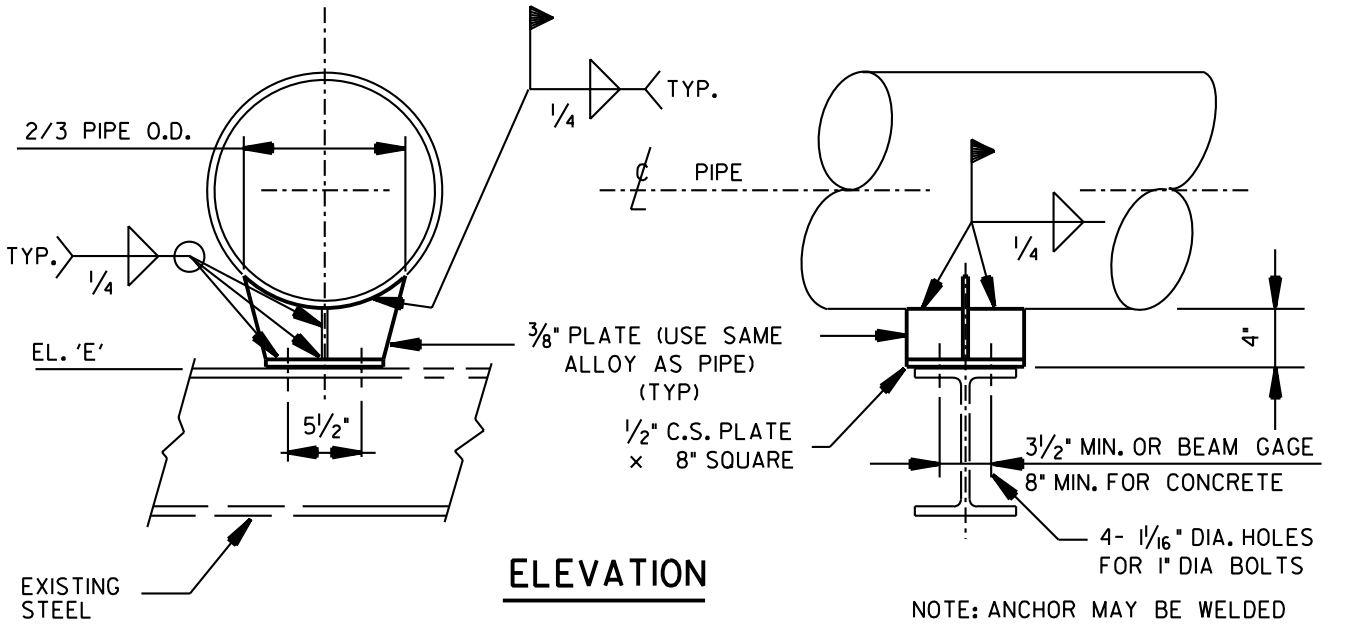
NOTE: ANCHOR MAY BE WELDED
OR BOLTED TO STEEL,
OR BOLTED TO CONCRETE
(ANCHOR BOLTS PER T.S. 32-210-04)

PIPE ANCHOR FOR C.S. STEEL PIPE 10" TO 24" SIZE

MAXIMUM AXIAL LOAD IS 15,000 LBS WHEN ANCHORED TO STEEL
AND 5,000 LBS WHEN ANCHORED TO CONCRETE.

WHERE FORCE IS GREATER THAN SHOWN ABOVE,
A SPECIAL ANCHOR SHALL BE DESIGNED.

CAUTION:
SEE SECTION 10.2



ELEVATION

PA-2

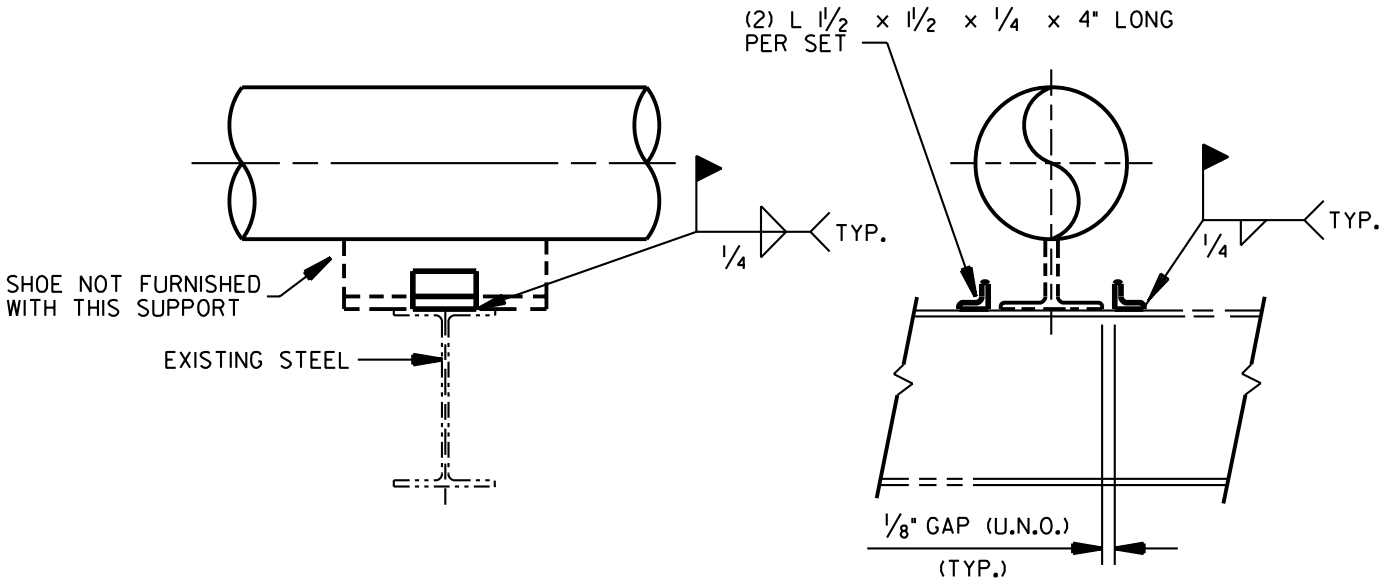
NOTE: ANCHOR MAY BE WELDED OR BOLTED TO STEEL, OR BOLTED TO CONCRETE (ANCHOR BOLTS PER T.S. 32-210-04)

PIPE ANCHOR FOR ALLOY PIPE 10" TO 24" SIZE

MAXIMUM AXIAL LOAD IS 15,000 LBS WHEN ANCHORED TO STEEL AND 5,000 LBS WHEN ANCHORED TO CONCRETE.

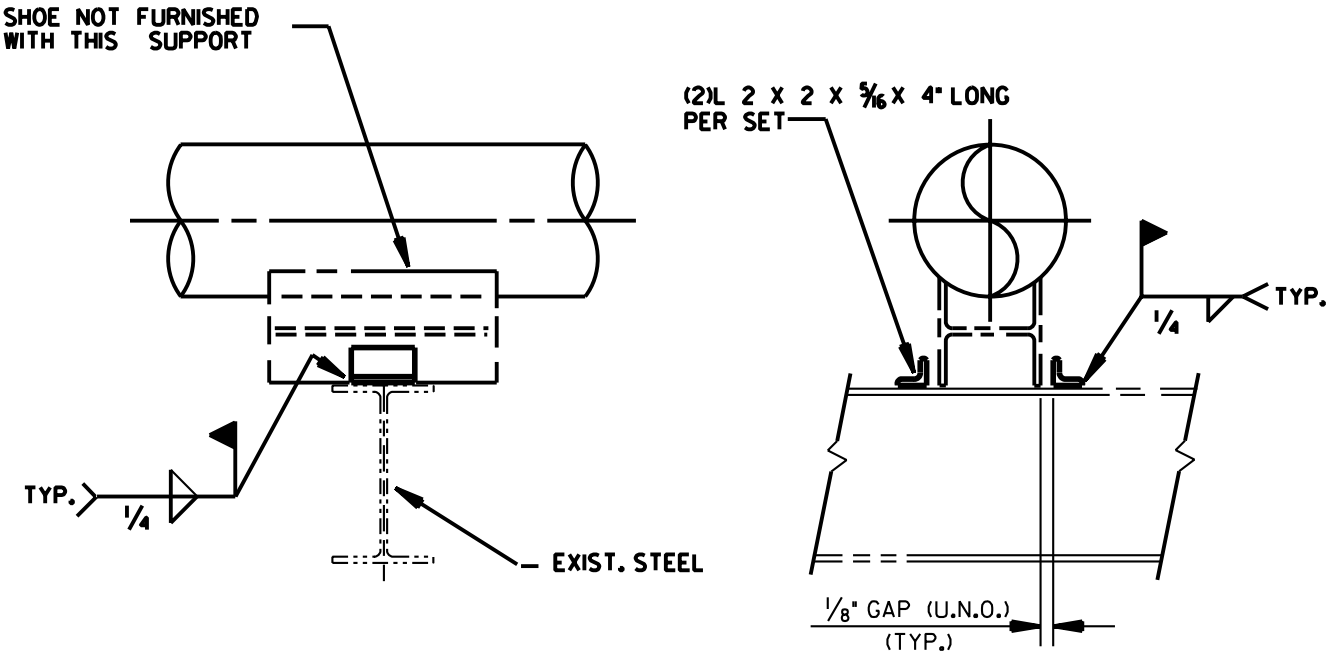
WHERE FORCE IS GREATER THAN SHOWN ABOVE, A SPECIAL ANCHOR SHALL BE DESIGNED.

CAUTION:
SEE SECTION 10.2



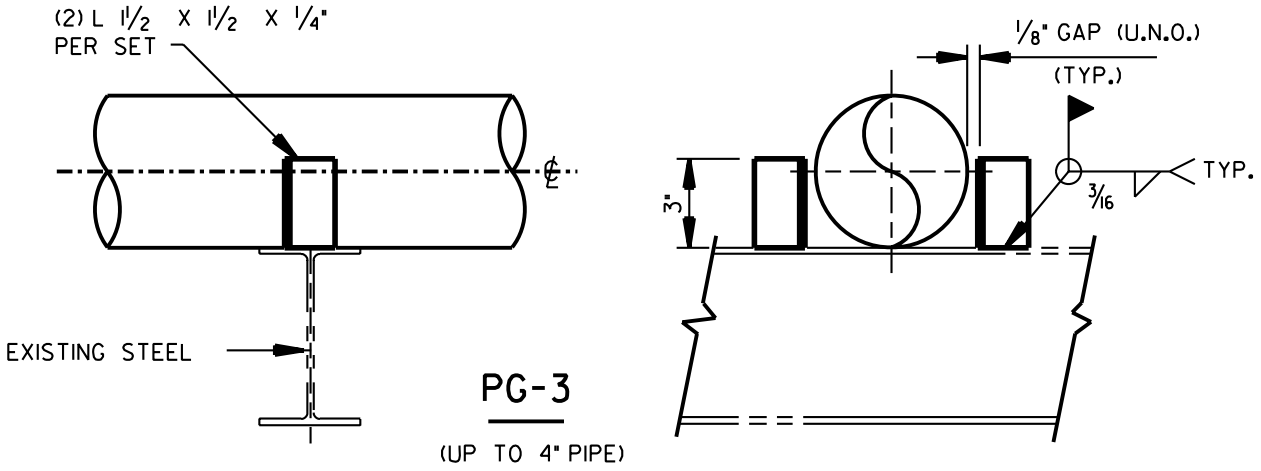
PG-1

(UP TO 10" PIPE)



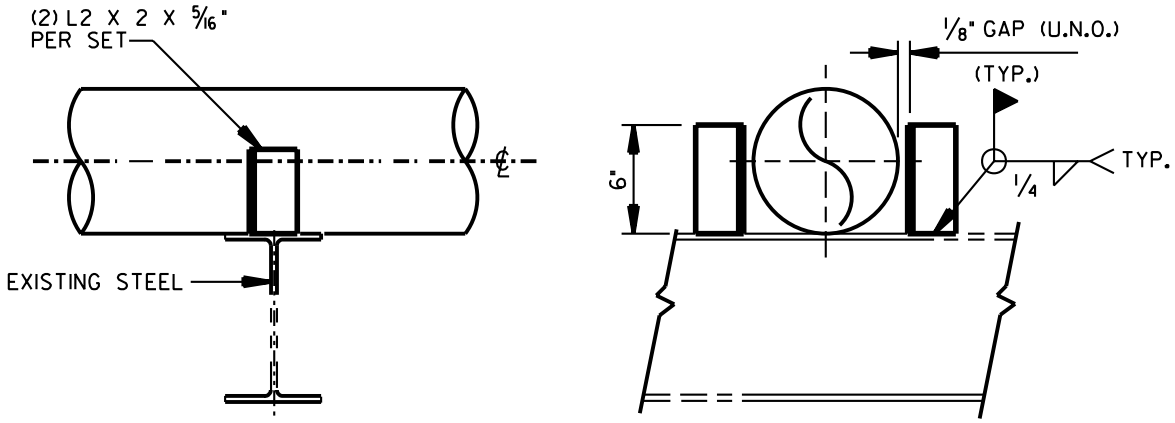
PG-2

(12" TO 24" PIPE)



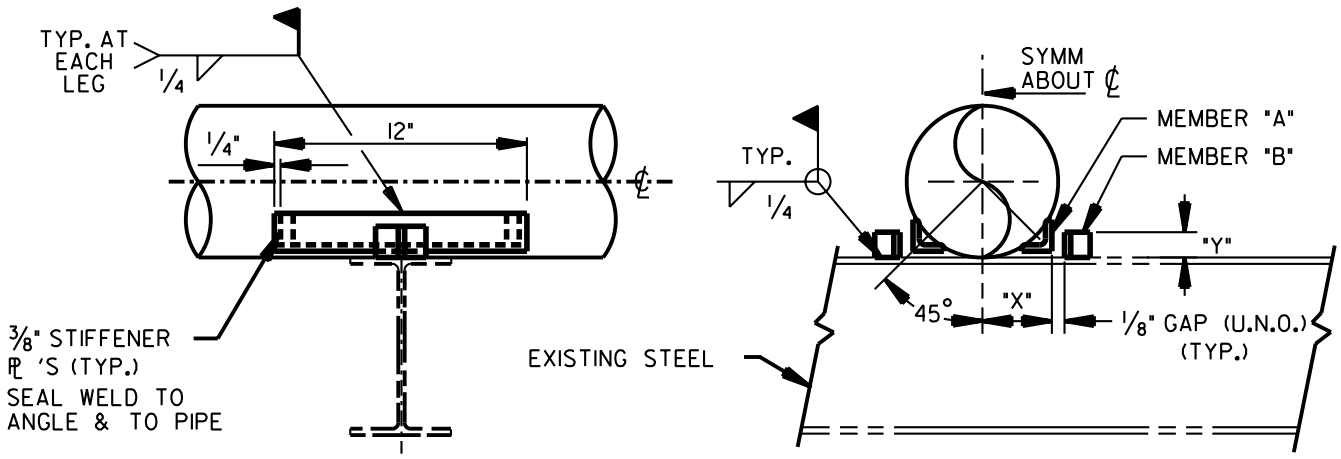
PG-3

(UP TO 4" PIPE)



PG-4

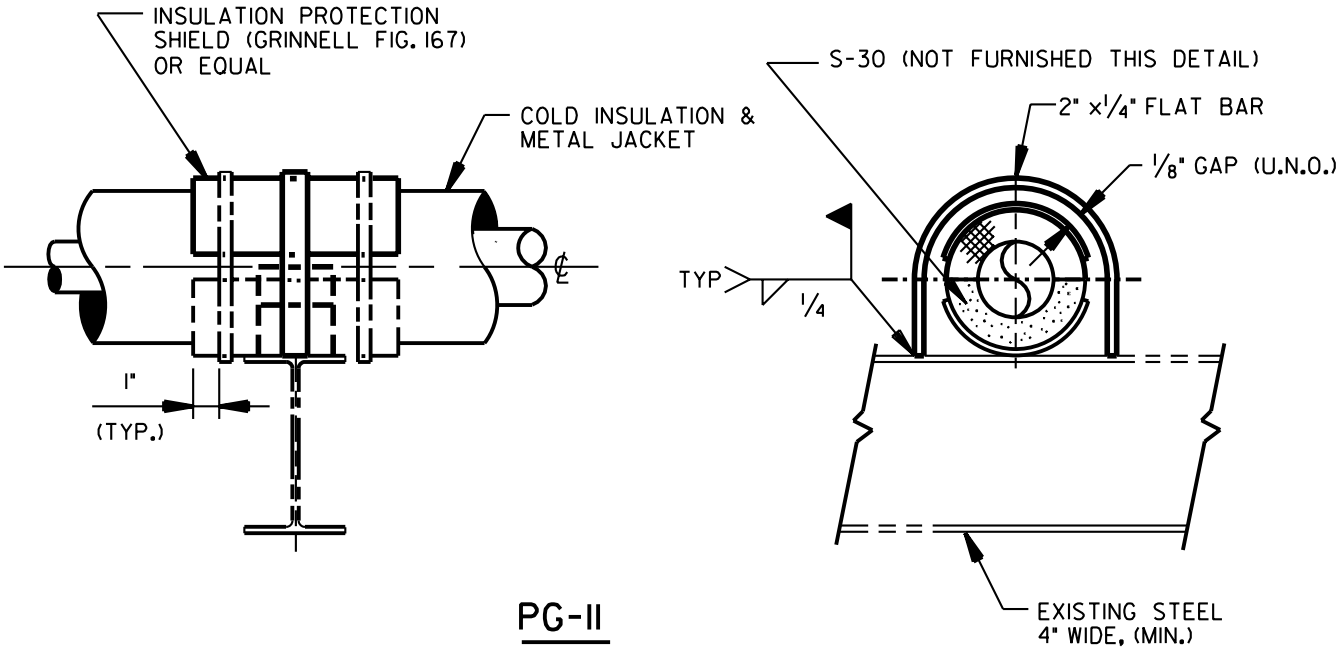
(6" TO 10" PIPE)



MARK NO.	LINE SIZE	DIMENSIONS		MEMBER "A"	MEMBER "B"
		"X"	"Y"		
PG-5	12"	5 3/4"	3"	L 2 1/2 X 2 1/2 X 5/16"	WT4 X 9
PG-6	14"	6 3/8"	3 1/2"	L 3 X 3 X 3/8"	WT4 X 9
PG-7	16"	7 3/8"	4 1/4"	L 4 X 4 X 3/8"	WT4 X 9
PG-8	18"	8 1/4"	4 3/4"	L4 X 4 X 3/8"	WT4 X 9
PG-9	20"	8 7/8"	5"	L4 X 4 X 3/8"	WT4 X 9
PG-10	24"	10 3/8"	7 1/2"	L4 X 4 X 3/8"	WT5 X 11

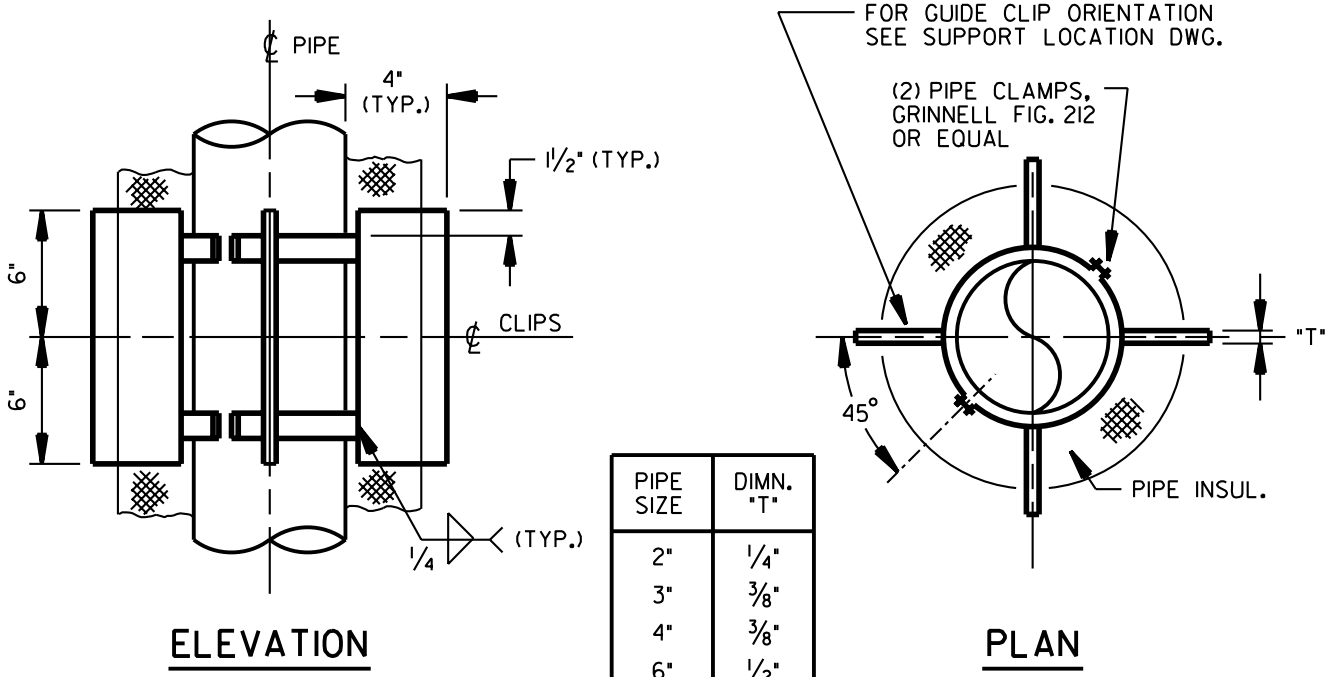
PG-5 THRU 10

(12" TO 24" PIPE)



PG-11

(FOR USE W/COLD INSUL. PIPING)

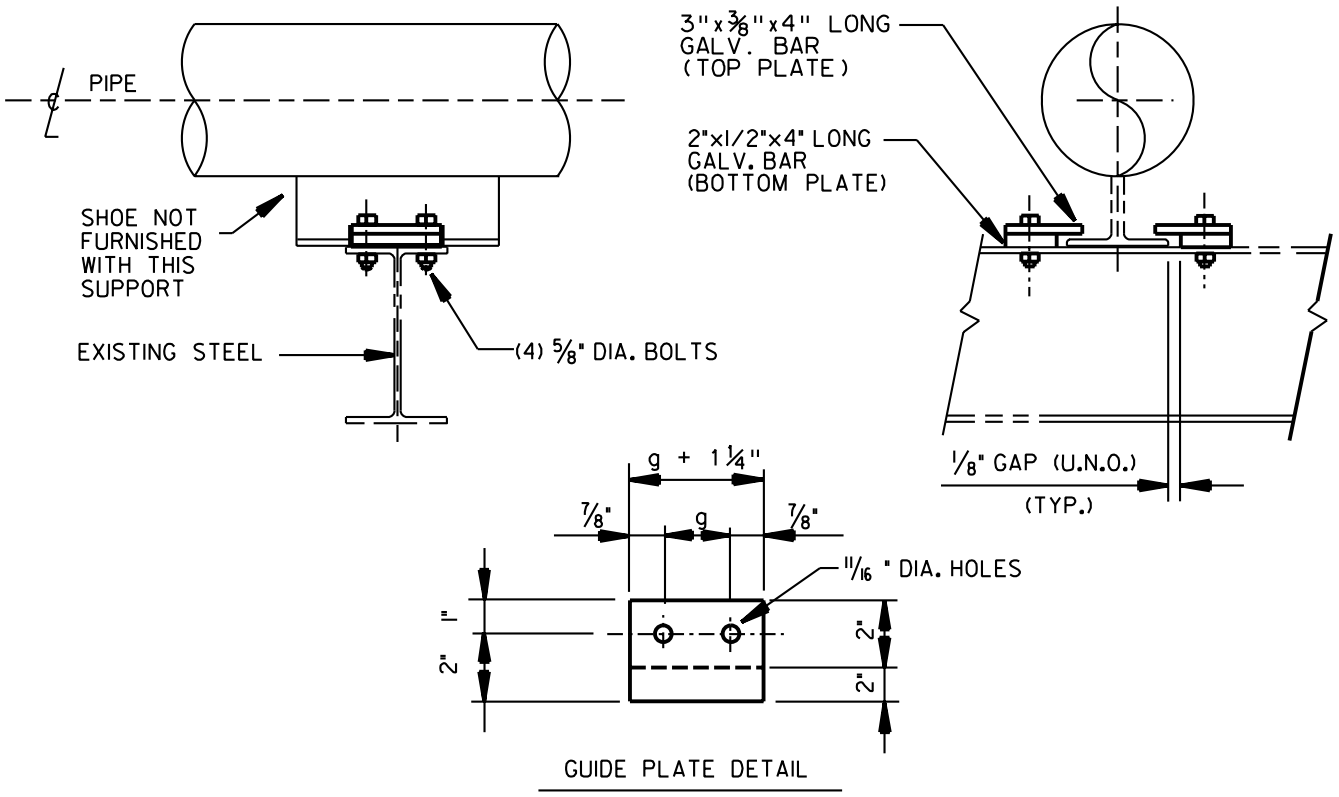


ELEVATION

PLAN

PIPE SIZE	DIMN. "T"
2"	1/4"
3"	3/8"
4"	3/8"
6"	1/2"
8"	1/2"
10"	1/2"
12"	1/2"

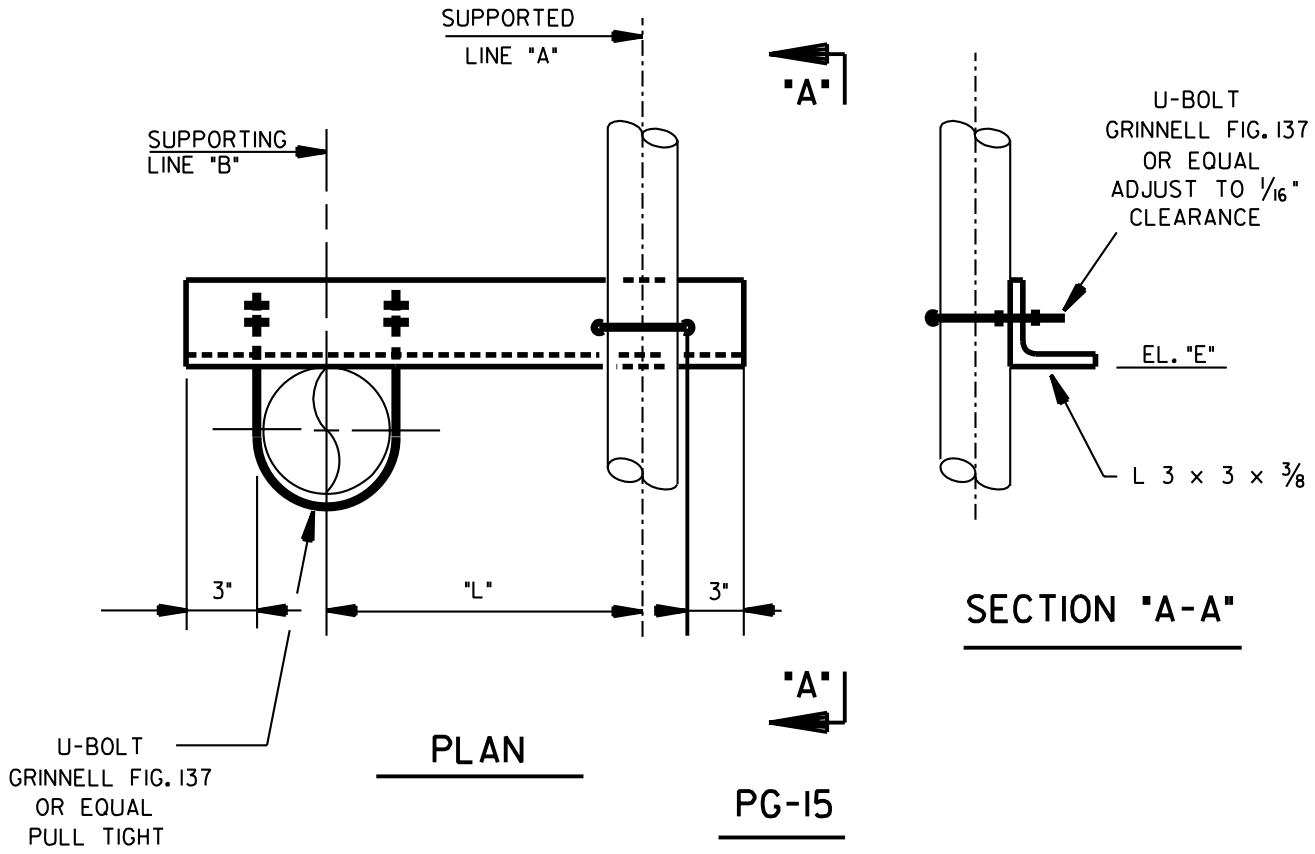
PG-12



GUIDE PLATE DETAIL

PG-13

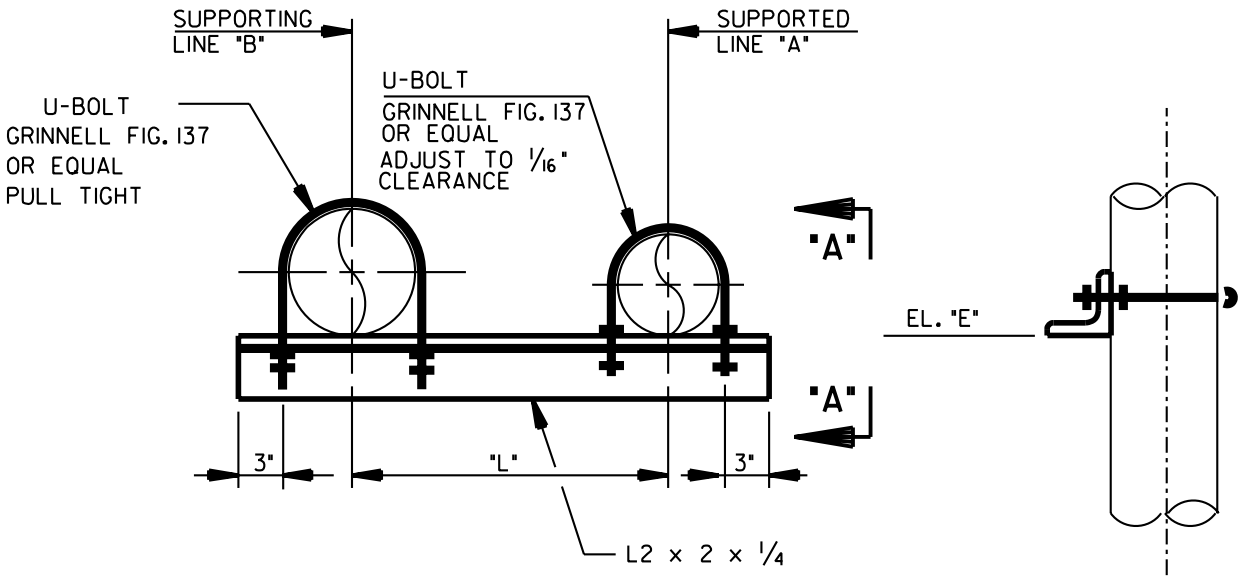
BOLT-ON GUIDE (UP TO 10" PIPE)



PLAN

SECTION "A-A"

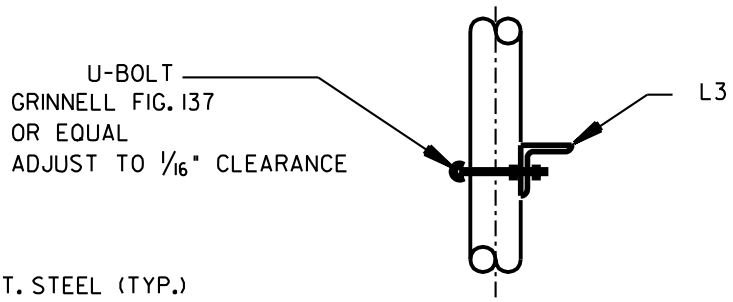
PG-15



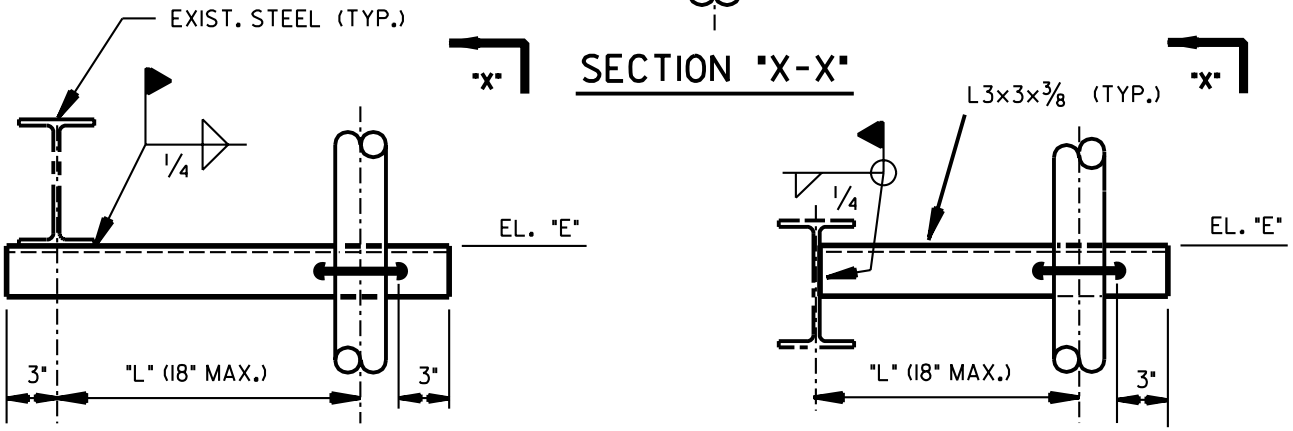
PLAN

SECTION "A-A"

PG-16



SECTION "X-X"

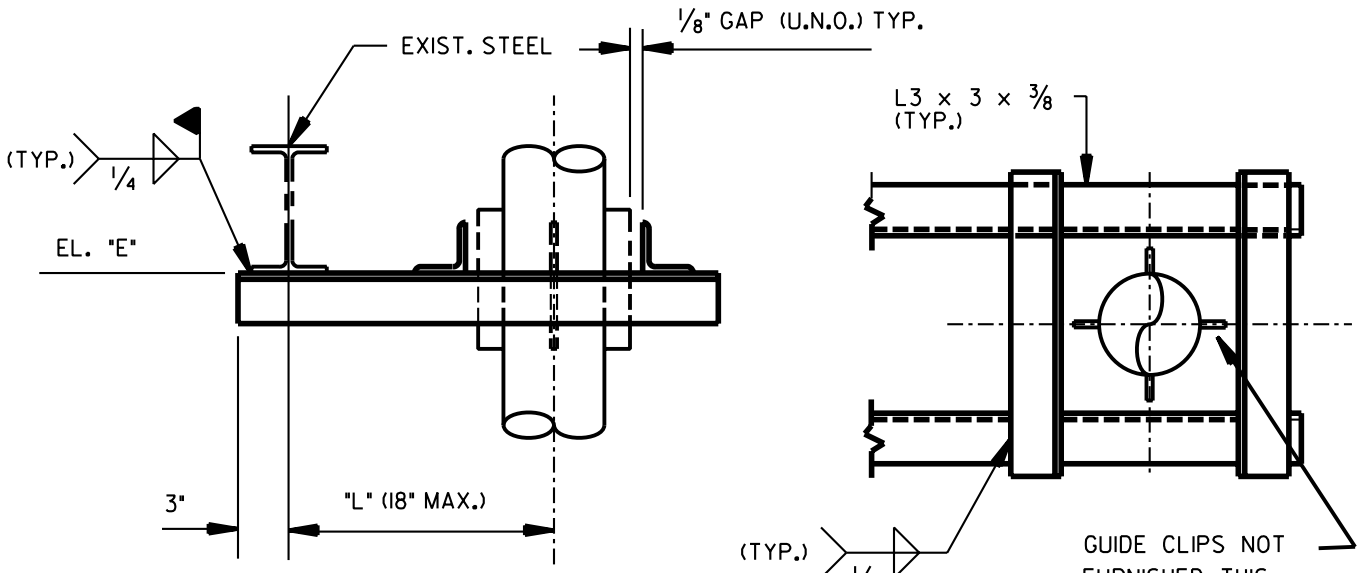


ELEVATION
TYPE I

ELEVATION
TYPE II

PG-17

(LOAD LIMIT 500 lbs. HORIZONTAL)
SEE SECTIONS 10.2 & 10.6



ELEVATION

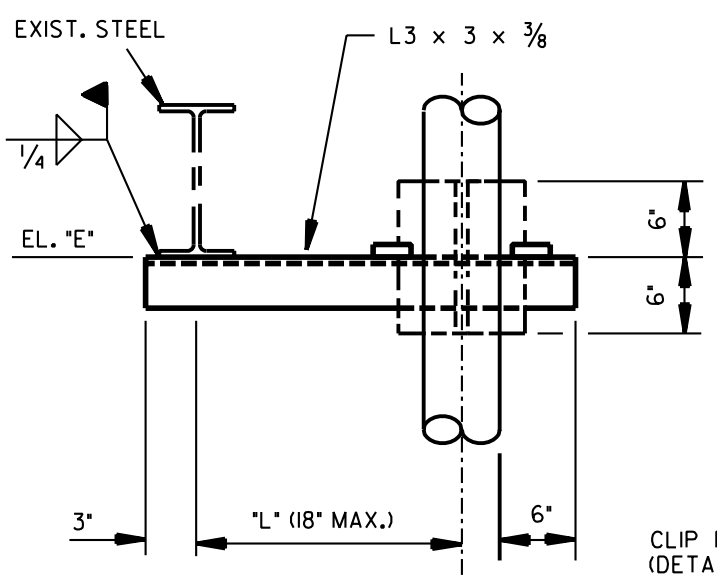
PLAN

NOTE:

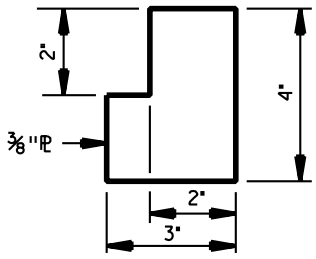
GUIDE BRACKET MAY BE WELDED TO TOP OR BOTTOM OF EXISTING STEEL

PG-18

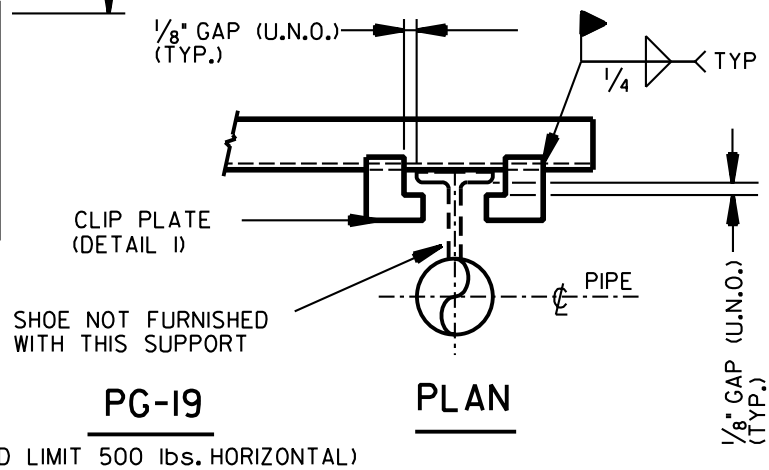
(LOAD LIMIT 1000 lbs. HORIZONTAL)
SEE SECTIONS 10.2 & 10.6



ELEVATION



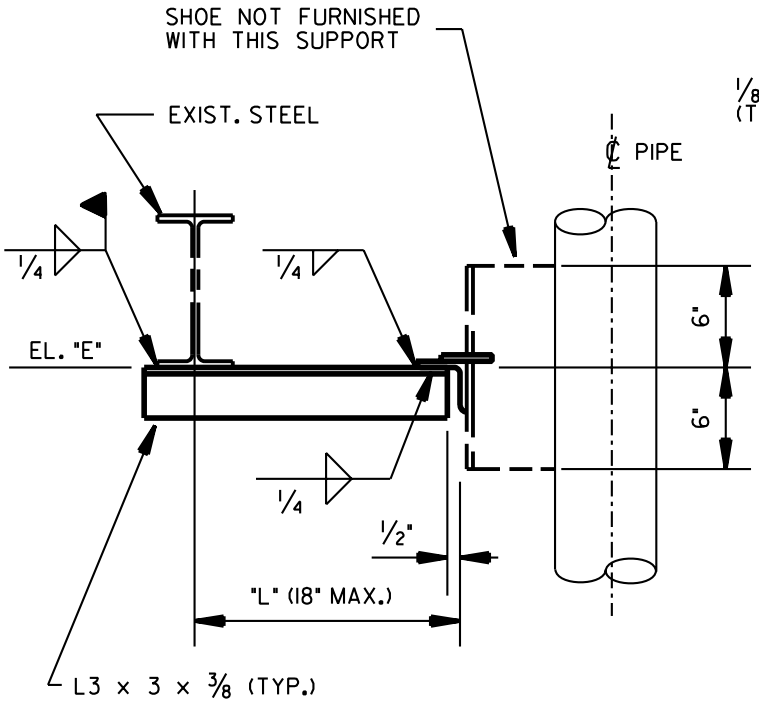
DETAIL 1



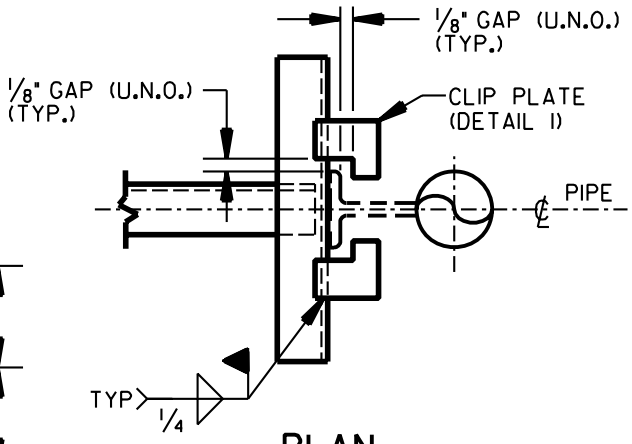
PLAN

PG-19

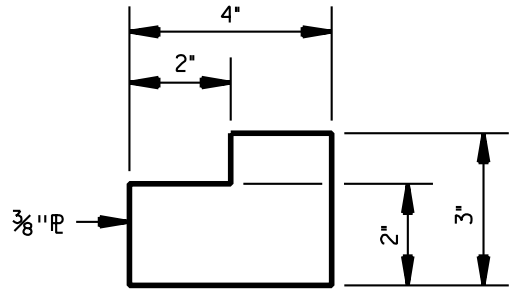
(LOAD LIMIT 500 lbs. HORIZONTAL)
SEE SECTIONS 10.2 & 10.6



ELEVATION



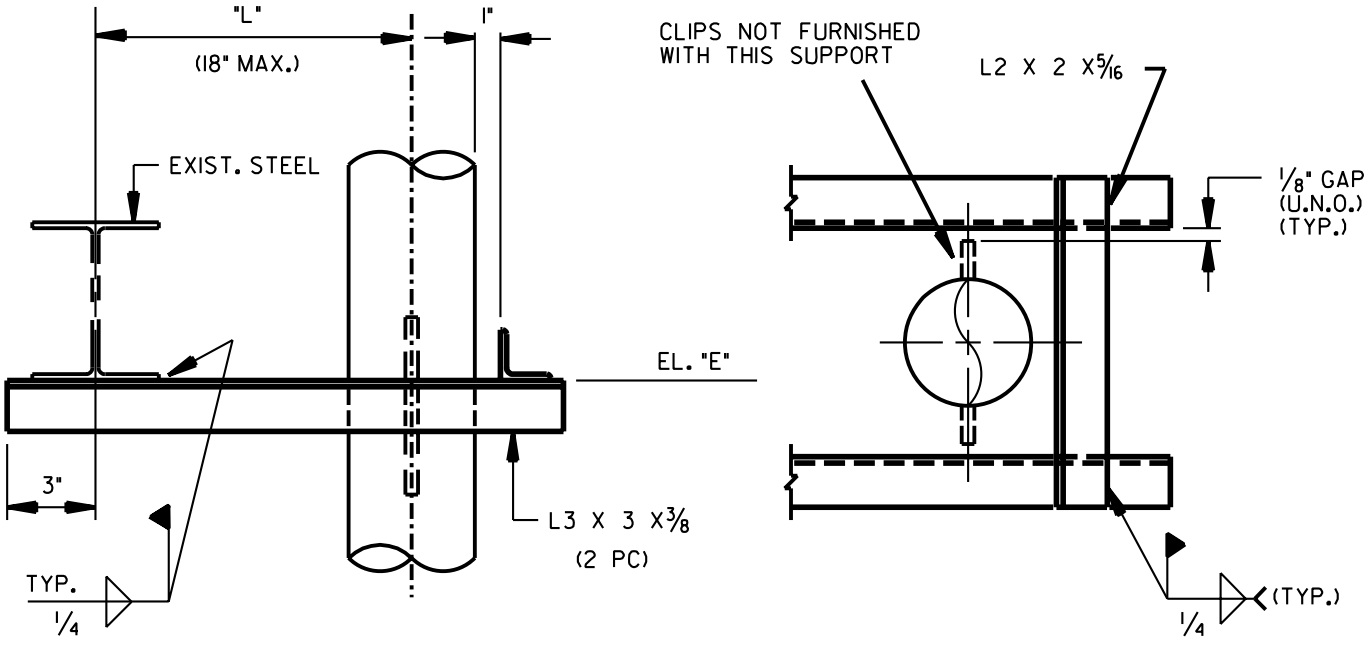
PLAN



DETAIL 1

PG-20

(LOAD LIMIT 500 lbs. HORIZONTAL)
SEE SECTIONS 10.2 & 10.6

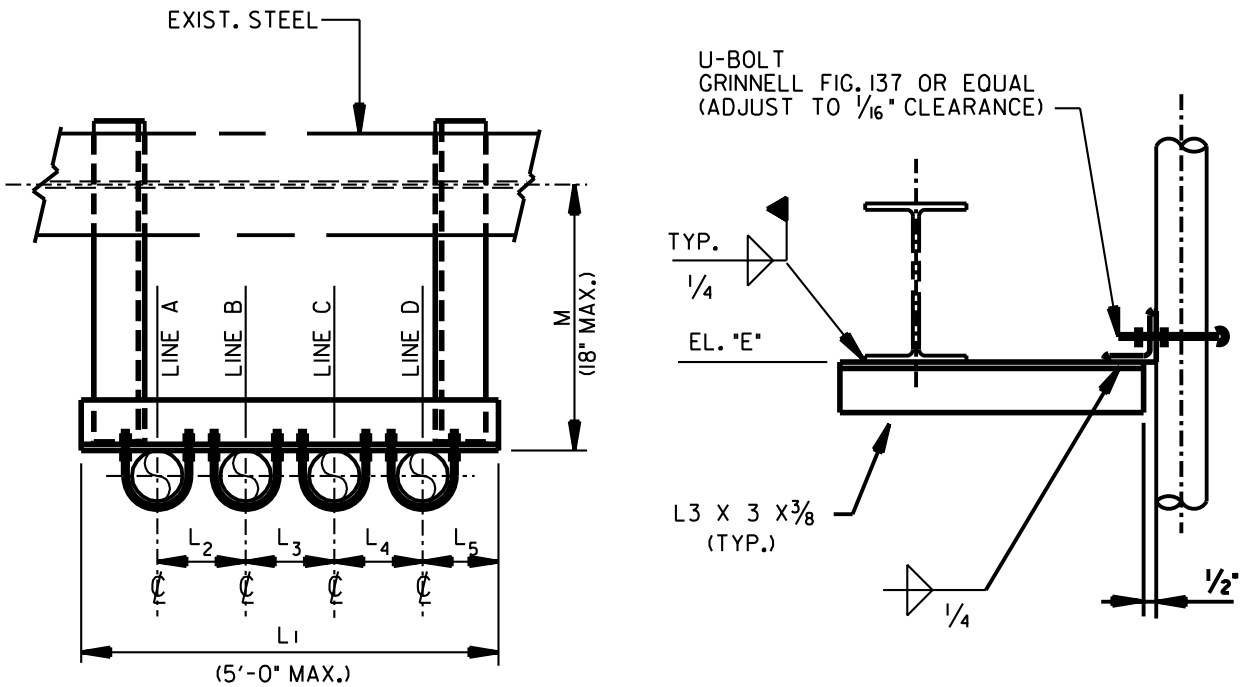


ELEVATION

PLAN

PG-21

(LOAD LIMIT 1000 lbs. HORIZONTAL)
SEE SECTIONS 10.2 & 10.6

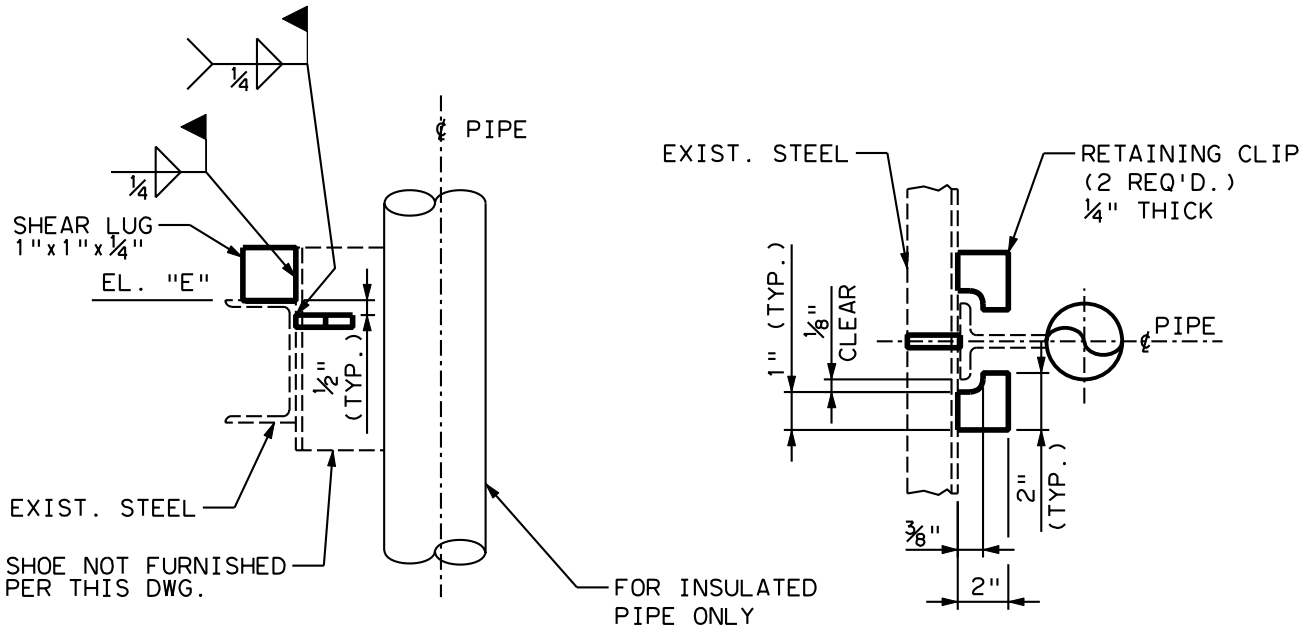


PLAN

ELEVATION

PG-22

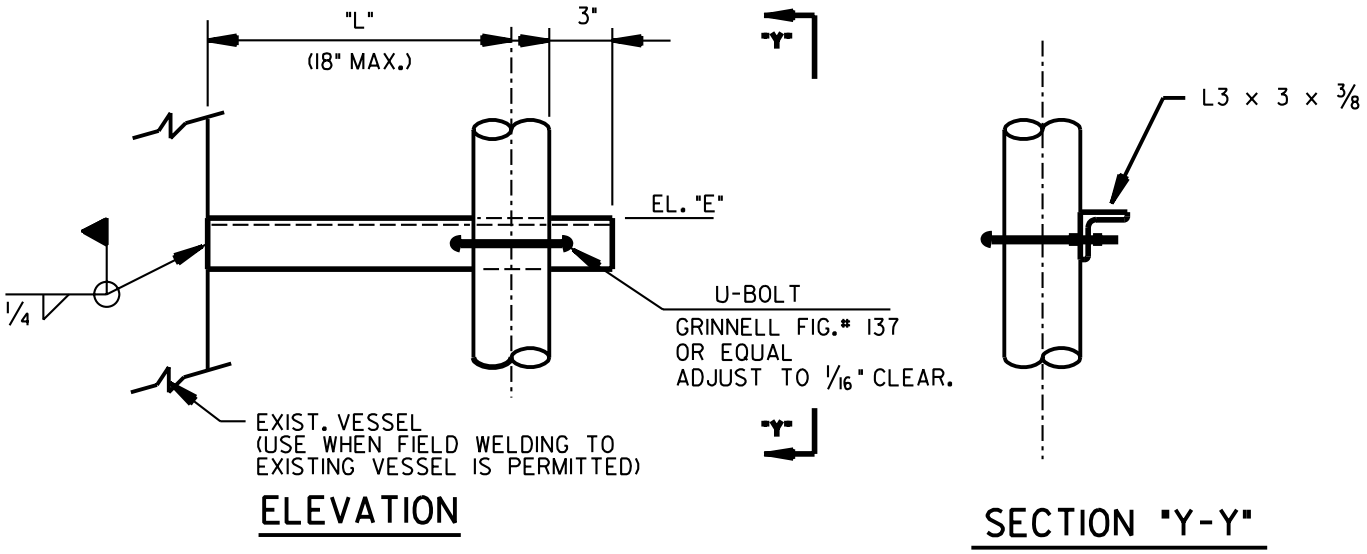
(LOAD LIMIT 1000 lbs. HORIZONTAL)
SEE SECTIONS 10.2 & 10.6



ELEVATION PLAN

PG-23

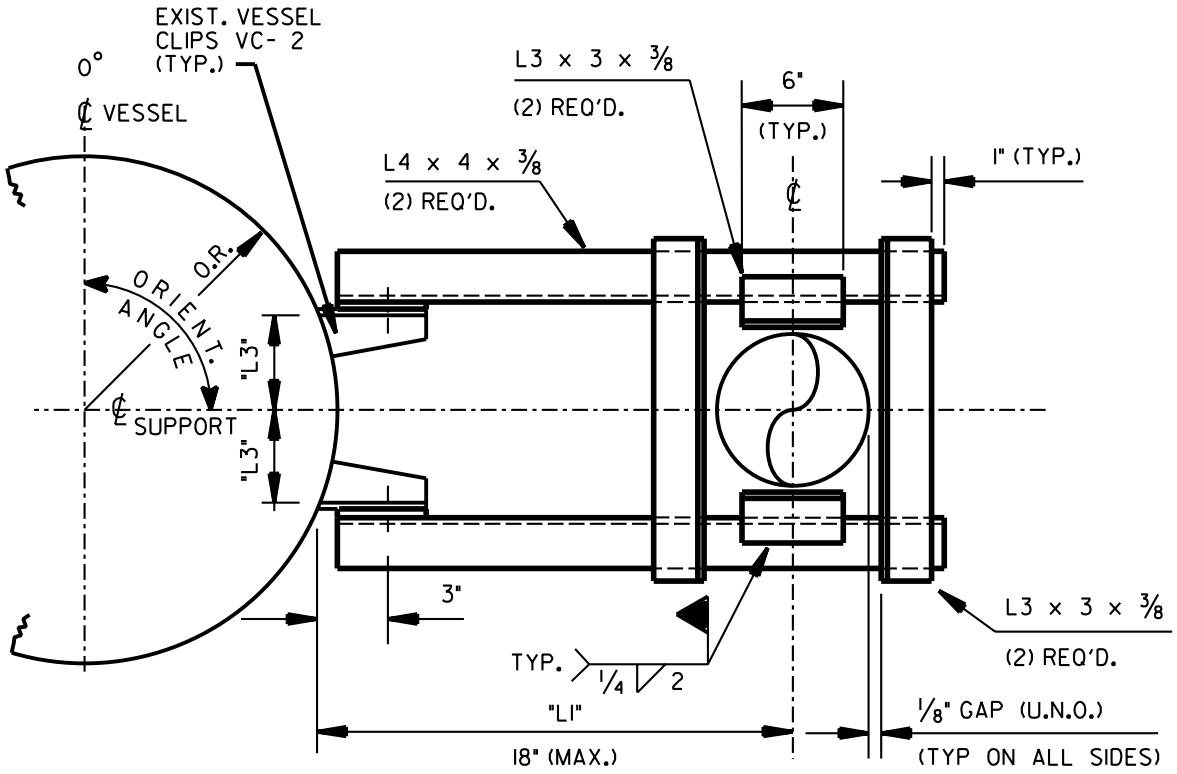
(LOAD LIMIT 500 lbs. HORIZONTAL)
SEE SECTION 10.2



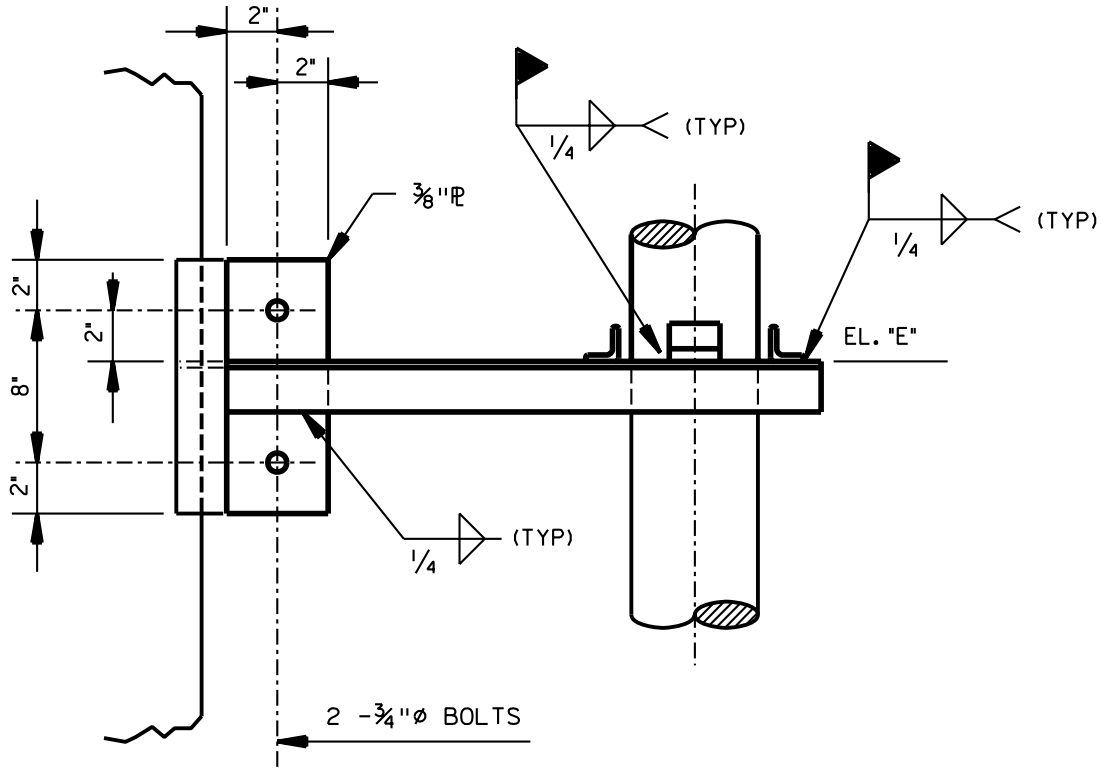
ELEVATION SECTION "Y-Y"

PG-24

USE UP TO 3" MAX. PIPE SIZE
(SEE SECTION 10.3)



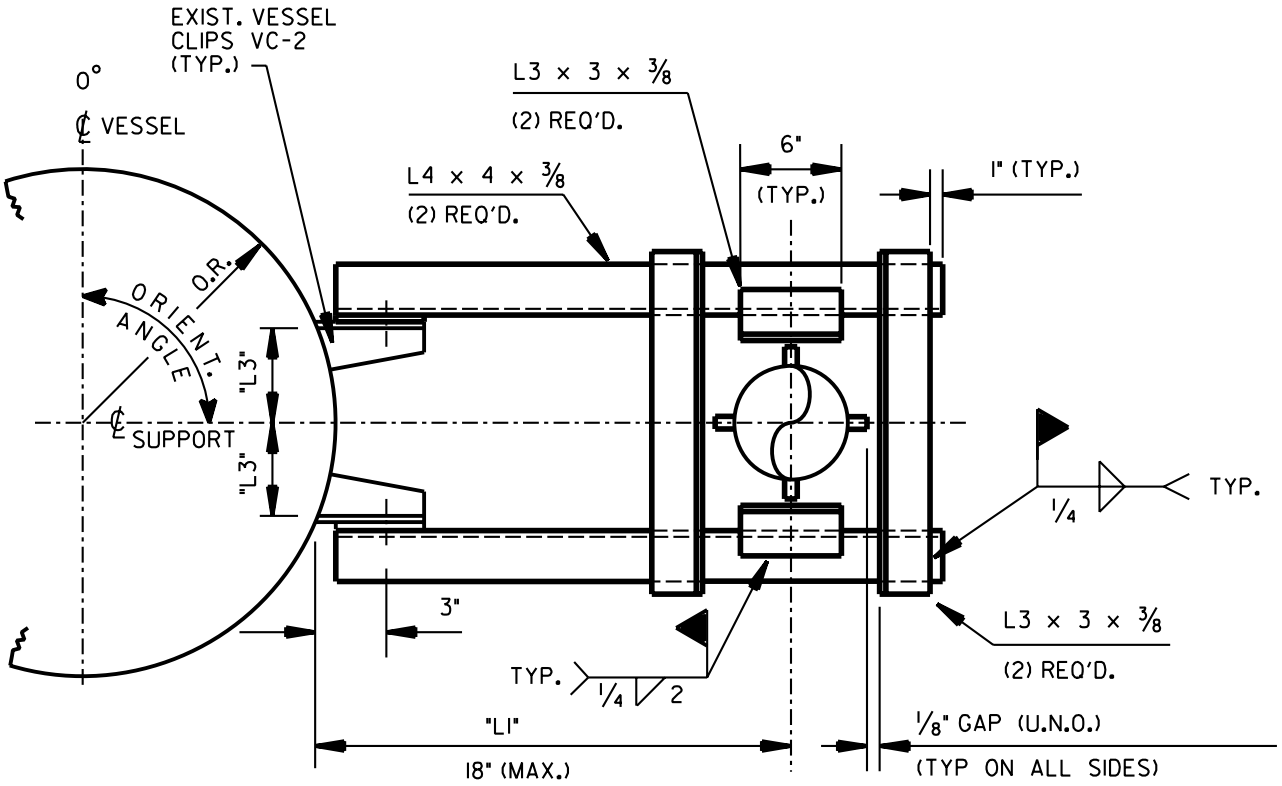
PLAN



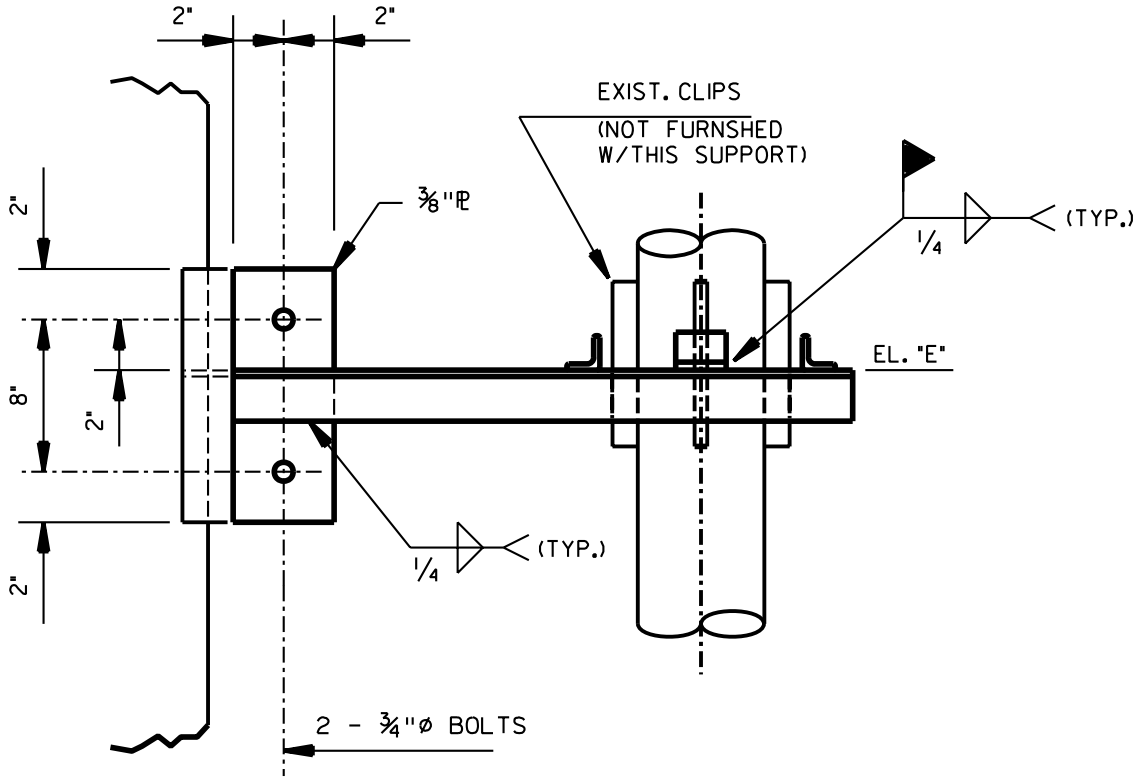
ELEVATION

PG-25

(SEE SECTIONS 10.2 & 10.3)



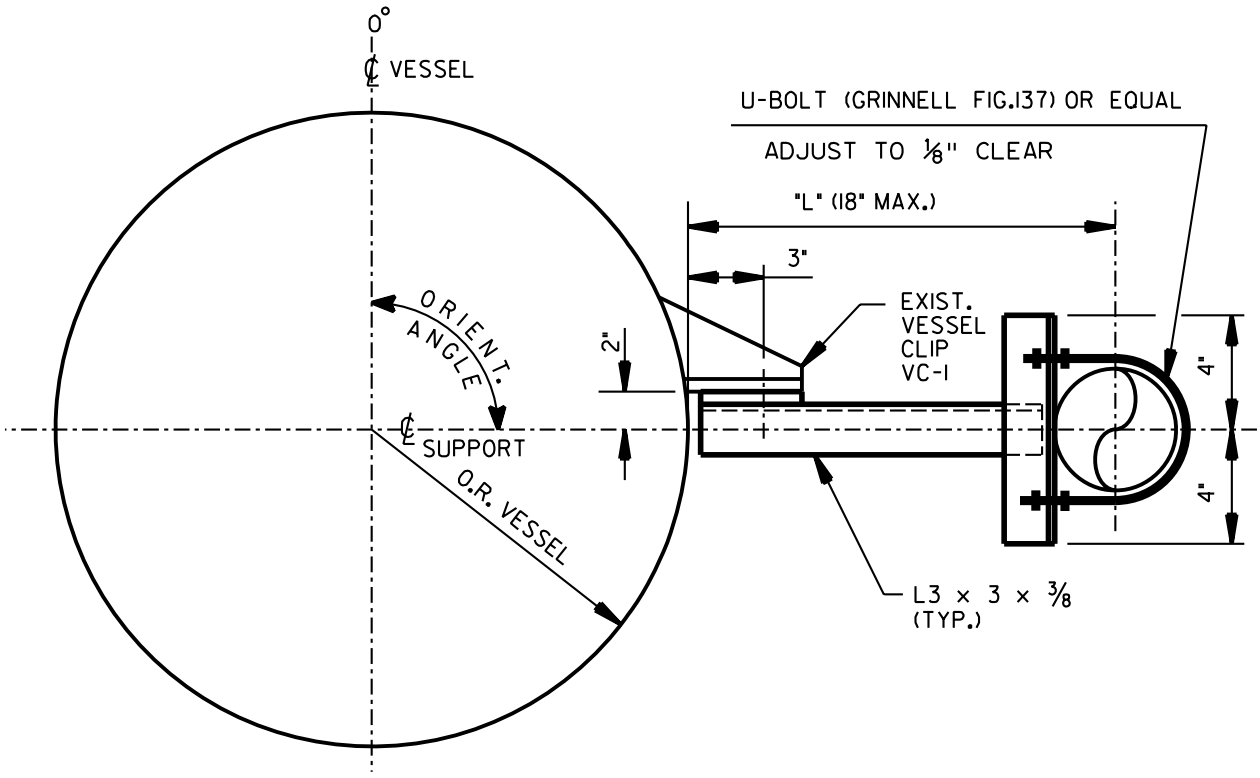
PLAN



ELEVATION

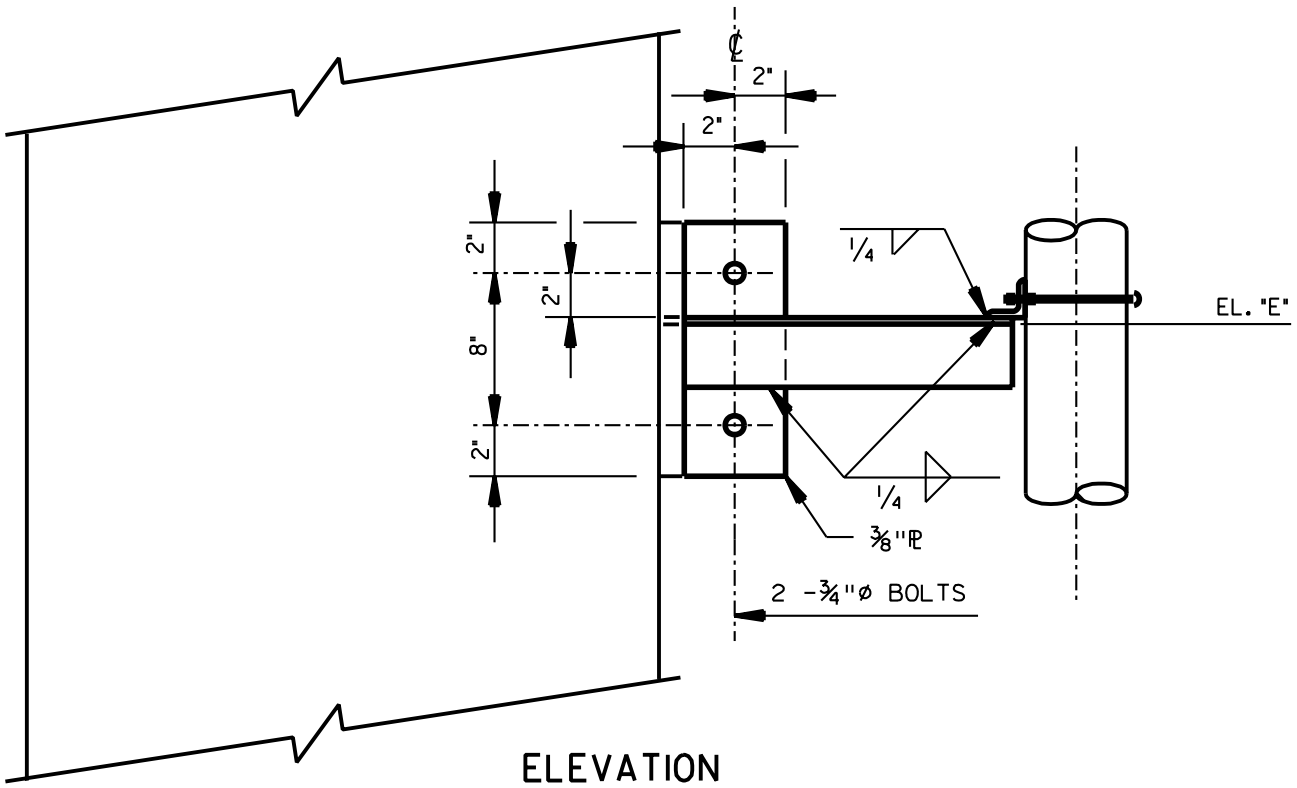
PG-26

(SEE SECTION 10.2 & 10.3)



USE UP TO 3" MAX. PIPE SIZE

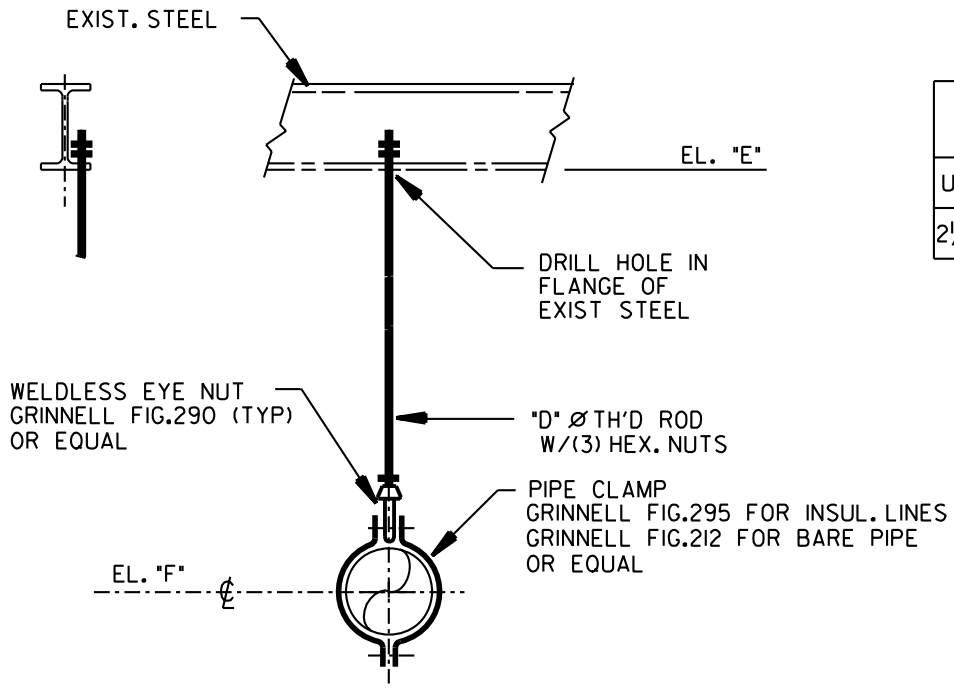
PLAN



ELEVATION

PG-27

(SEE SECTION 10.2 & 10.3)

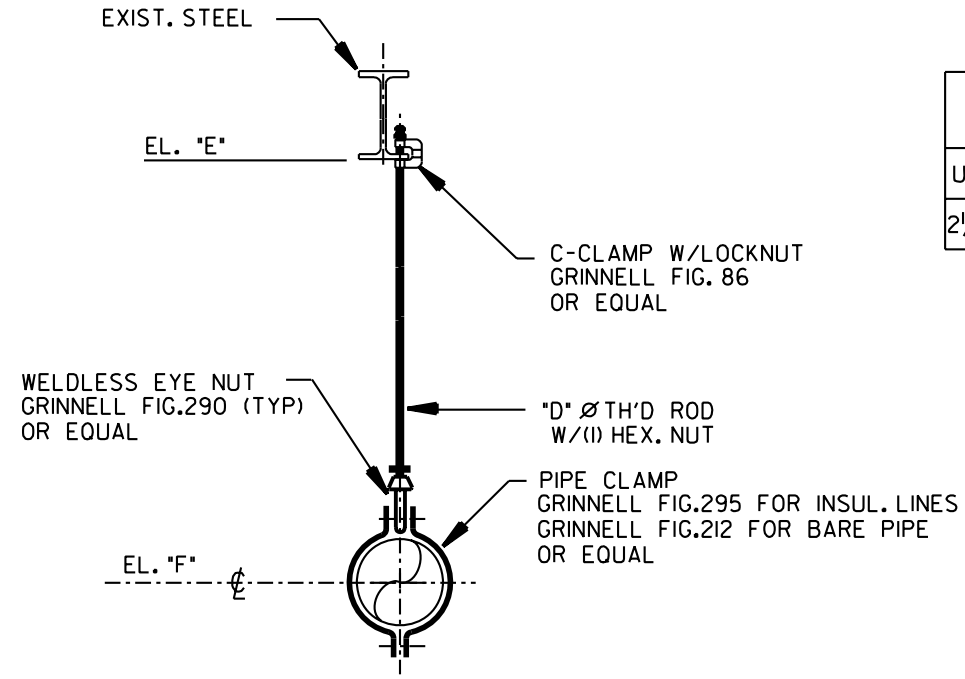


PIPE SIZE	ROD Ø "D"	MAX.LOAD (LBS)
UP TO 2"	3/8"	610
2 1/2" TO 3"	1/2"	1130

ELEVATION

PH-1

(USE UP TO 3" PIPE SIZE)

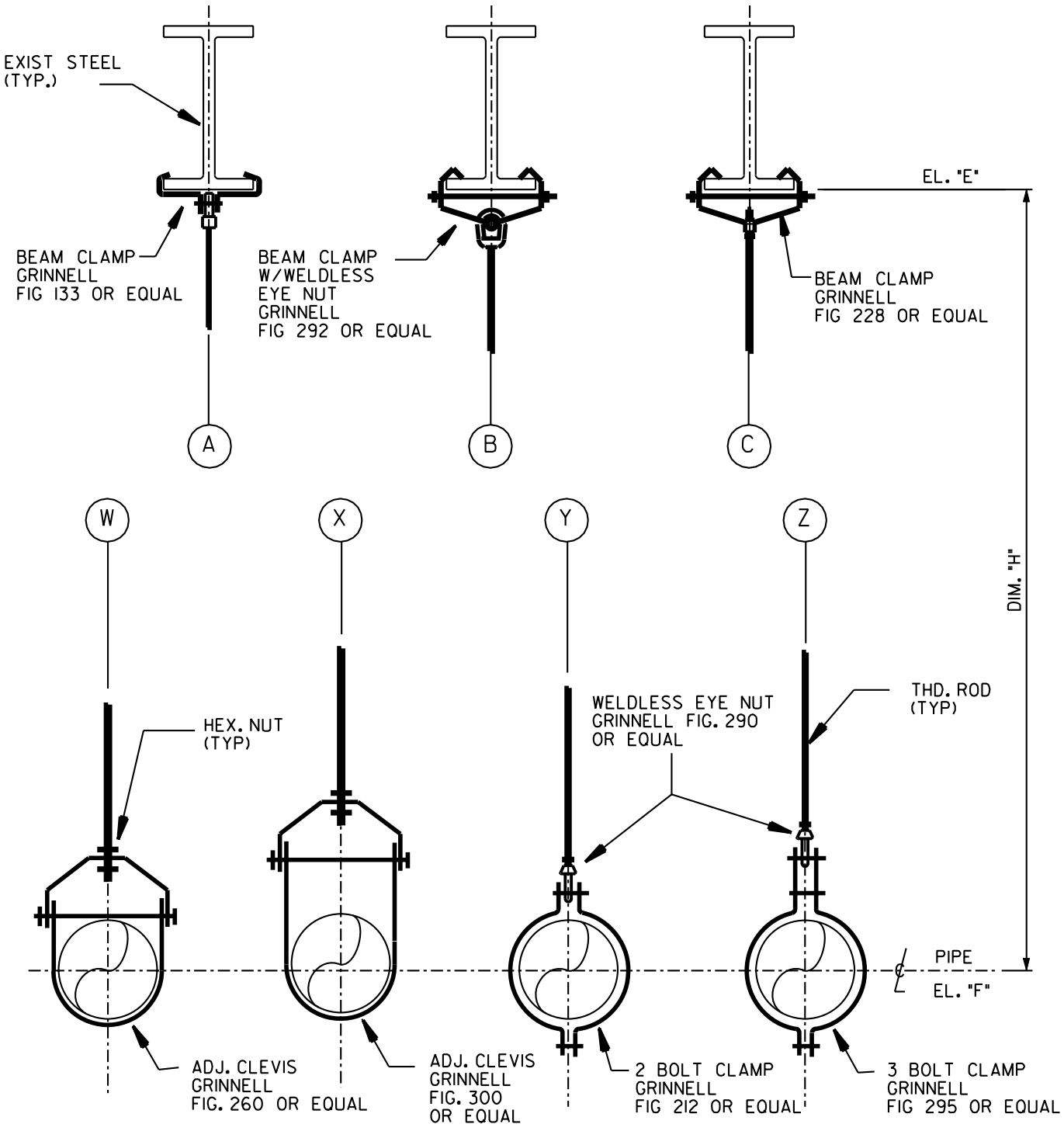


PIPE SIZE	ROD Ø "D"	MAX.LOAD (LBS)
UP TO 2"	3/8"	400
2 1/2" TO 3"	1/2"	400

ELEVATION

PH-2

(USE UP TO 3" PIPE SIZE)



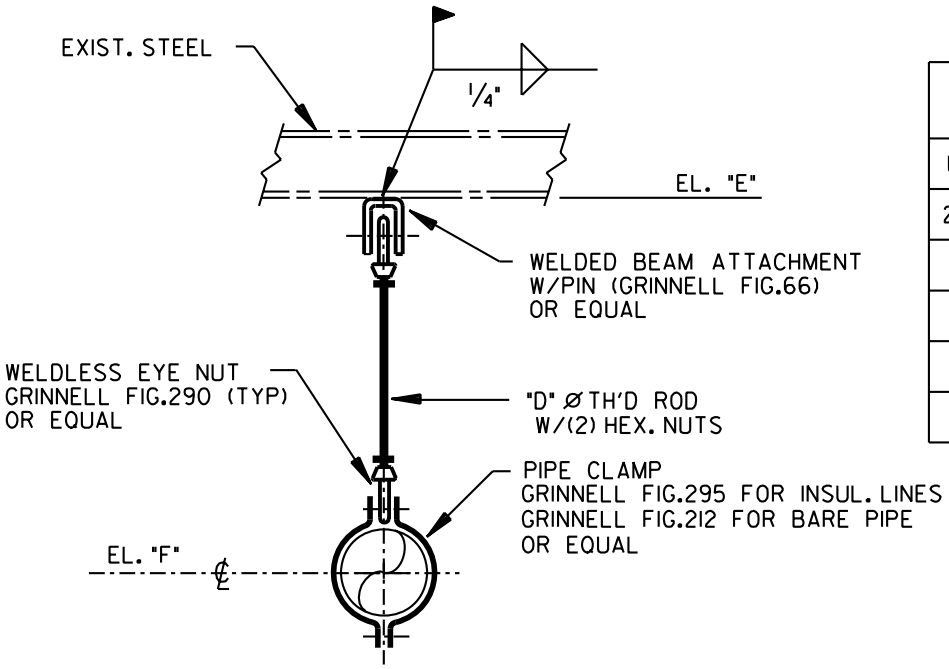
NOTES:

THIS HANGER DETAIL ALLOWS THE COMBINATION OF VARIOUS BEAM CLAMPS AND PIPE CLAMPS.

THE HANGER SHOULD BE SPECIFIED AS
PH-3-C-Y-65½" FOR EXAMPLE,
WHERE C INDICATES THE TOP CONNECTION,
AND Y INDICATES THE BOTTOM CONNECTION
65½" INDICATES DIMENSION "H"

THE LOADING CRITERIA MUST BE CHECKED FOR EACH COMBINATION SELECTED

PH-3

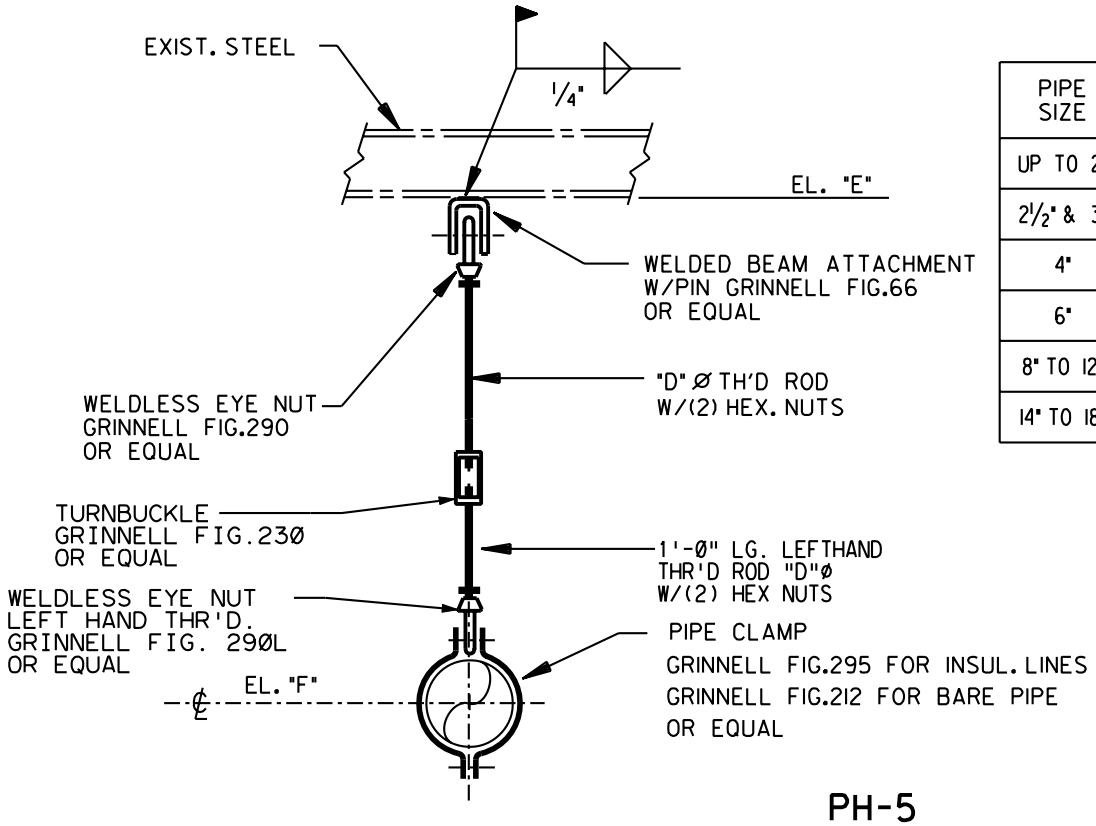


PIPE SIZE	ROD Ø"D"	MAX.LOAD (LBS)
UP TO 2"	3/8"	610
2 1/2" TO 3"	1/2"	1130
4"	5/8"	1810
6"	3/4"	2710
8" TO 12"	7/8"	3770
14" TO 18"	1"	4960

ELEVATION

PH-4

FOR ROD LENGTH
LESS THAN 6 FEET

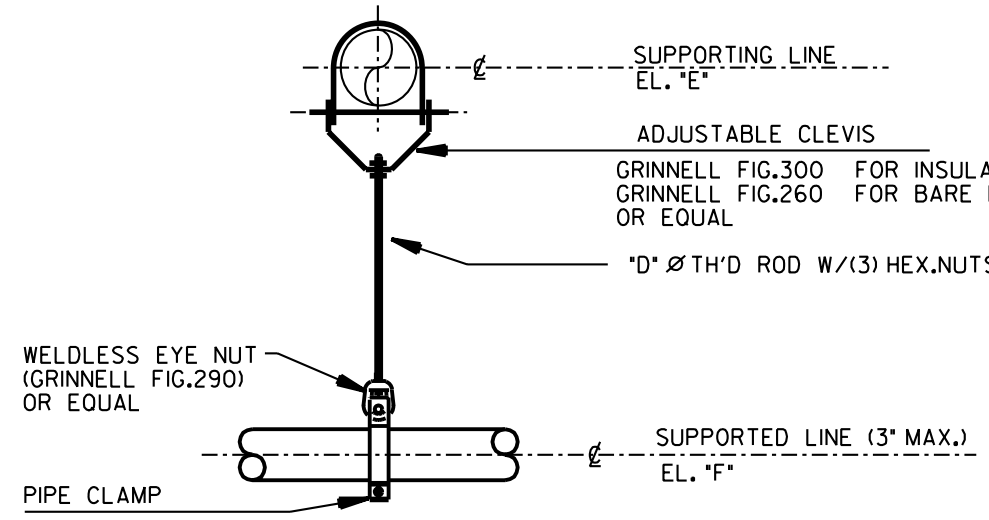


PIPE SIZE	ROD Ø"D"	MAX.LOAD (LBS)
UP TO 2"	3/8"	610
2 1/2" & 3"	1/2"	1130
4"	5/8"	1810
6"	3/4"	2710
8" TO 12"	7/8"	3770
14" TO 18"	1"	4960

ELEVATION

PH-5

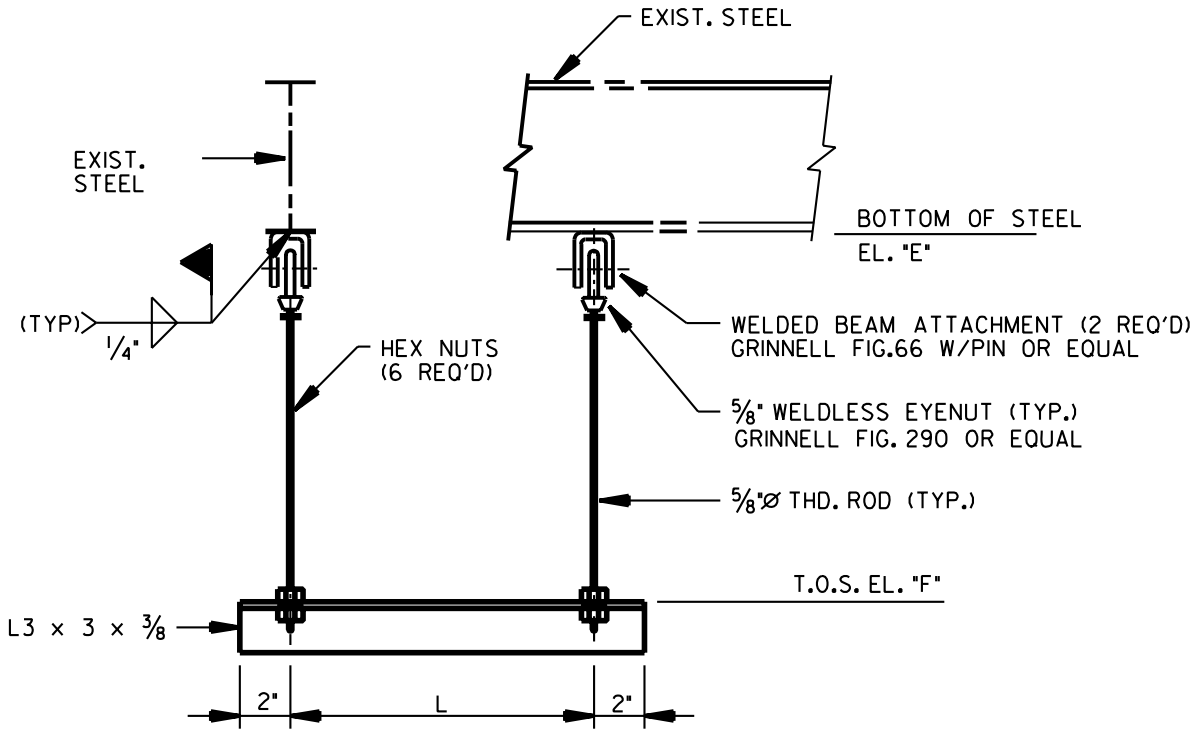
FOR ROD LENGTH
MORE THAN 6 FEET



SUPPORTED LINE SIZE	ROD Ø "D"
UP TO 2"	3/8"
2 1/2" & 3"	1/2"

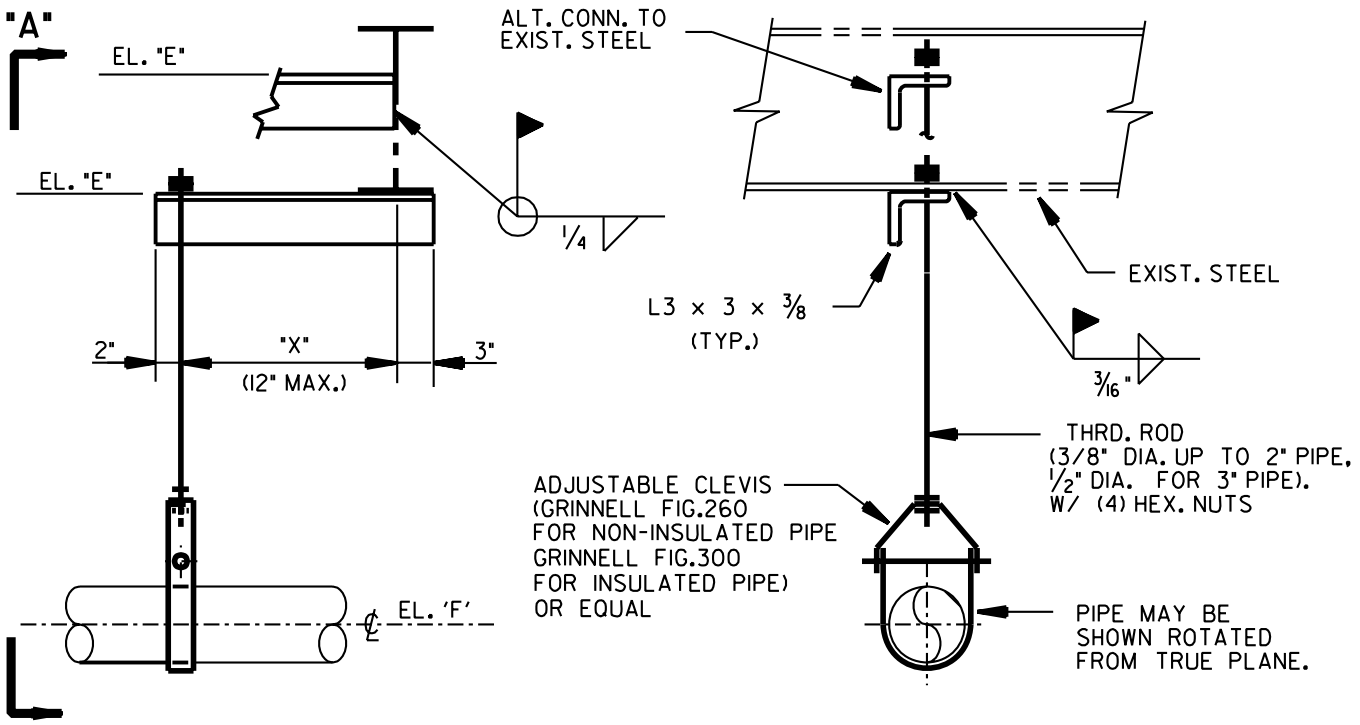
ELEVATION

PH-6



ELEVATION

PH-7

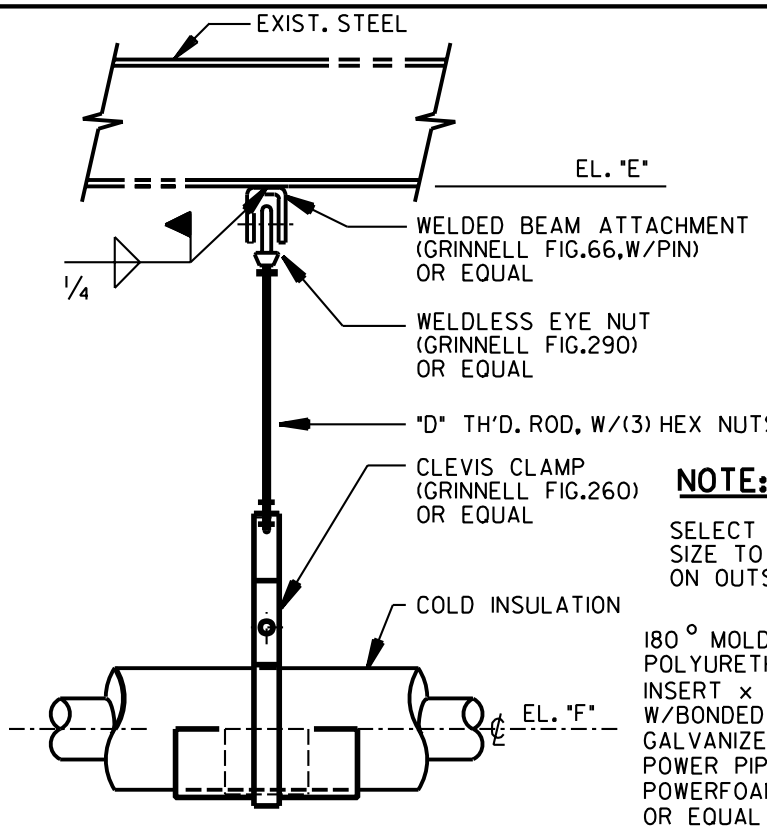


ELEVATION

SECTION "A-A"

PH-8

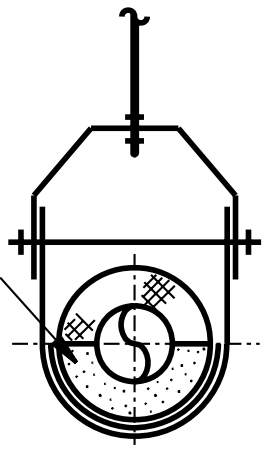
(LOAD LIMIT 250 lbs.
SEE SECTION 10.2)



PIPE SIZE	ROD ⌀"D"	MAX. LOAD
UP TO 2"	3/8"	250 LBS.
2 1/2" & 3"	1/2"	350 LBS.
4"	5/8"	400 LBS.
6" TO 8"	3/4"	900 LBS.

NOTE:

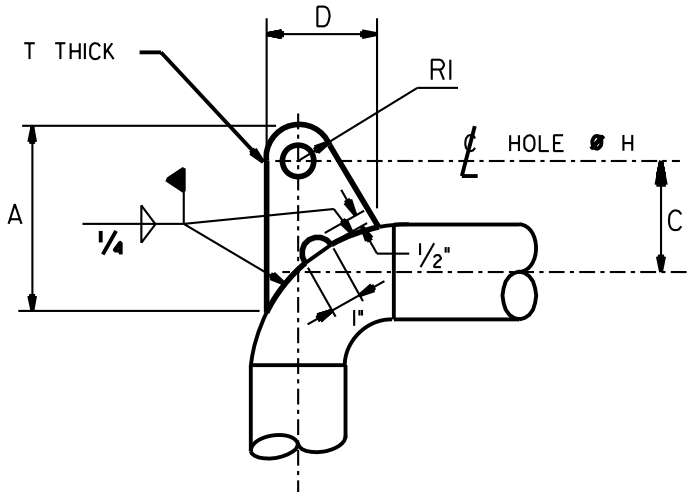
SELECT CLAMP & SHIELD
SIZE TO SUPPORT PIPE
ON OUTSIDEOF INSULATION.



180° MOLDED RIGID
POLYURETHANE FOAM
INSERT x 6" LONG
W/BONDED VAPOR BARRIER &
GALVANIZED STEEL SHIELD
POWER PIPE SUPPORTS INC.
POWERFOAM FIG. NO. 9050
OR EQUAL

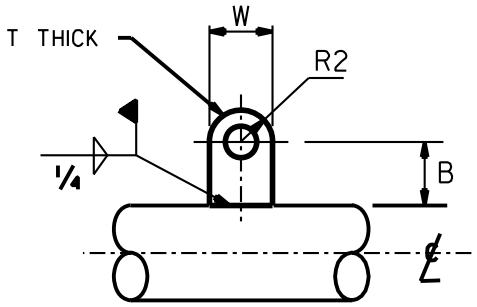
PH-9

(FOR COLD INSUL. PIPING)



TYPE I

ELBOW LUG



TYPE II

PIPE LUG

ELBOW/PIPE SIZE	DIMENSIONS (INS)								
	A	B	C	D	H	R1	R2	T	W
2	8	3	4	3 1/2	11/16	1 1/2	1 1/4	1/4	2 1/2
3	8	3	4	3 1/2	13/16	1 1/2	1 1/4	3/8	2 1/2
4	9	4	5	3 1/2	15/16	1 1/2	1 1/4	3/8	2 1/2
6	10	5	6	3 1/2	1 1/8	1 1/2	1 1/4	1/2	2 1/2
8	10 3/4	5	6 1/2	3 1/2	1 1/8	1 1/2	1 1/4	1/2	2 1/2
10	11 3/4	5	6 1/2	3 1/2	1 1/8	1 1/2	1 1/4	1/2	2 1/2
12	12	5	7	3 1/2	1 1/8	1 1/2	1 1/4	1/2	2 1/2

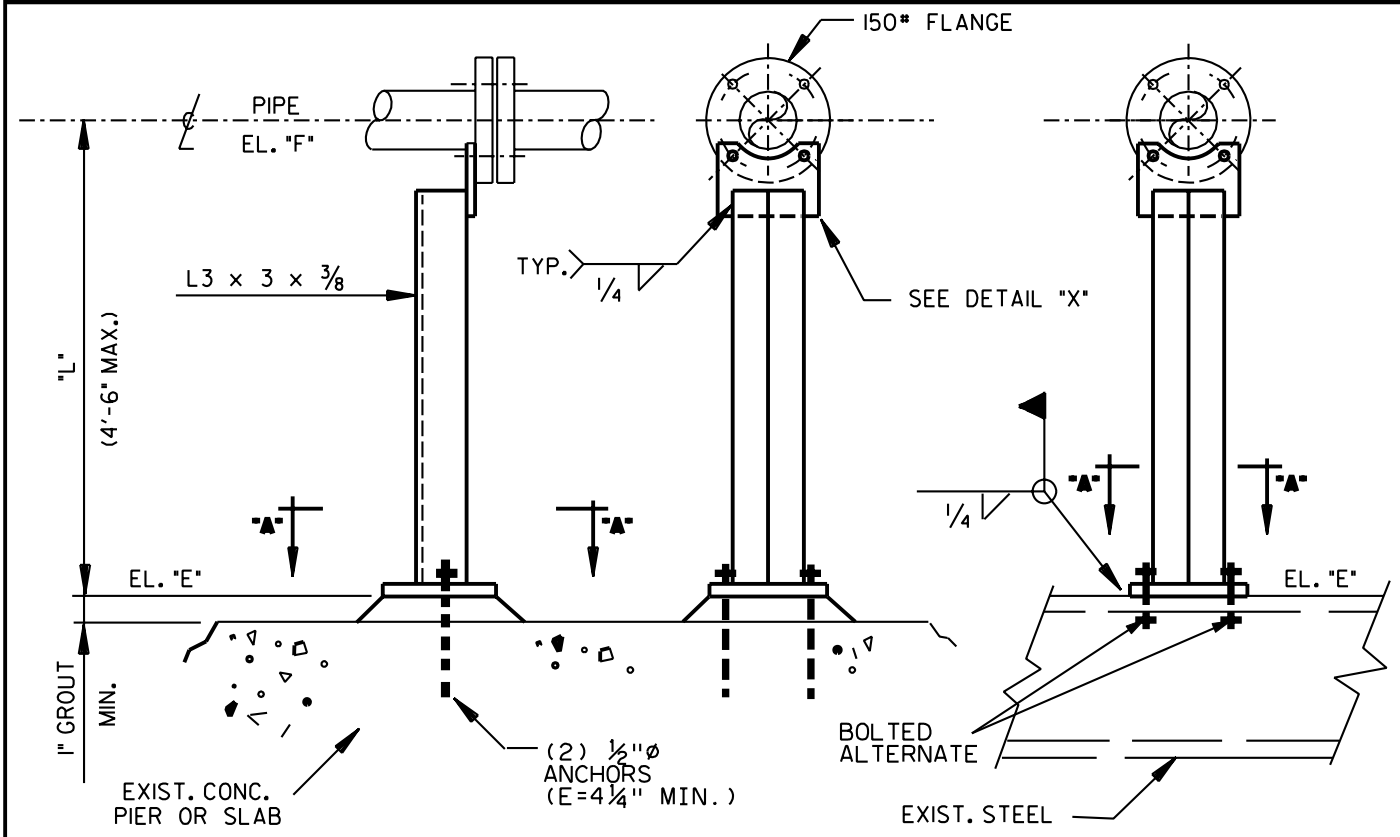
GENERAL NOTES:

1. DO NOT BURN OR CUT THRU' ELBOW OR PIPE WALL.
2. THESE LUGS ARE DESIGNED FOR USE WITH STD. WT. PIPING.
3. LUG MATERIAL SHALL BE THE SAME AS THE RUN PIPE, UNLESS OTHERWISE NOTED.

PL-1

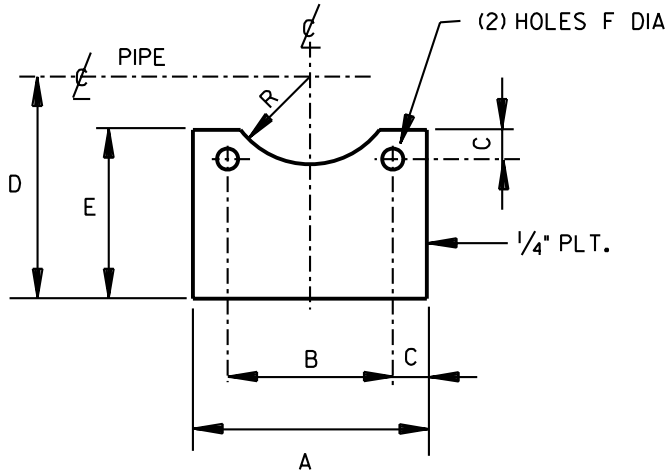
PIPE LUG

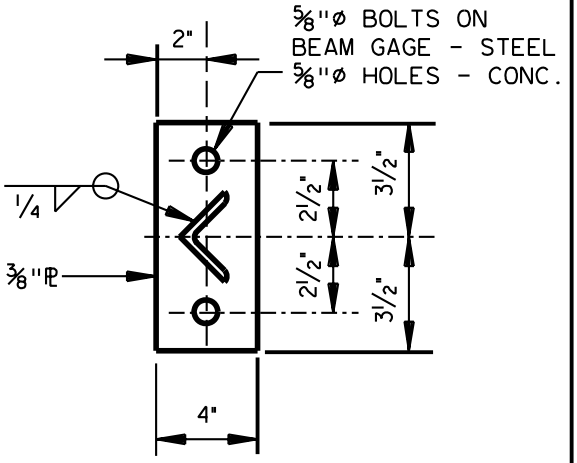
ENGINEERED PIPE SUPPORTS



TYPE 1

TYPE 2





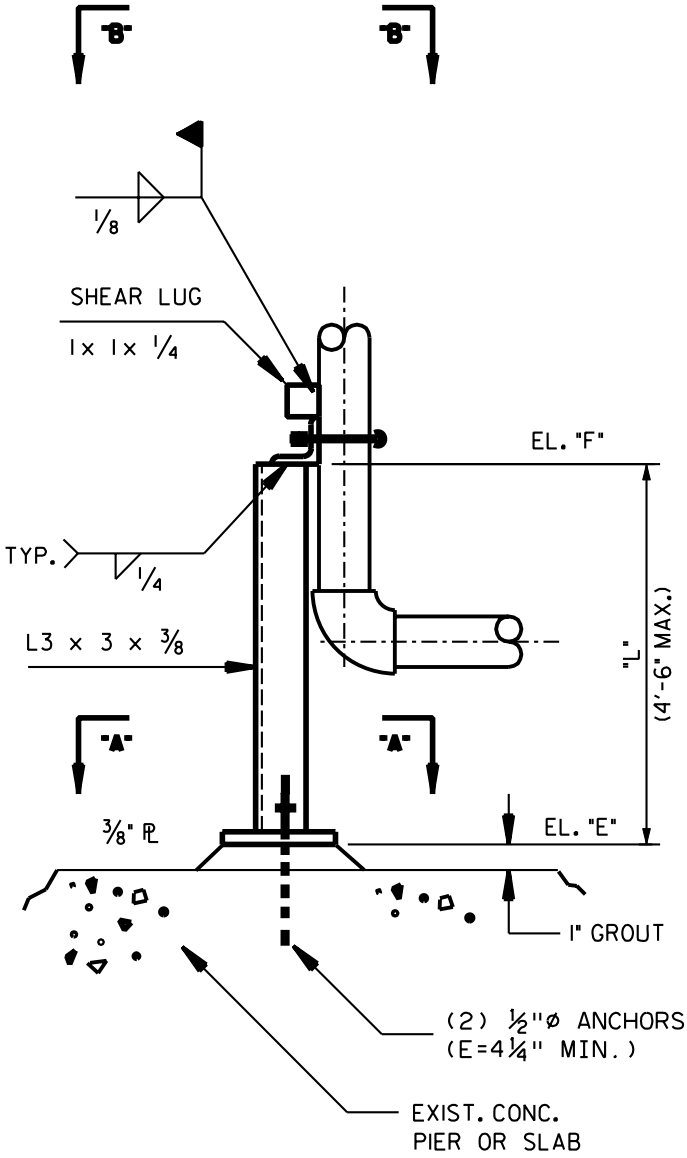
DETAIL 'X'

PIPE SIZE	A	B	C	D	E	F	R
1"	3 3/4"	2 1/4"	3/4"	5 1/8"	4 3/4"	5/8"	1"
1 1/2"	4 1/2"	2 3/4"	7/8"	5 1/2"	5"	5/8"	1 1/2"
2"	5"	3 3/8	1 3/16"	6"	5 1/8"	3/4"	1 5/8"
3"	6"	4 1/4"	7/8"	6 3/4"	5 1/2"	3/4"	2 1/4"
4"	5"	2 7/8"	1 1/16"	7 1/2"	5 1/16"	3/4"	2 7/8"
6"	6"	3 5/8"	1 3/16"	8 1/2"	5 5/16"	7/8"	3 7/8"

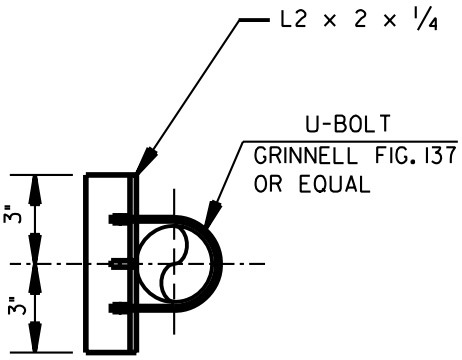
SECTION "A-A"

PS-1

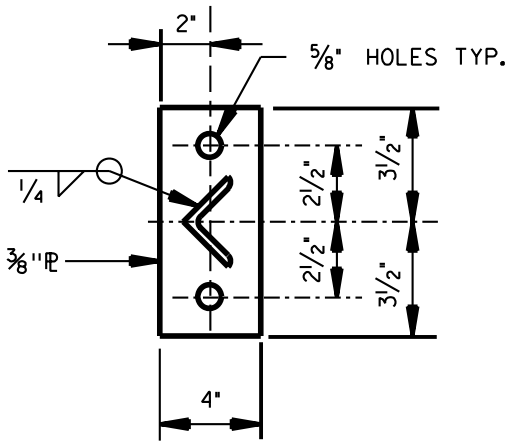
USE UP TO 6" MAX. PIPE SIZE
EITHER DIMENSION "L" OR ELEVATIOS "E" & "F" ARE REQUIRED ON PIPING DRAWING



ELEVATION



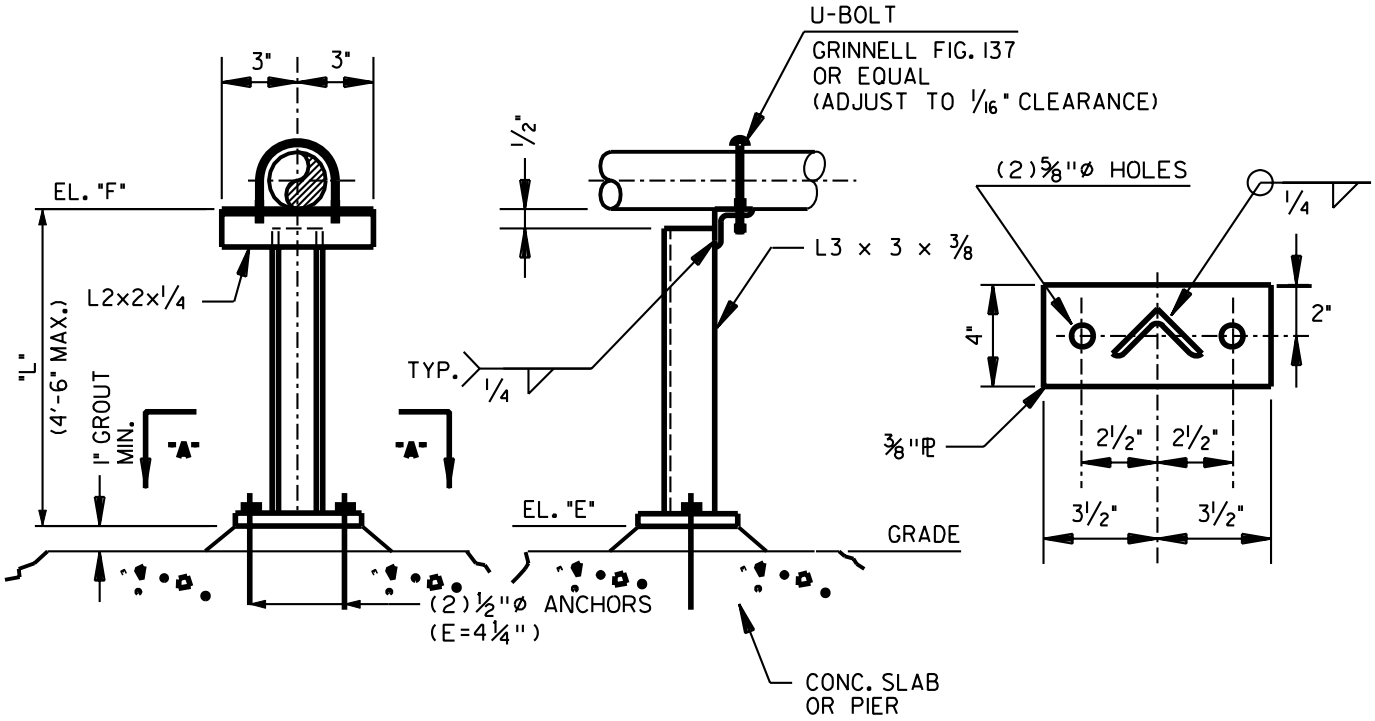
SECTION "B-B"



SECTION "A-A"

PS-2

USE UP TO 2" MAX. PIPE SIZE
EITHER DIMENSION "L" OR ELEVATIONS "E" & "F" ARE REQUIRED ON PIPING DRAWING

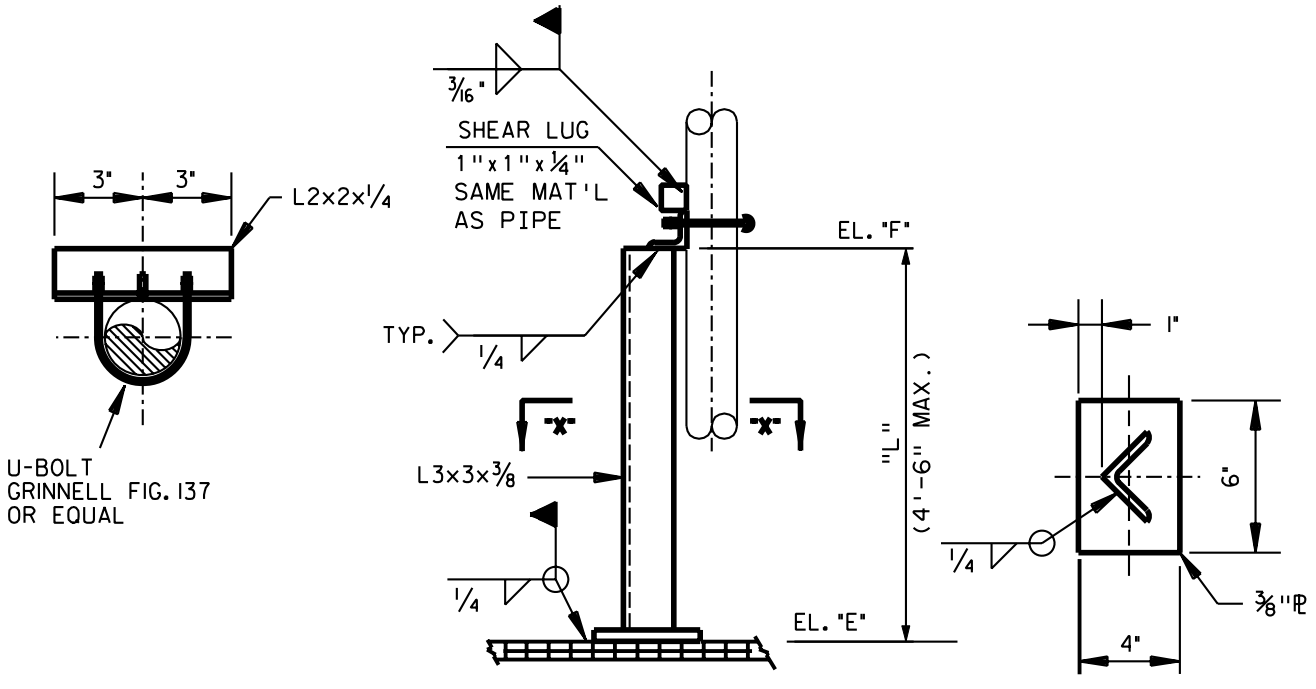


ELEVATION

SECTION "A-A"

PS-3

USE UP TO 2" MAX. PIPE SIZE (LOAD LIMIT 125 lbs.)
EITHER DIMENSION "L" OR ELEVATIONS "E" & "F" ARE REQUIRED ON PIPING DRAWING



PLAN

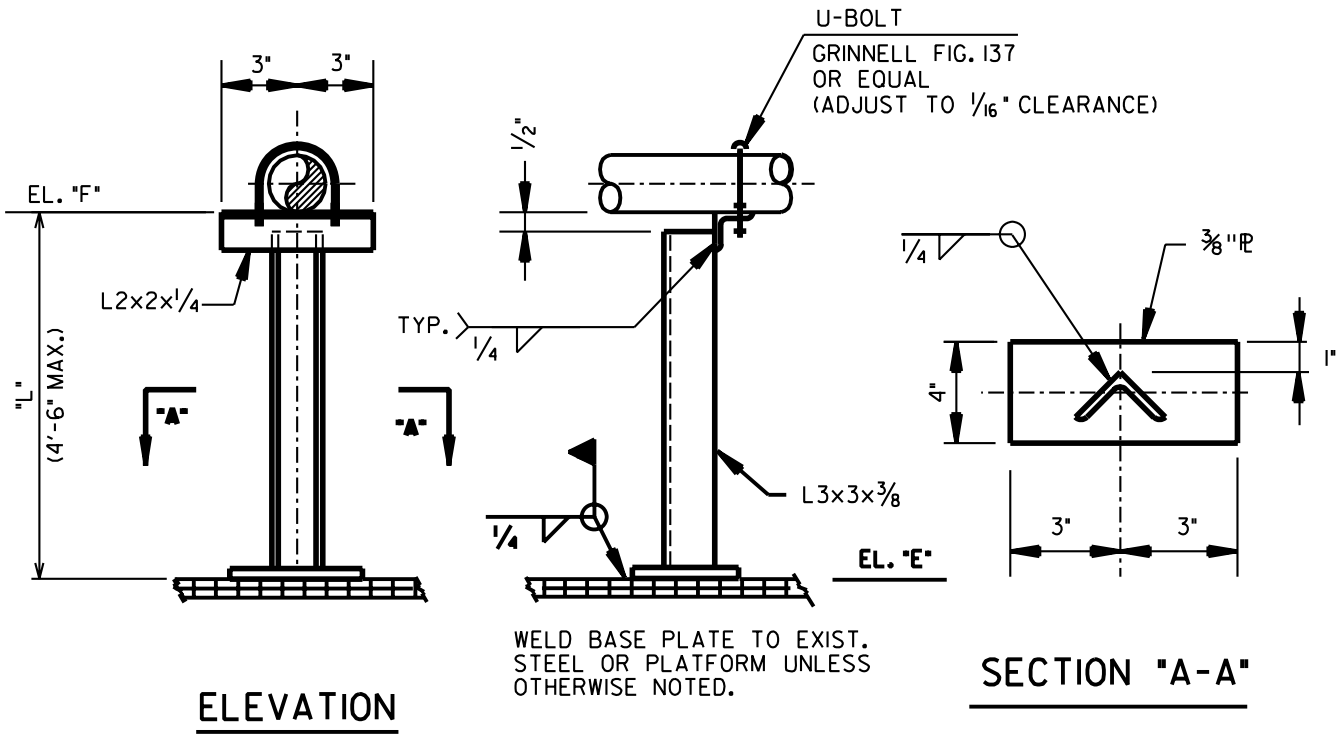
WELD BASE PLATE TO EXIST.
STEEL OR PLATFORM UNLESS
OTHERWISE NOTED.

ELEVATION

SECTION "X-X"

PS-4

USE UP TO 2" MAX. PIPE SIZE (LOAD LIMIT 125 lbs.)
EITHER DIMENSION "L" OR ELEVATIONS "E" & "F" ARE REQUIRED ON PIPING DRAWING

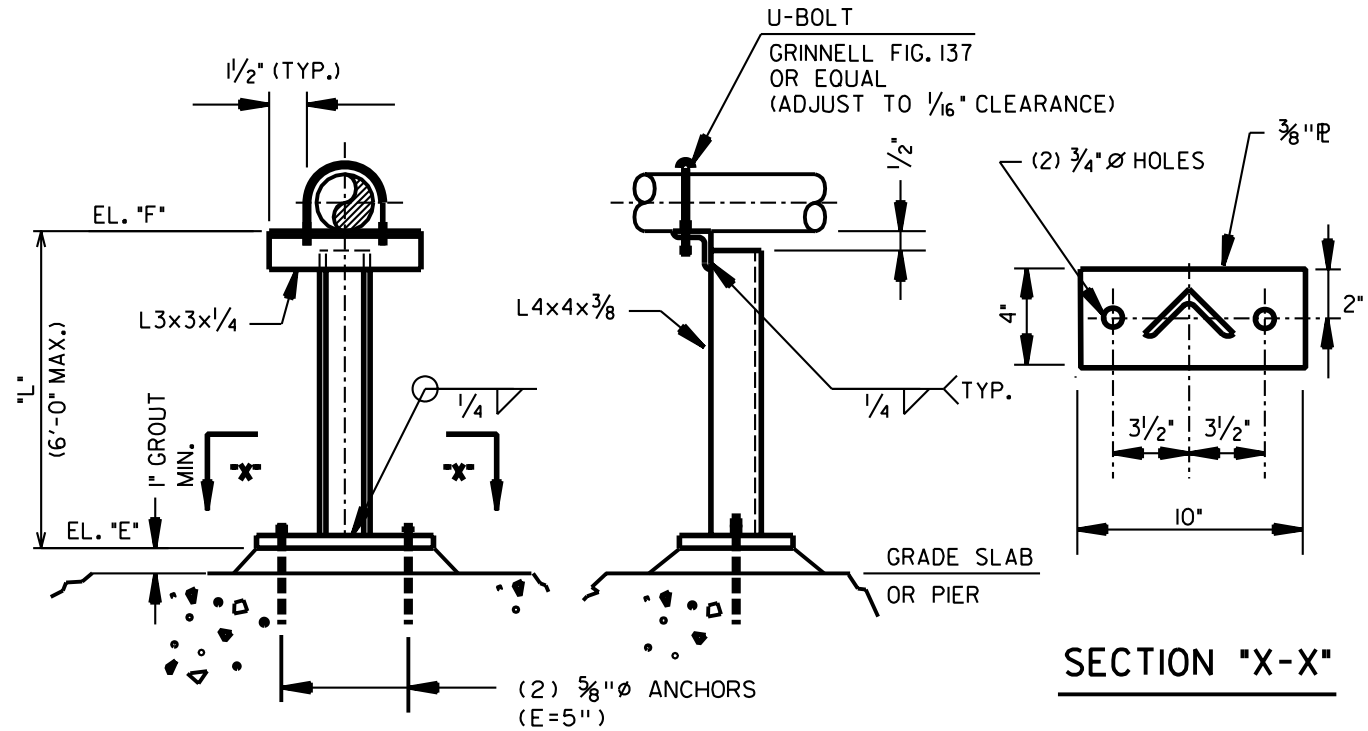


ELEVATION

SECTION "A-A"

PS-5

USE UP TO 2" MAX. PIPE SIZE (LOAD LIMIT 125 lbs. SEE SECTION 10.2)
EITHER DIMENSION "L" OR ELEVATIONS "E" & "F" ARE REQUIRED ON PIPING DRAWING

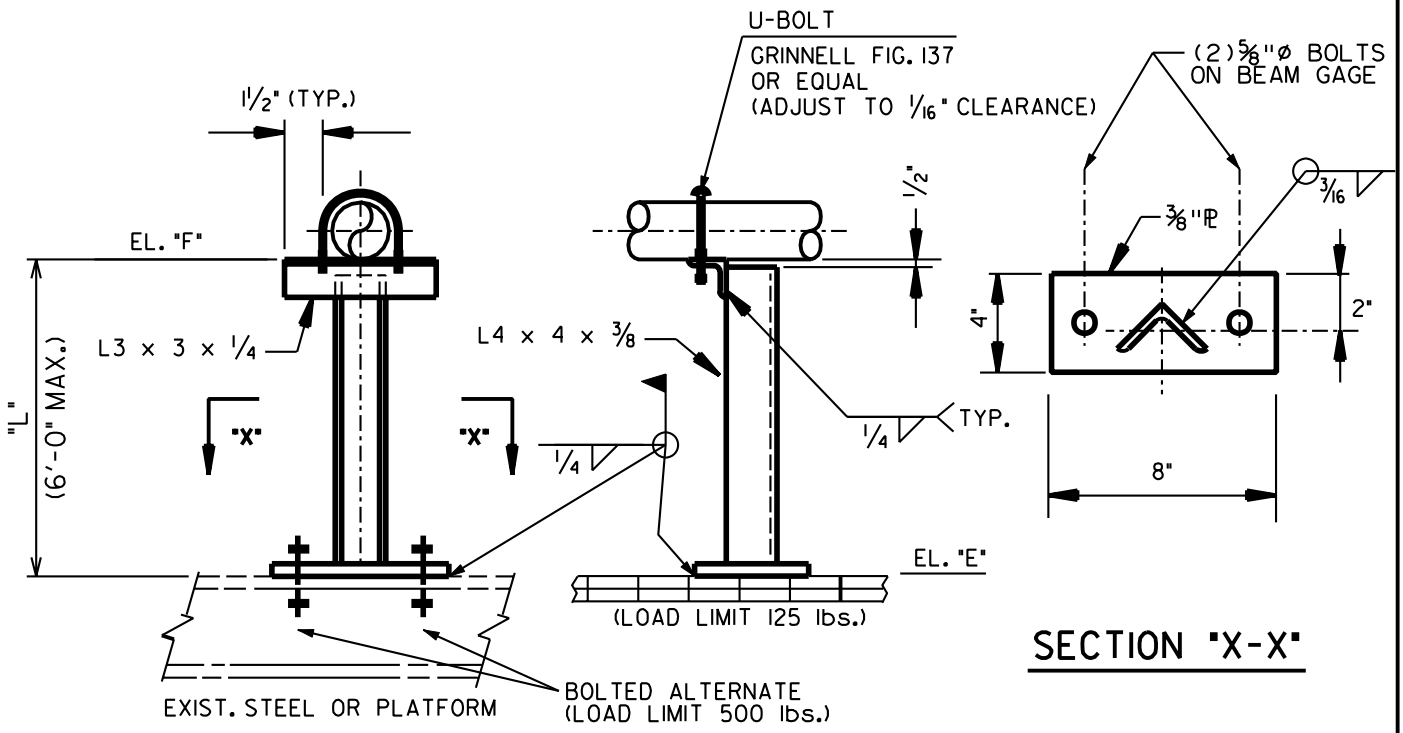


ELEVATION

SECTION "X-X"

PS-6

FOR 3" & 4" PIPE (LOAD LIMIT 500 lbs. SEE SECTION 10.2)
EITHER DIMENSION "L" OR ELEVATIONS "E" & "F" ARE REQUIRED ON PIPING DRAWING

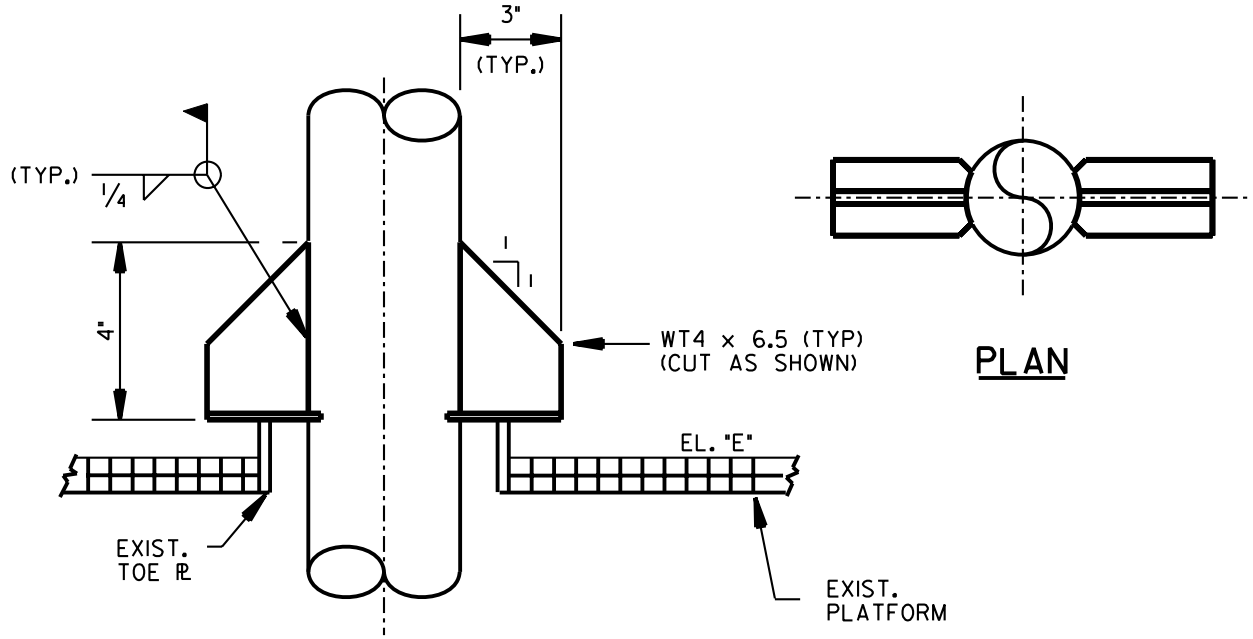


SECTION "X-X"

ELEVATION
(LOAD LIMIT 500 lbs.)

PS-7

FOR 3" & 4" PIPE (LOAD LIMIT AS NOTED SEE SECTION 10.2)
EITHER DIMENSION "L" OR ELEVATIONS "E" & "F" ARE REQUIRED ON PIPING DRAWING

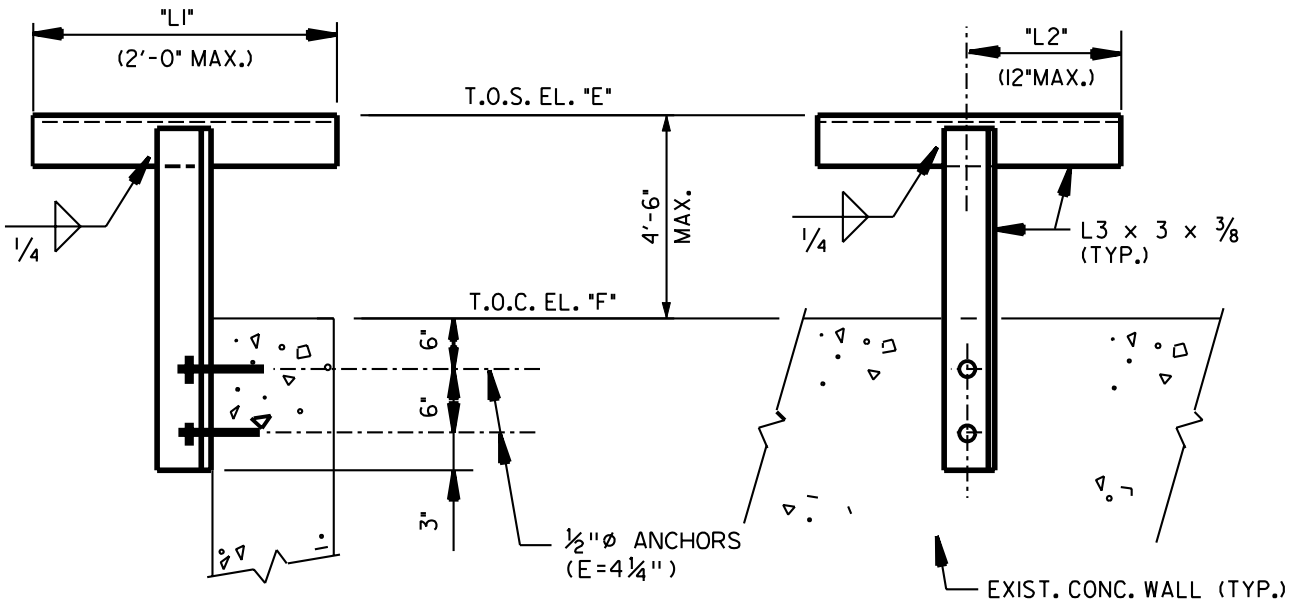


PLAN

ELEVATION

NOTE: SUPPORT TO REST ON
PLATFORM OR ON TOE PL

PS-8
(LOAD LIMIT 250 lbs.
SEE SECTION 10.2)

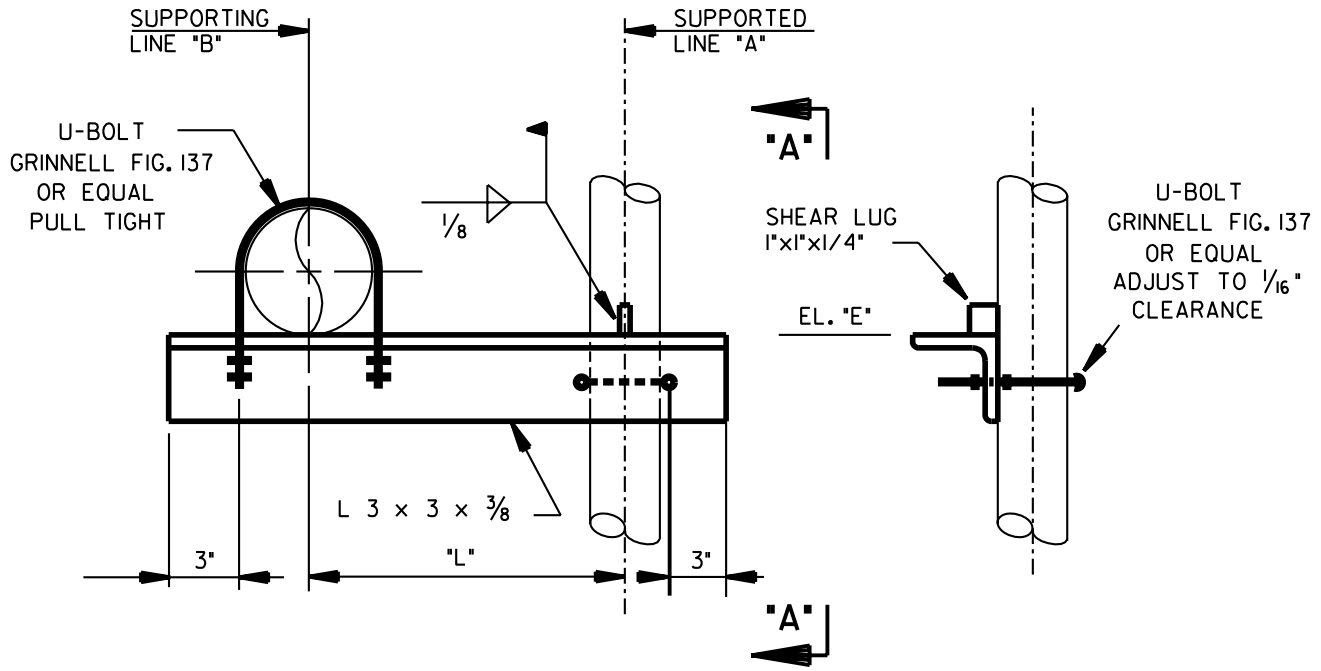


ELEVATION TYPE I

ELEVATION TYPE II

PS-9

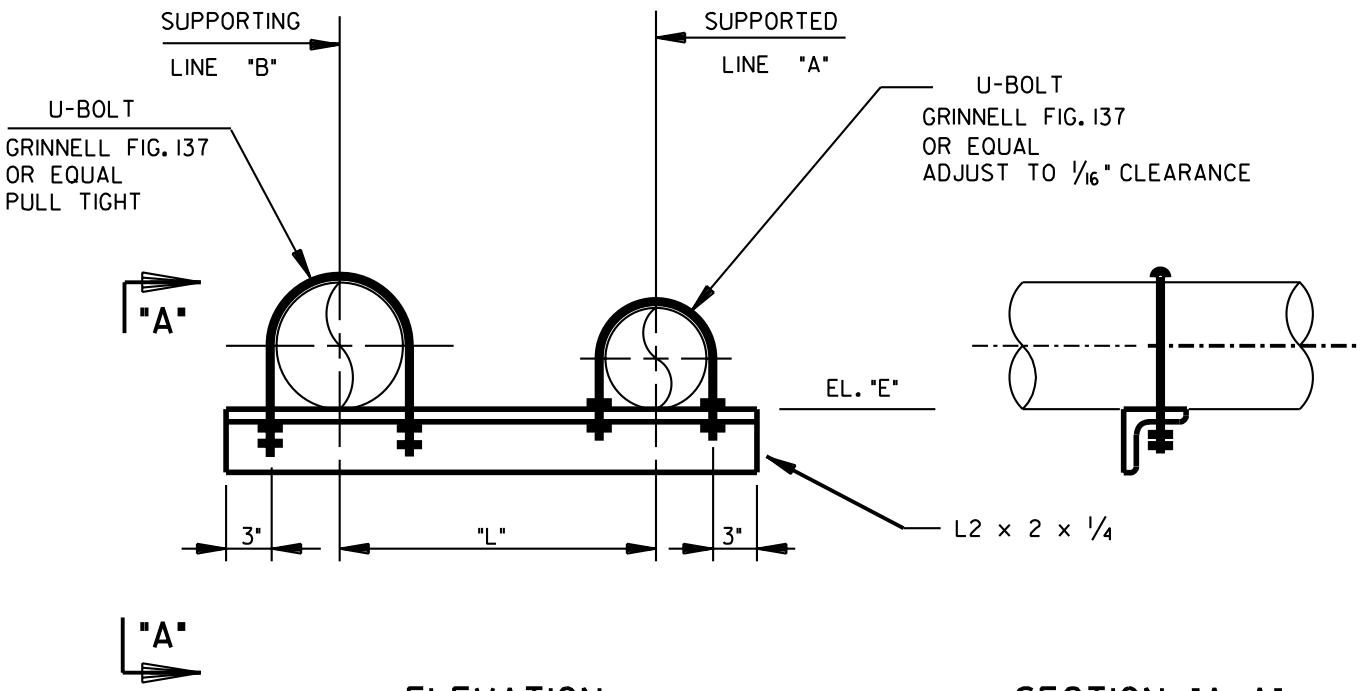
(LOAD LIMIT 500 lbs. VERTICAL LOAD
AND 250 lbs. HORIZONTAL (WIND) LOAD
SEE SECTION 10.2)



ELEVATION

SECTION "A-A"

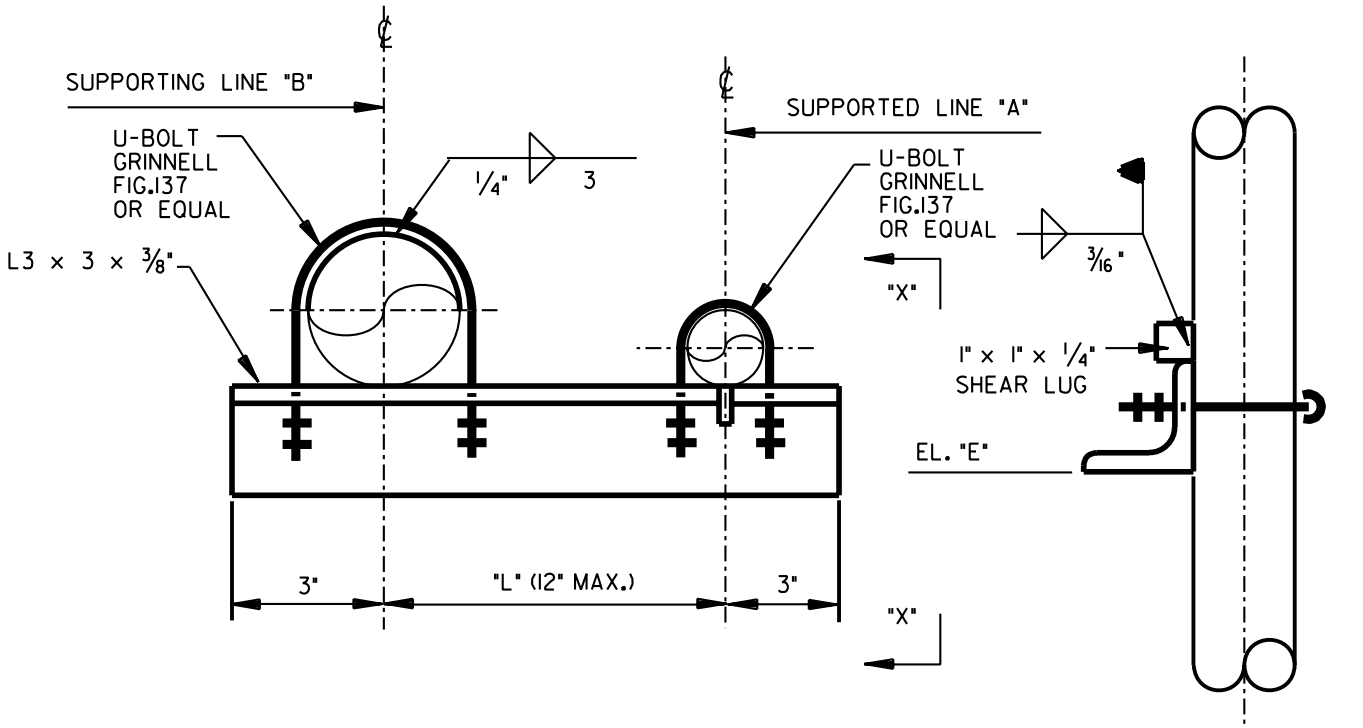
PS-10



ELEVATION

SECTION "A-A"

PS-II

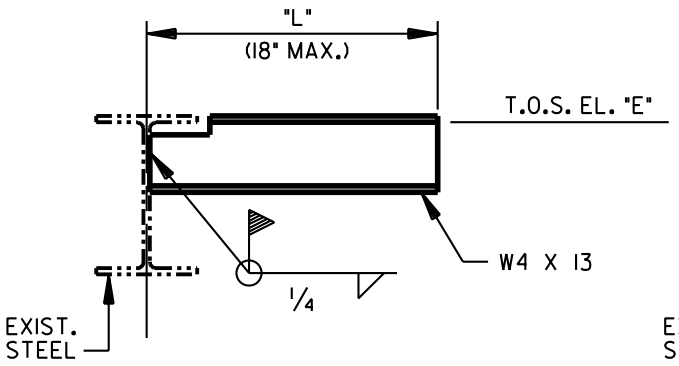


PLAN

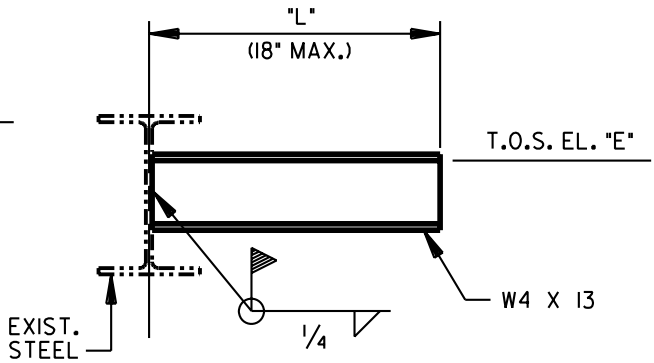
SECTION "X-X"

PS-12

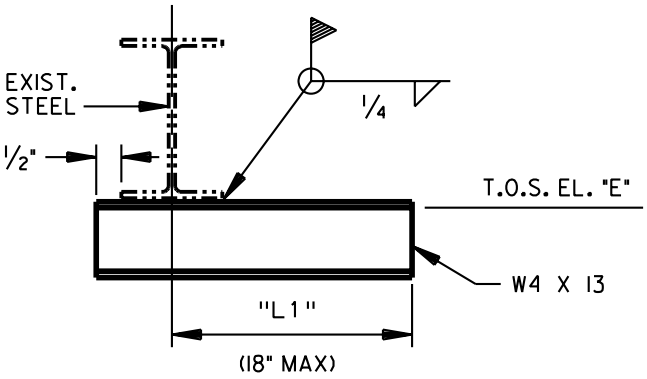
NOTE: COPE W4 AS SHOWN



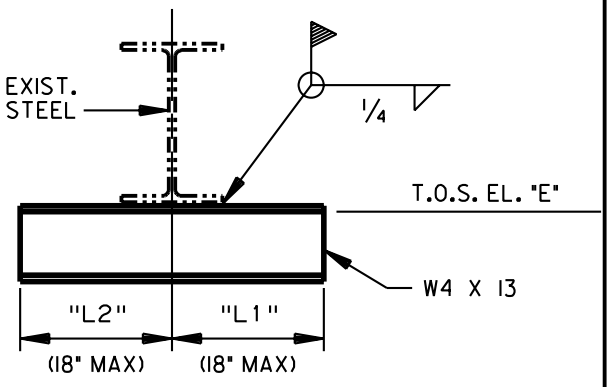
ELEVATION TYPE I



ELEVATION TYPE III



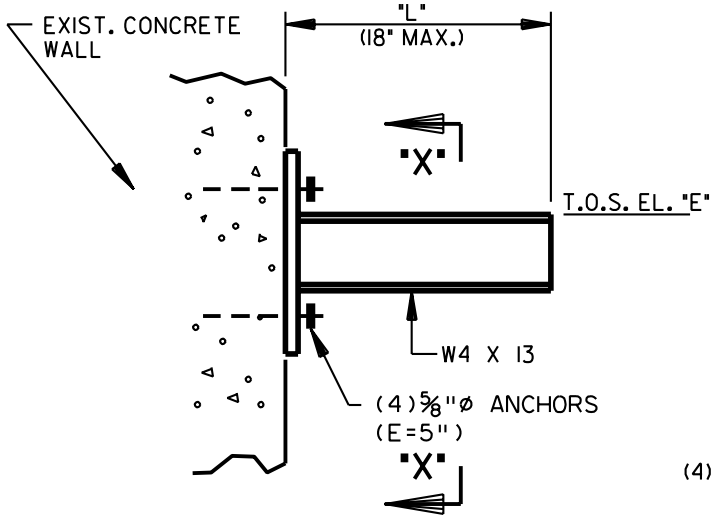
ELEVATION TYPE II



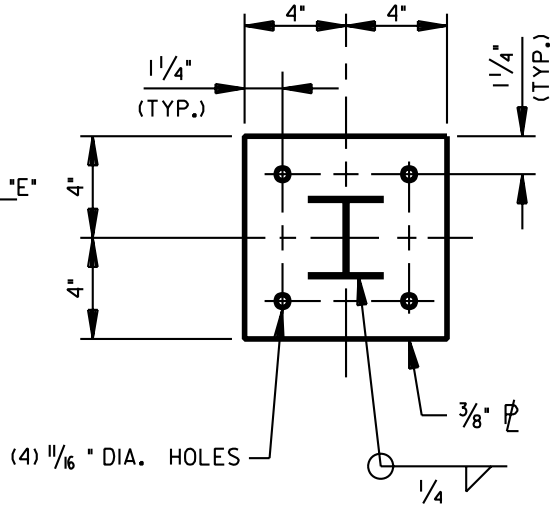
ELEVATION TYPE IV

PS-13

LOAD LIMIT 500 lbs.
SEE SECTIONS 10.2 & 10.6



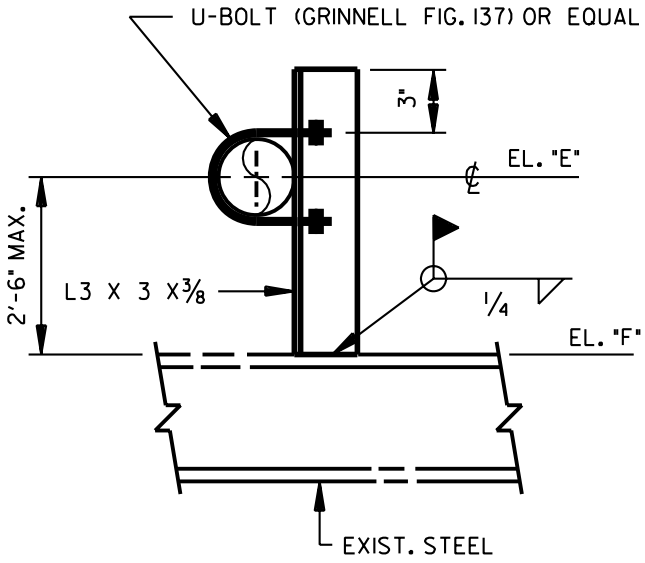
ELEVATION

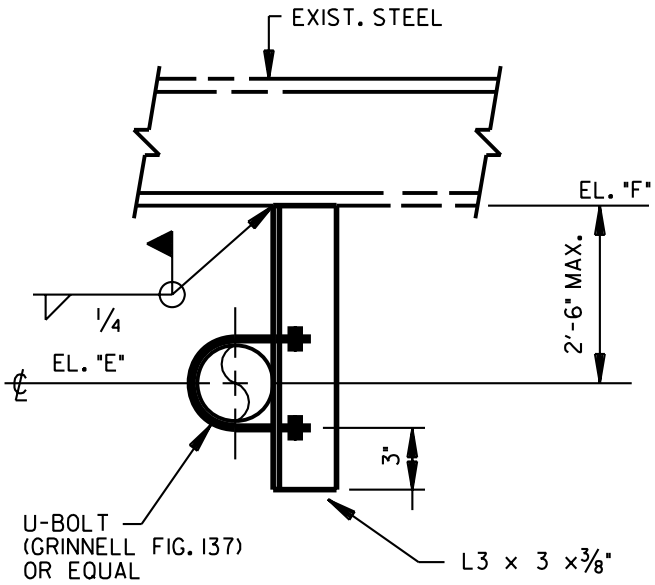


SECTION 'X-X'

PS-14

LOAD LIMIT 2000 lbs. TOTAL
SEE SECTION 10.2



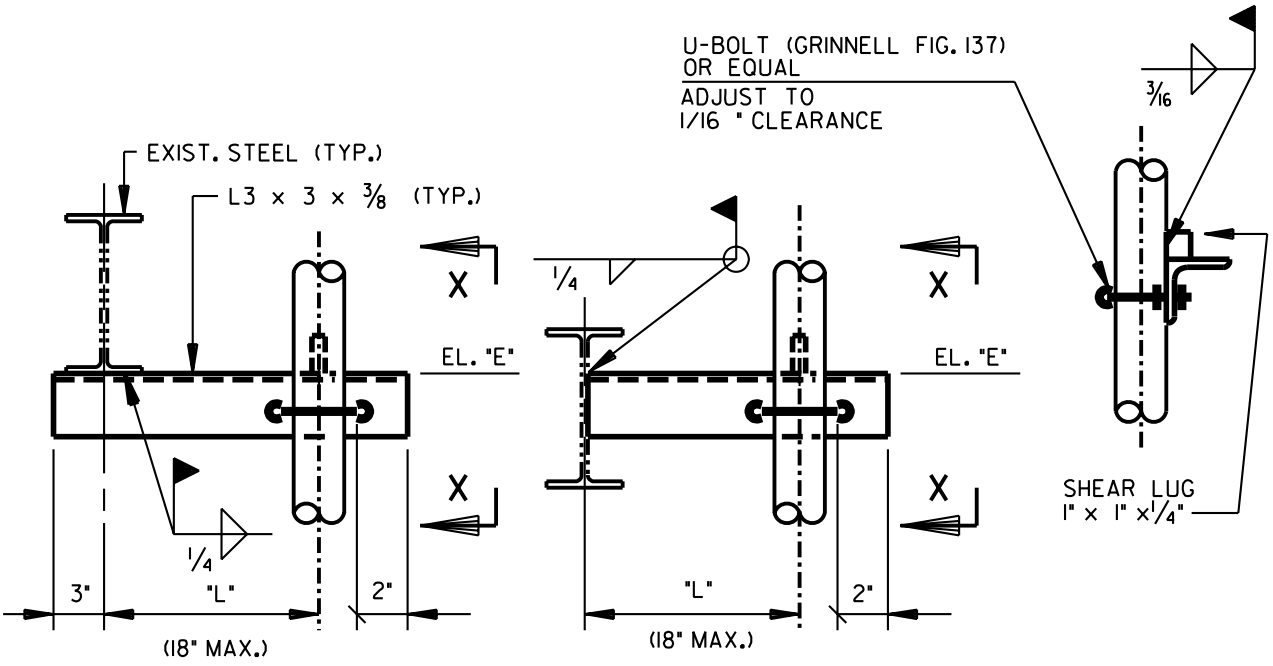


ELEVATION TYPE I

ELEVATION TYPE II

PS-15

(SEE SECTIONS 10.2 & 10.6)



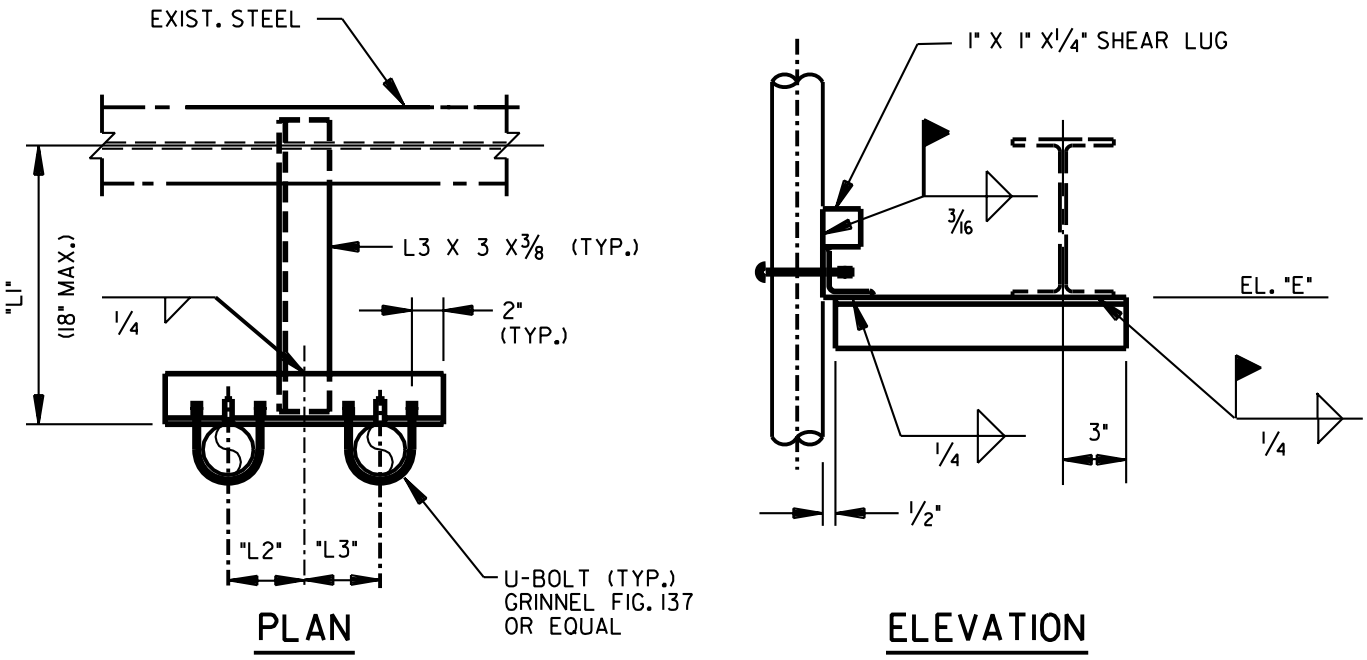
ELEVATION TYPE I

ELEVATION TYPE II

SECTION X-X

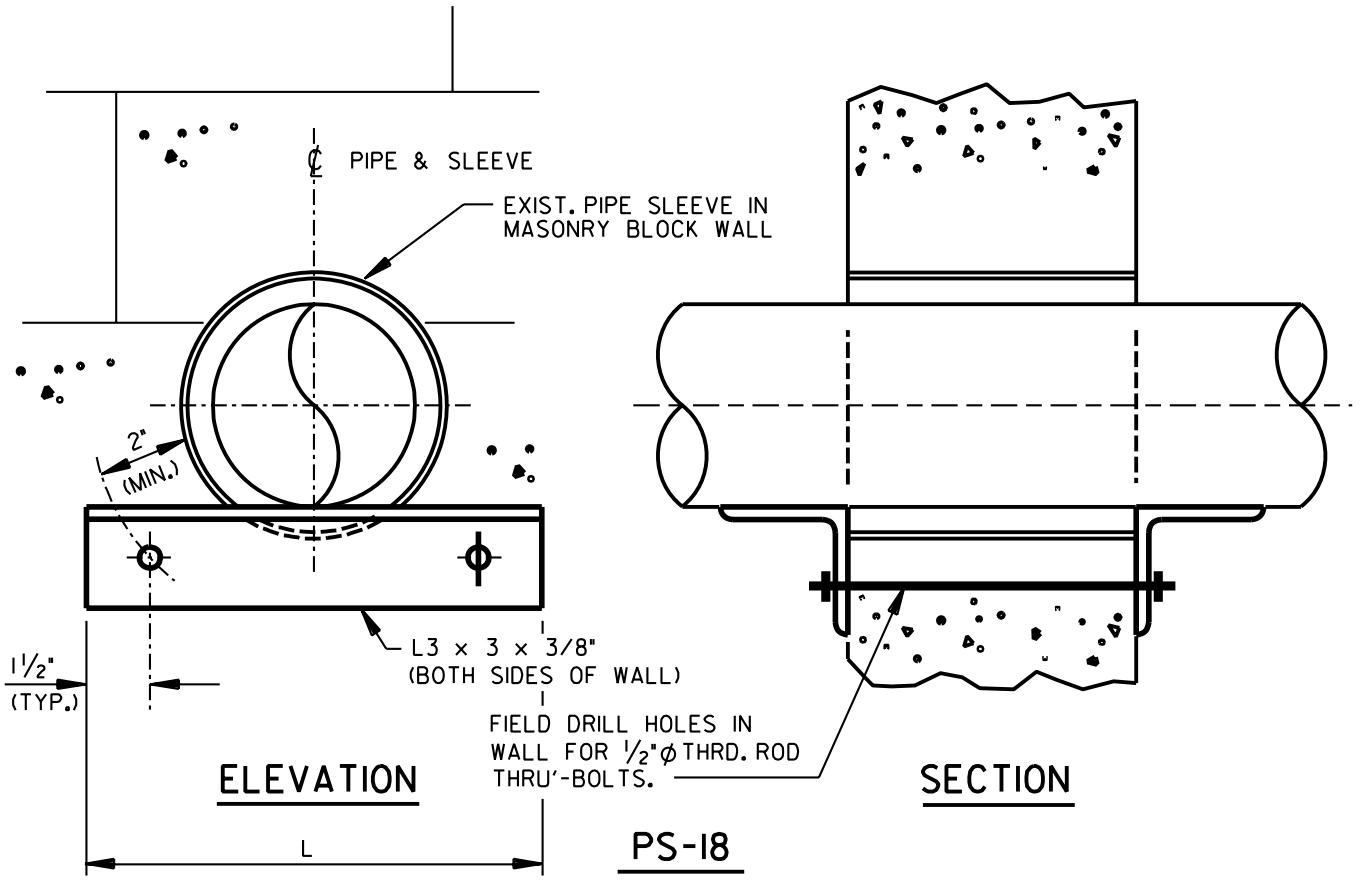
PS-16

(LOAD LIMIT 250 lbs.)
(SEE SECTIONS 10.2 & 10.6)



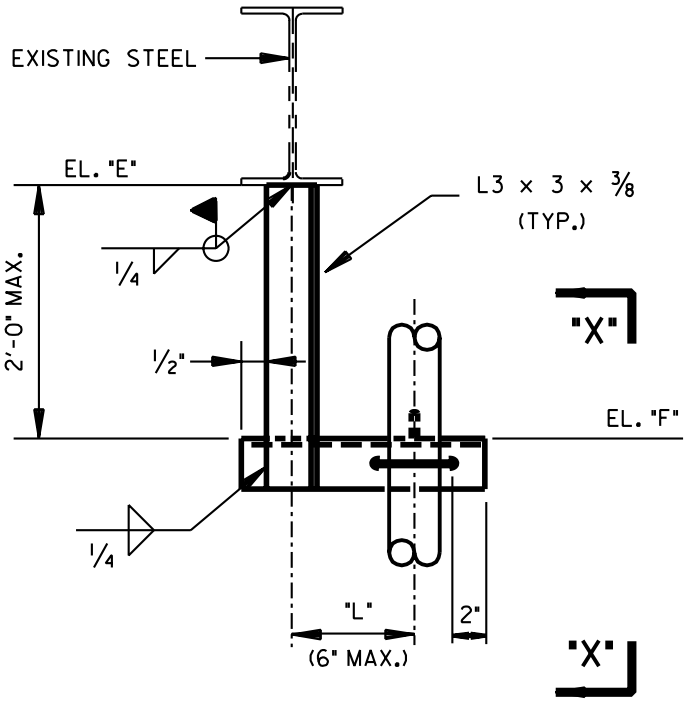
PS-17

LOAD LIMIT 250 lbs.
SEE SECTIONS 10.2 & 10.6)

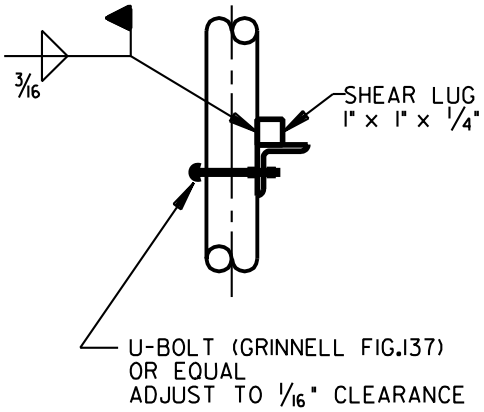


PS-18

(LOAD LIMIT 1000 lbs. TOTAL
SEE SECTION 10.2)



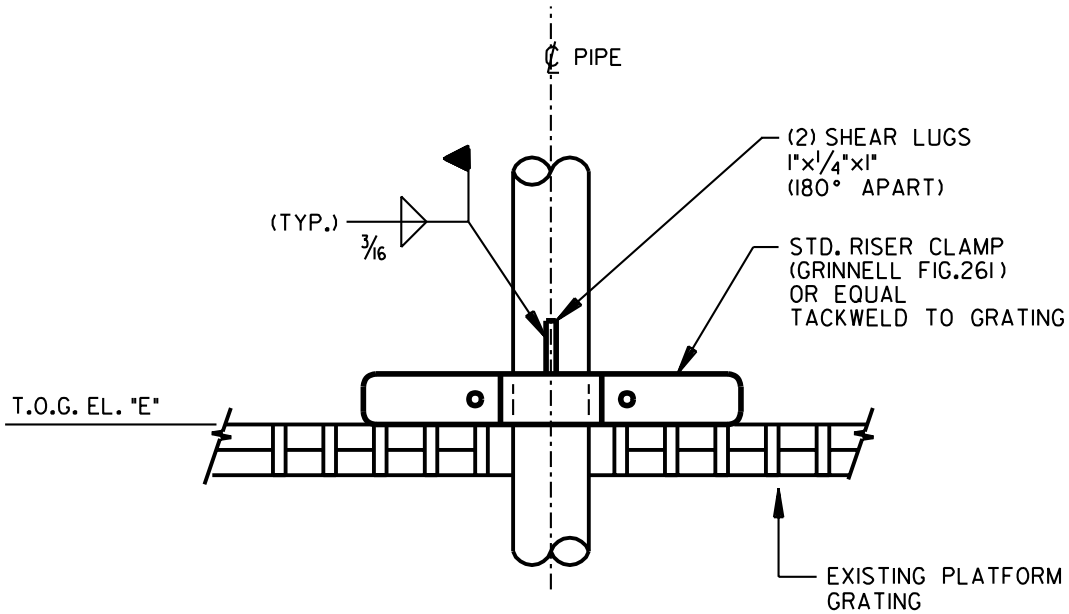
ELEVATION



SECTION "X-X"

PS-19

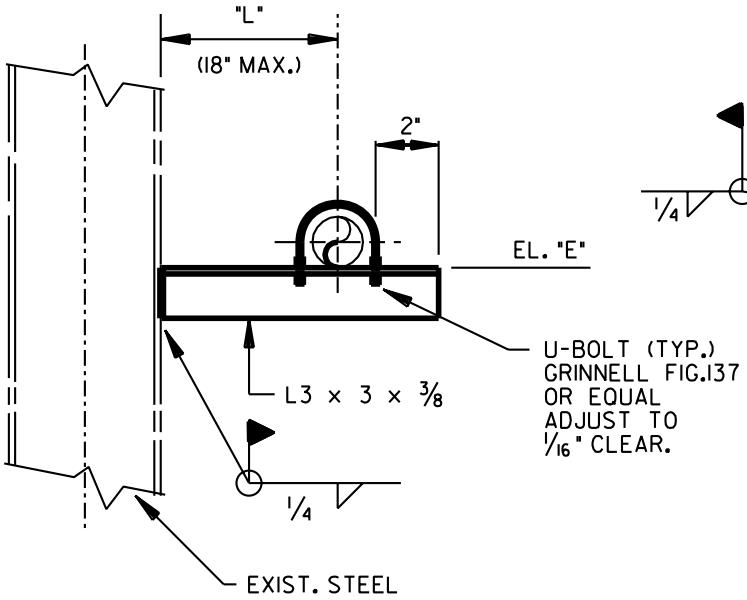
(LOAD LIMIT 250 lbs.
SEE SECTIONS 10.2 & 10.6)



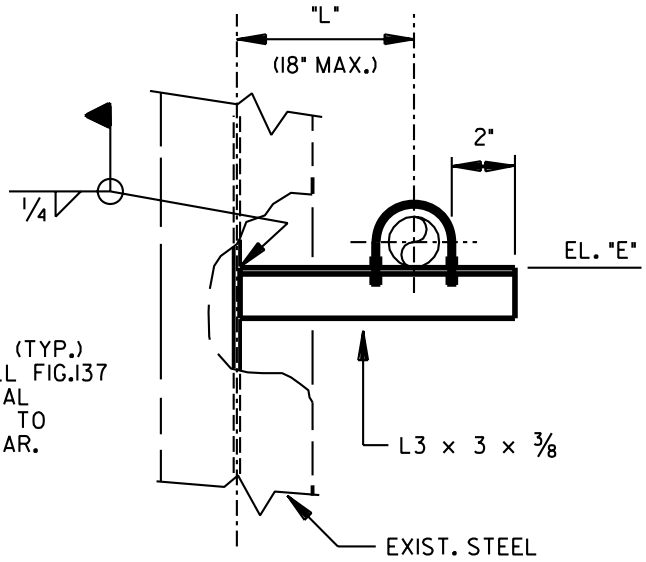
ELEVATION

PS-20

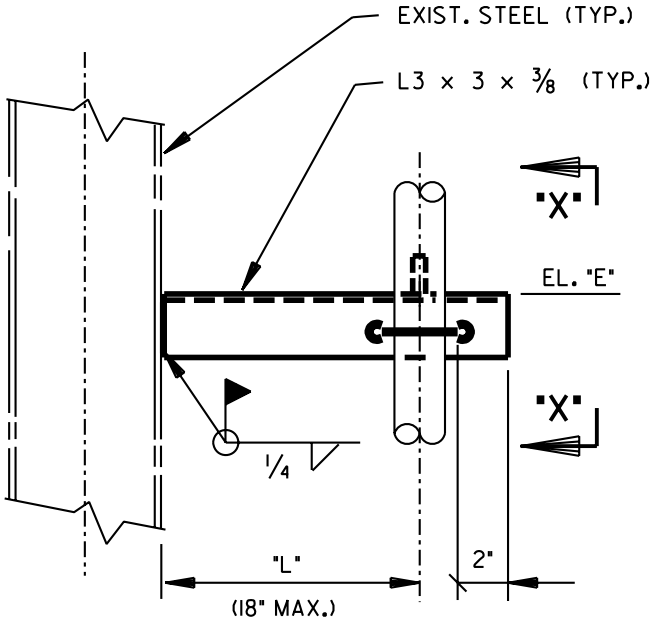
(LOAD LIMIT 250 lbs. TOTAL
SEE SECTION 10.2)



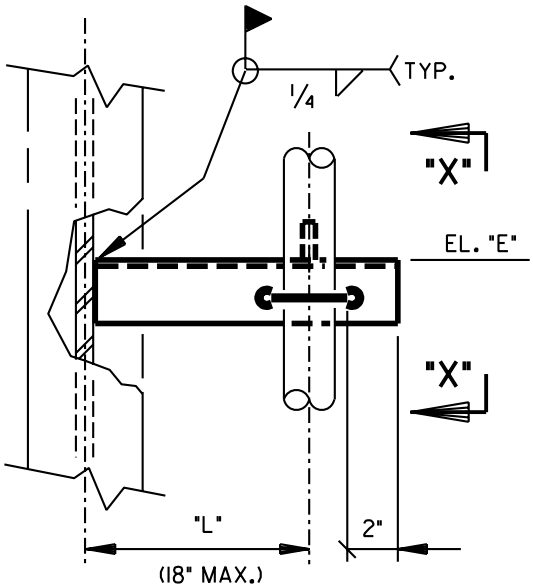
ELEVATION TYPE 1



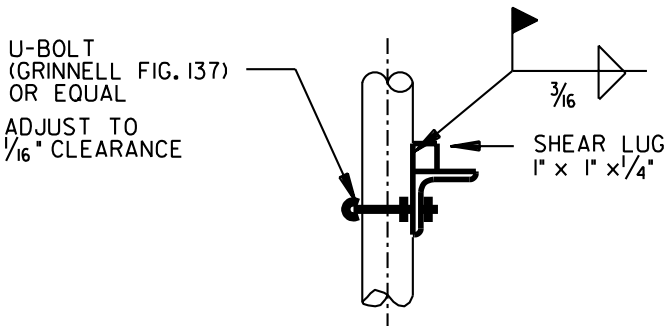
ELEVATION TYPE 2



ELEVATION TYPE 3



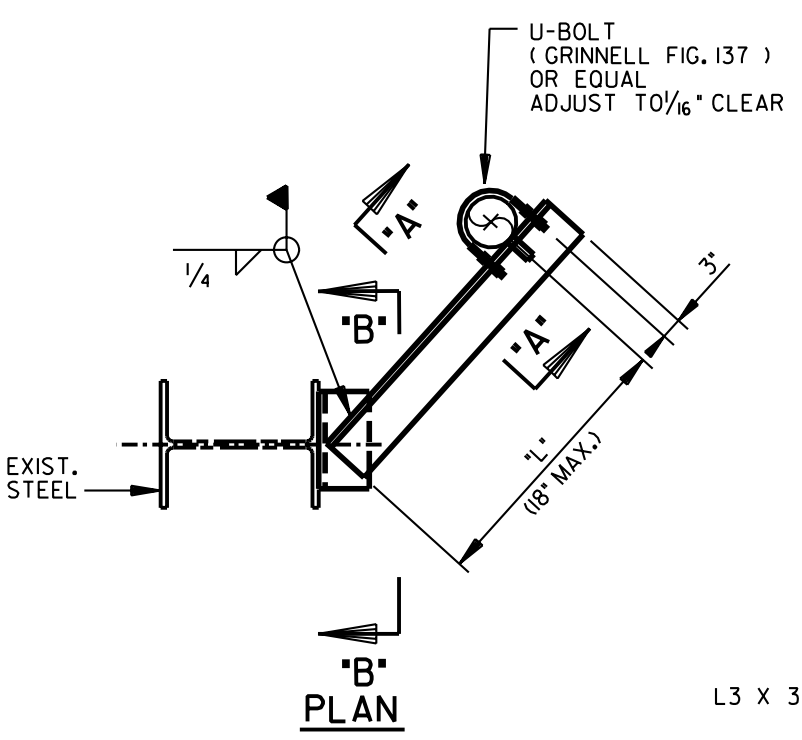
ELEVATION TYPE 4



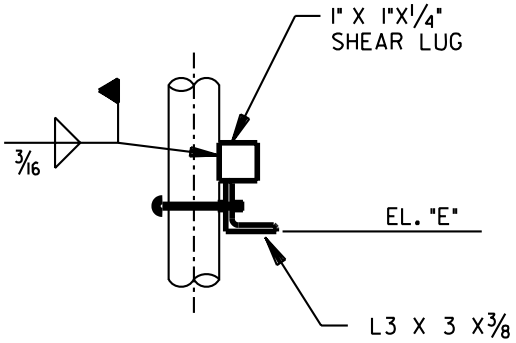
SECTION "X-X"

PS-21

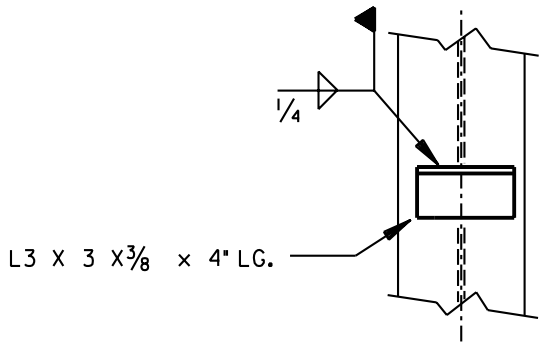
(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)



"B"
PLAN



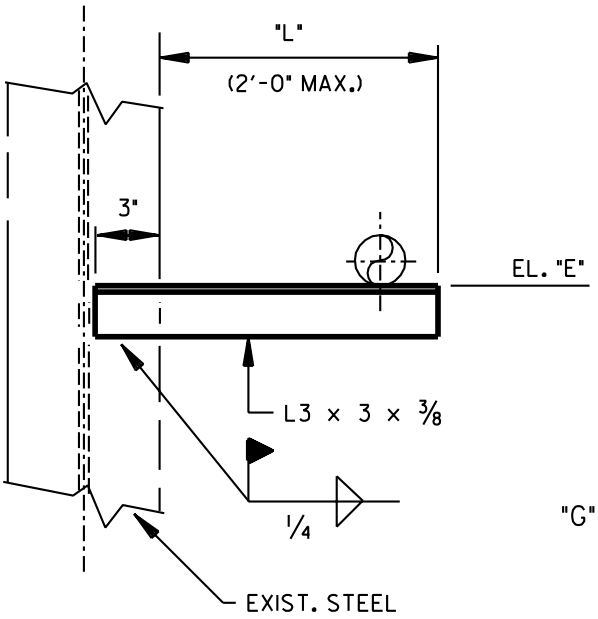
SECTION "A-A"



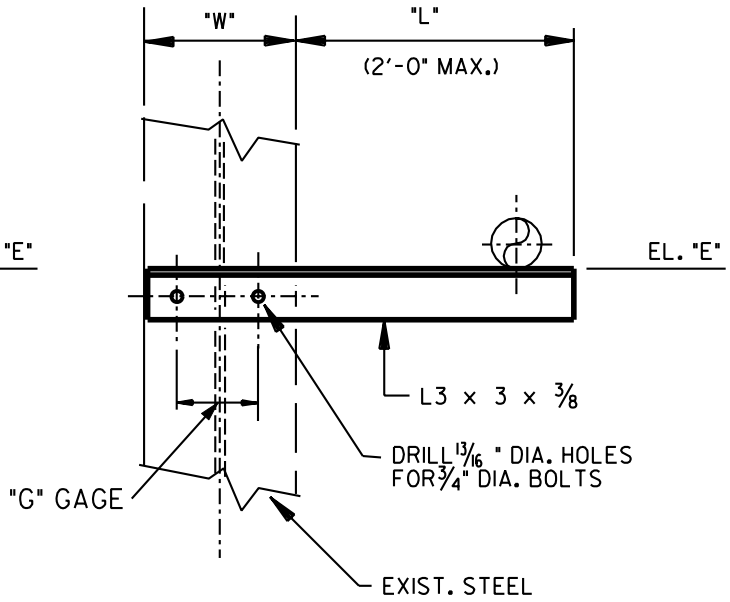
SECTION "B-B"

PS-22

(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)



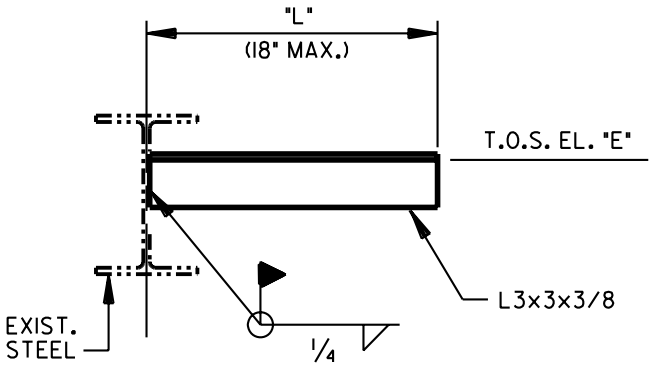
ELEVATION TYPE I



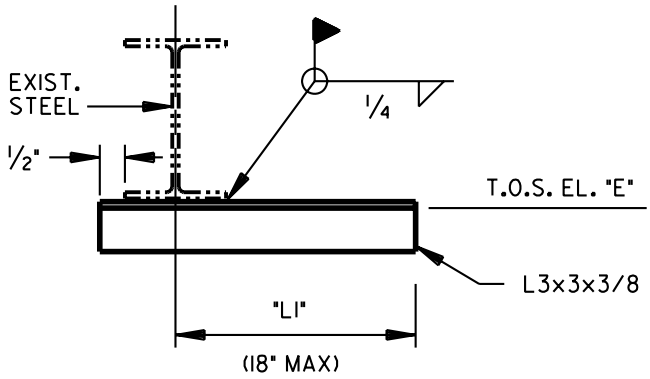
ELEVATION TYPE II

PS-23

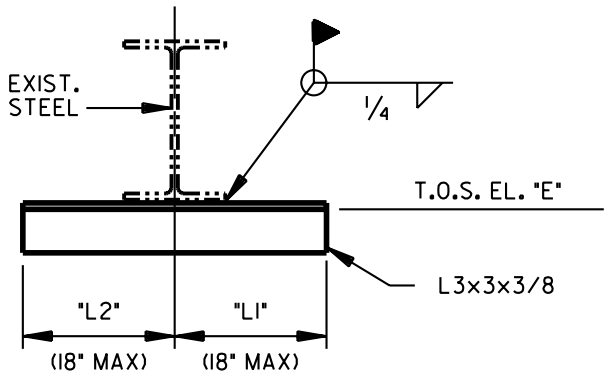
(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)



ELEVATION TYPE I



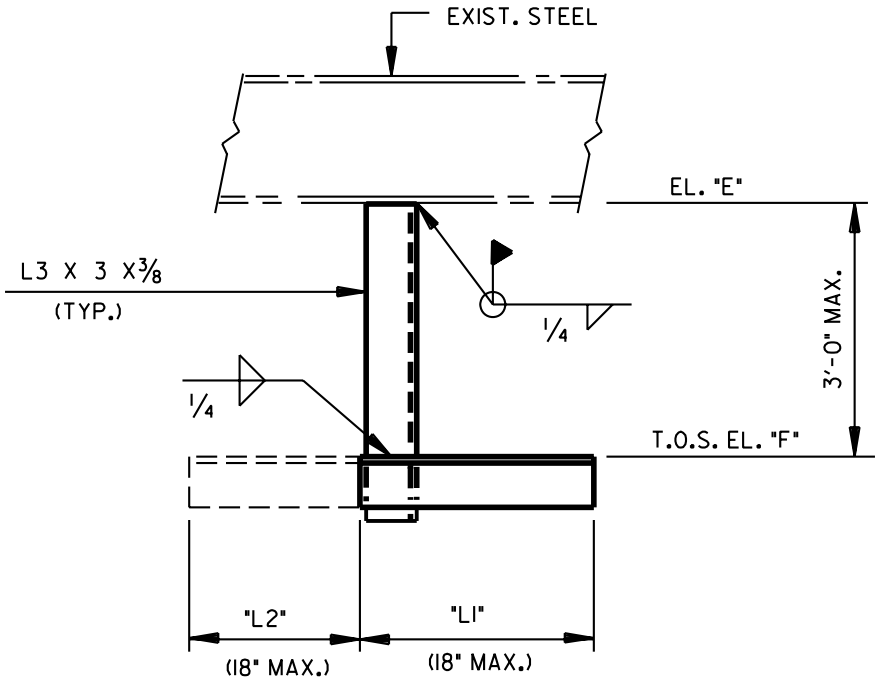
ELEVATION TYPE II



ELEVATION TYPE III

PS-24

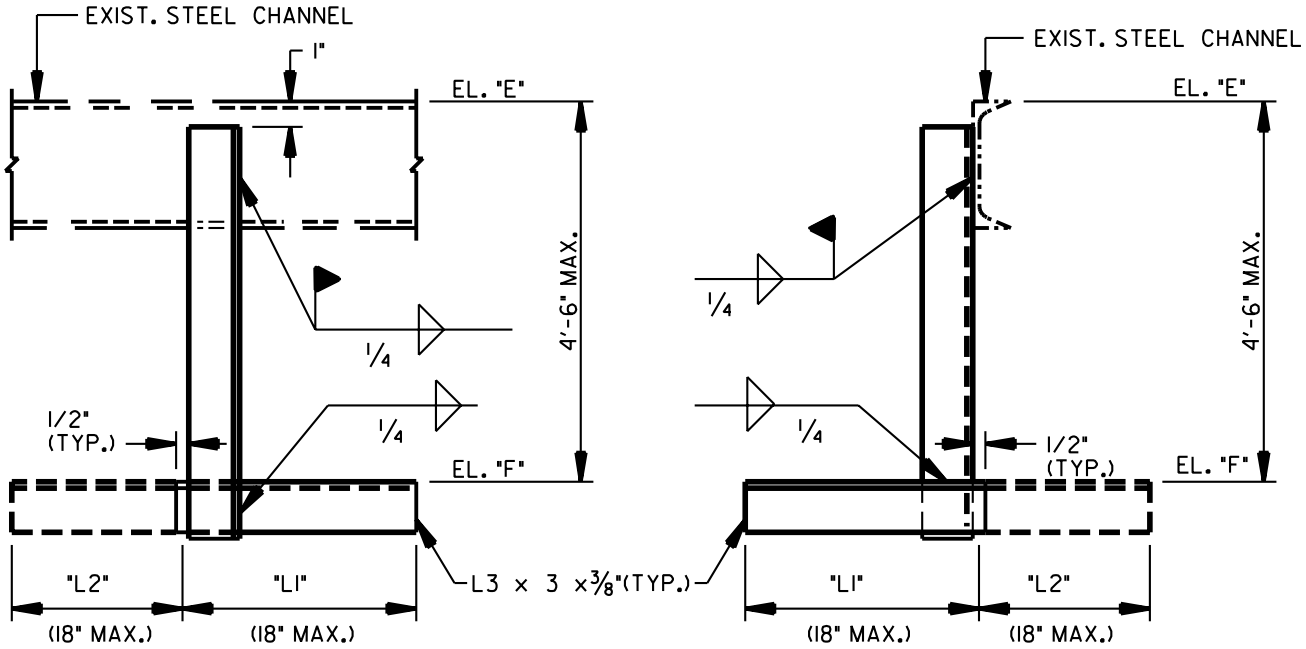
(LOAD LIMIT 250 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)



ELEVATION

PS-25

(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)

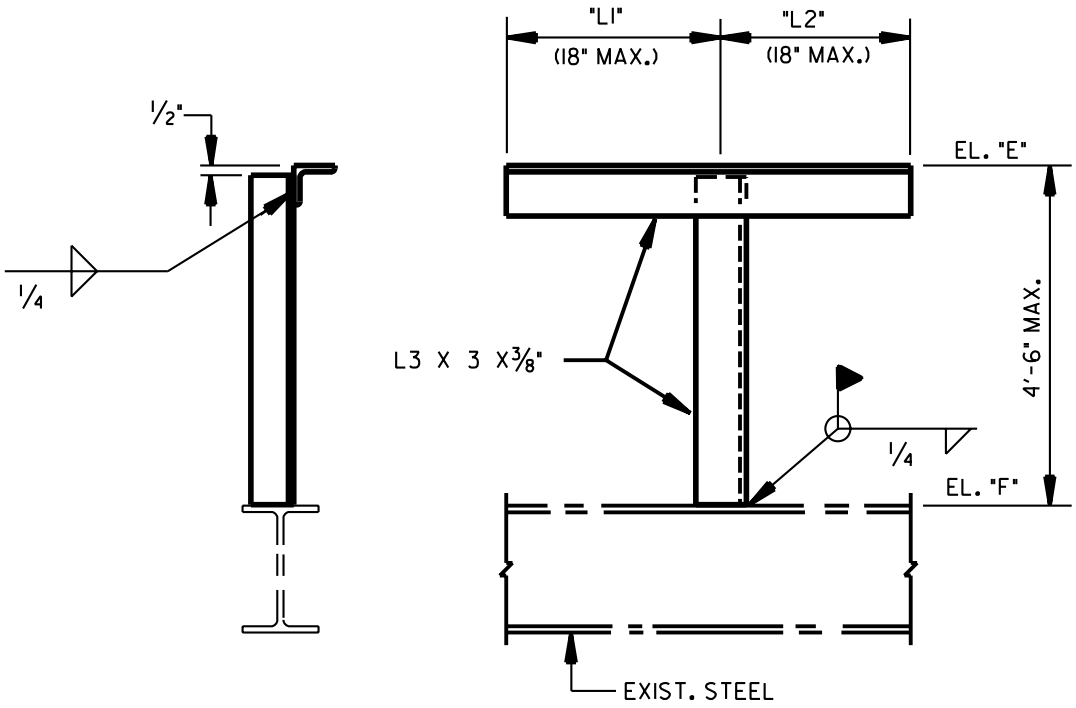


ELEVATION TYPE I

ELEVATION TYPE II

PS-26

(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)

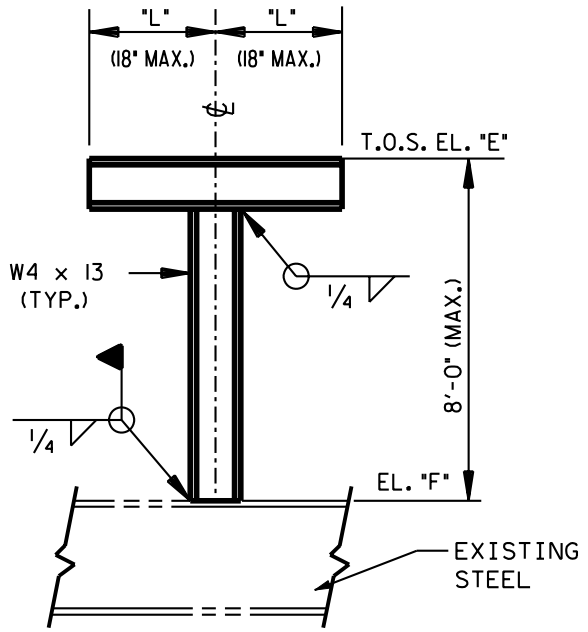


ELEVATION

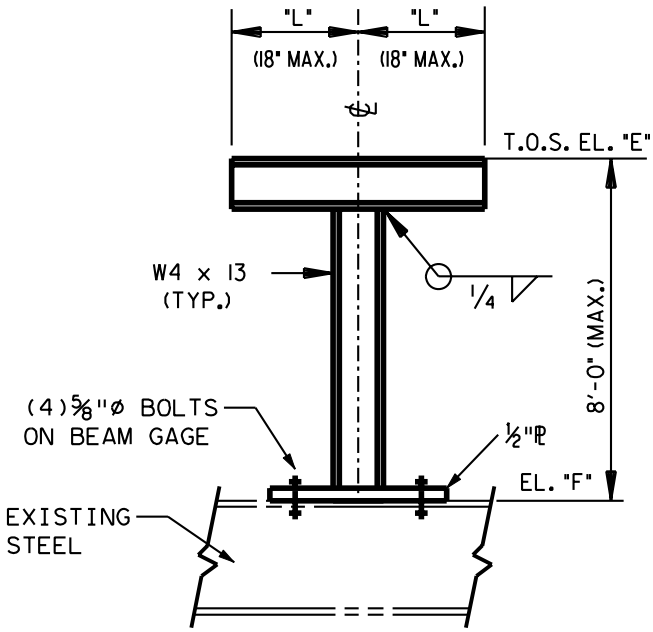
PS-27

(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)

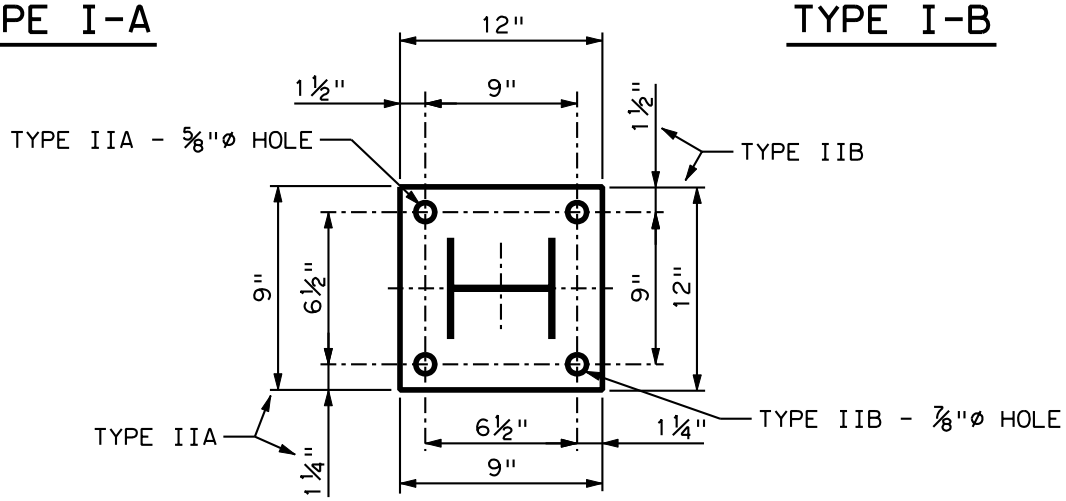
NOTE: SUPPORT MAY BE ROTATED FROM POSITION SHOWN.



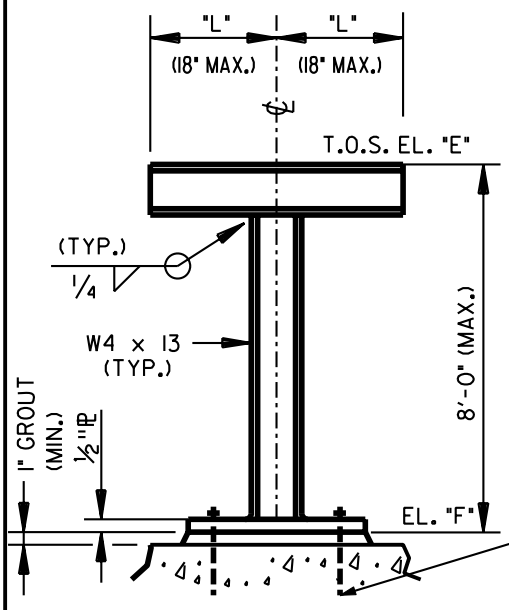
TYPE I-A



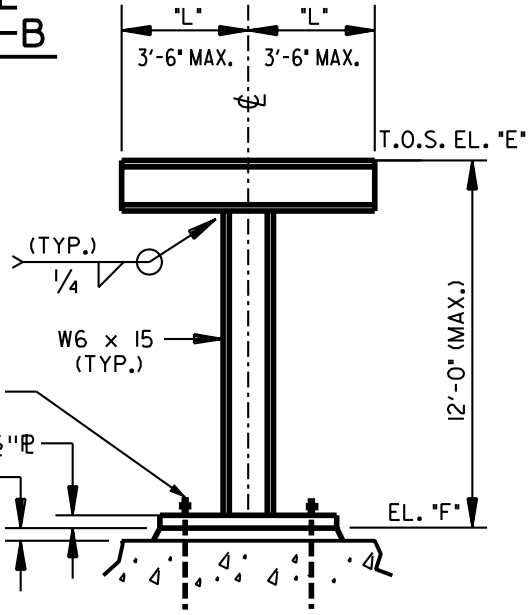
TYPE I-B



BASE PL DETAIL
FOR II-A & II-B



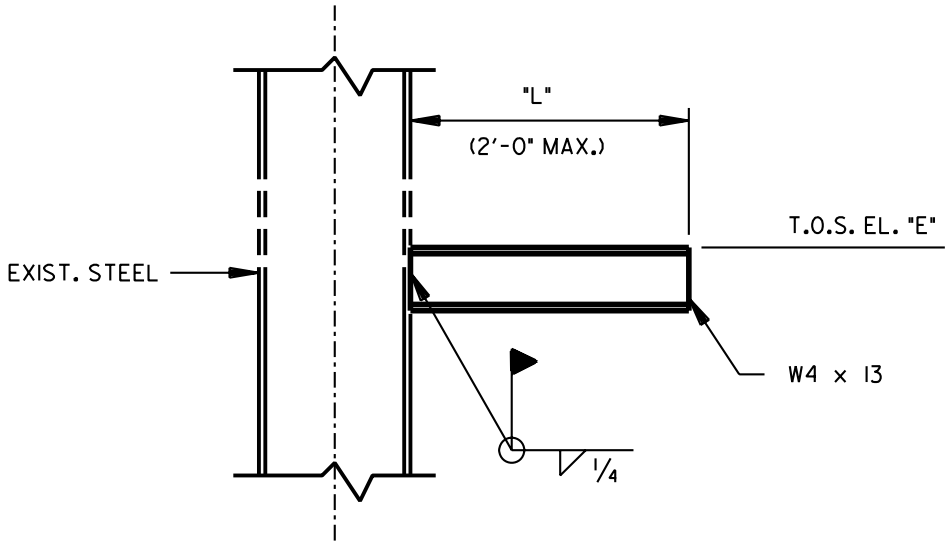
TYPE II-A



TYPE II-B

PS-28

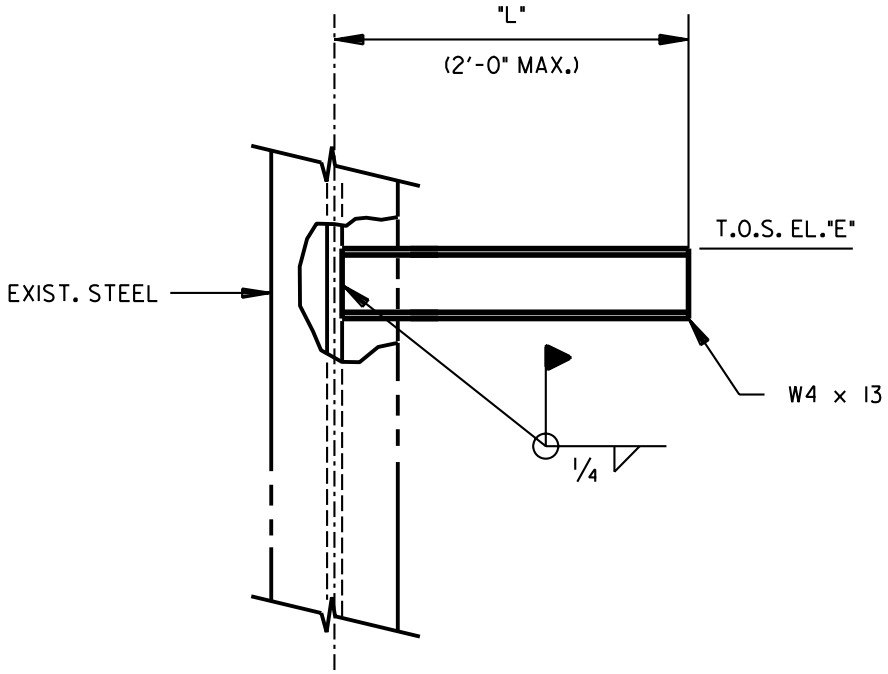
(LOAD LIMIT 2000 lbs. VERTICAL
AND 500 lbs. HORIZONTAL (WIND) LOAD
SEE SECTION 10.2)



ELEVATION

PS-29

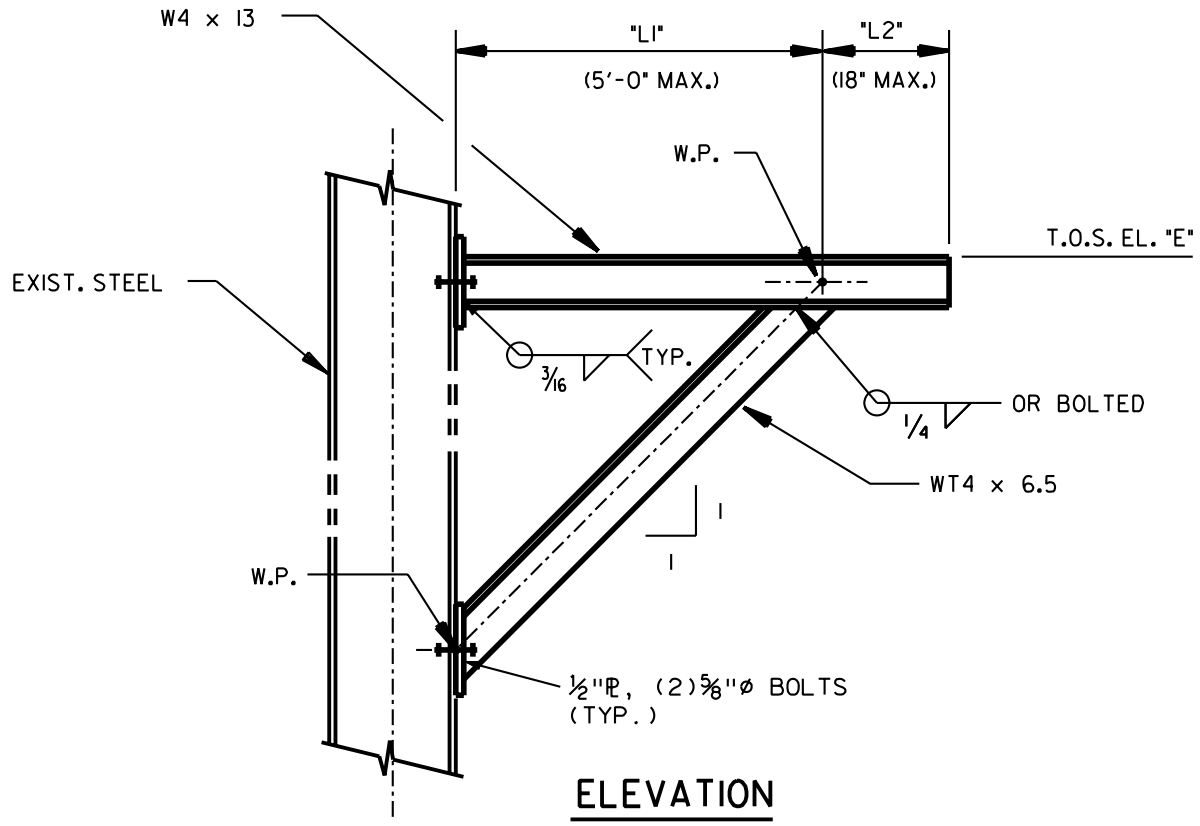
(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)



ELEVATION

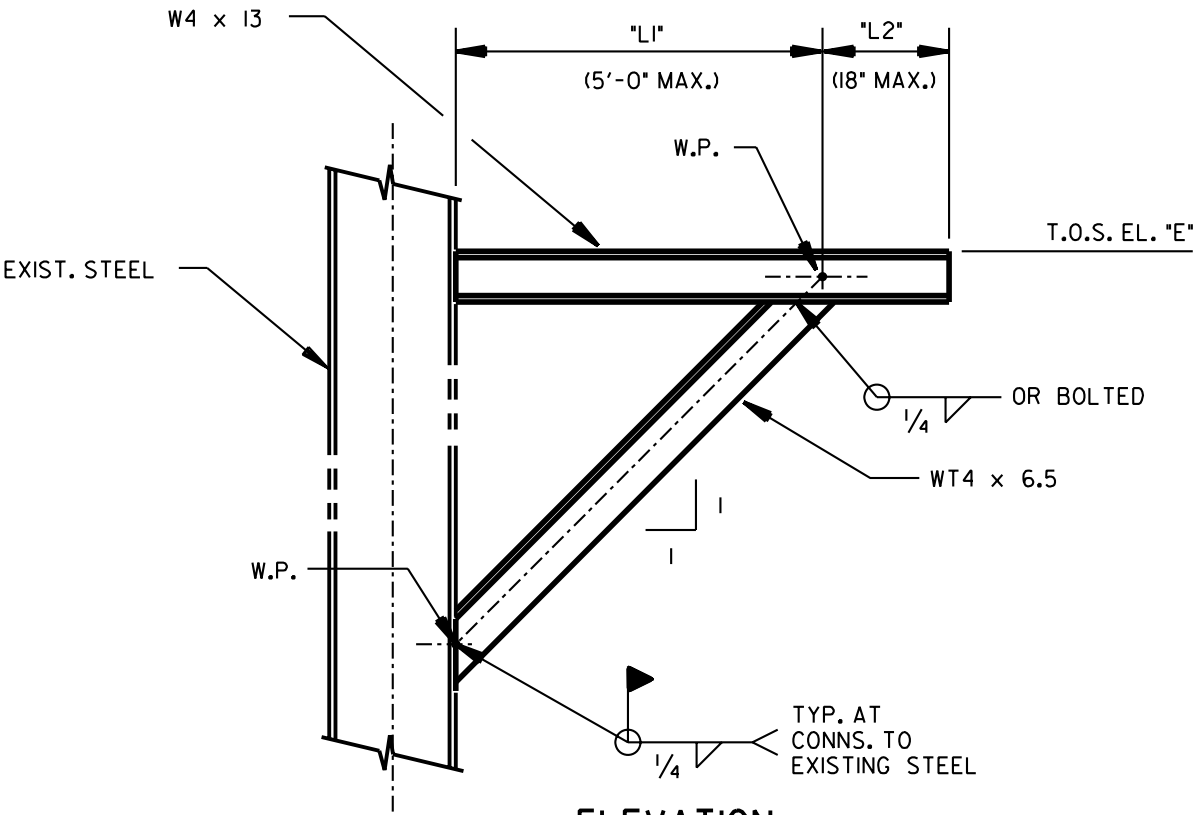
PS-30

(LOAD LIMIT 500 lbs. TOTAL
SEE SECTIONS 10.2 & 10.6)



ELEVATION

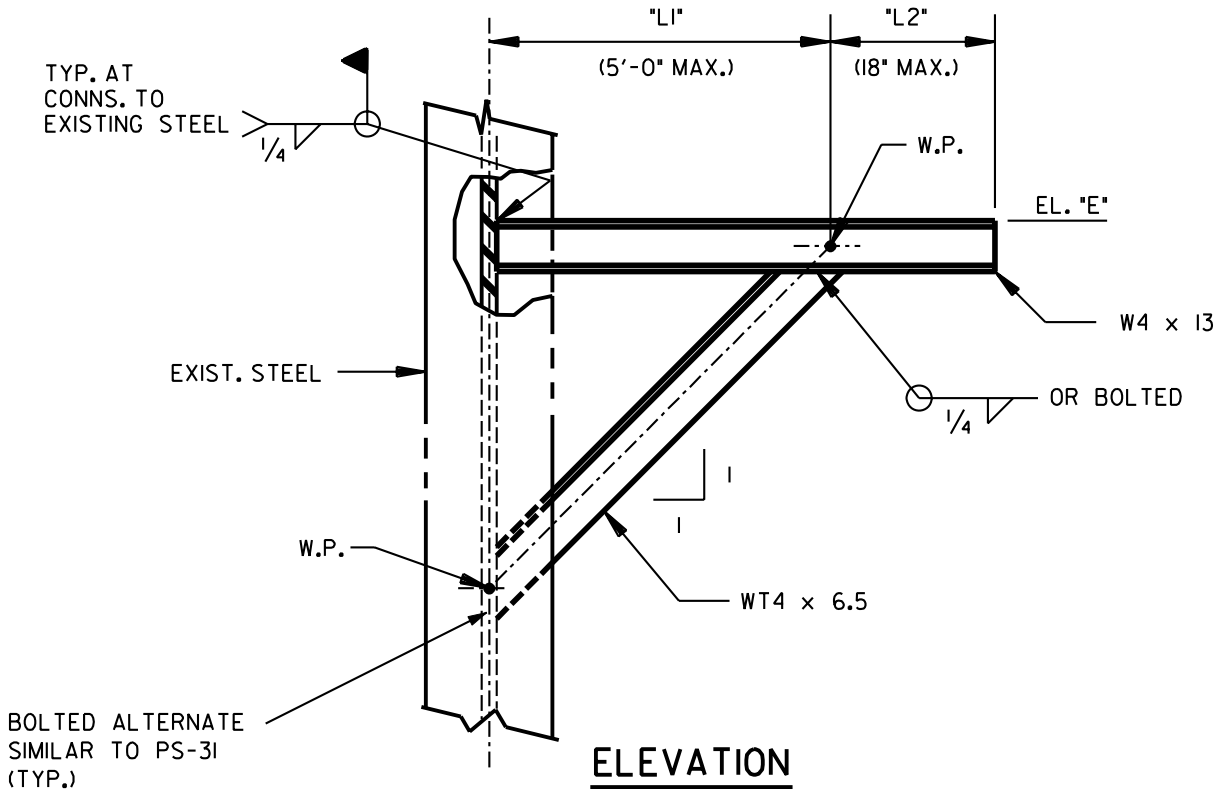
BOLTED ALTERNATE



ELEVATION

PS-31

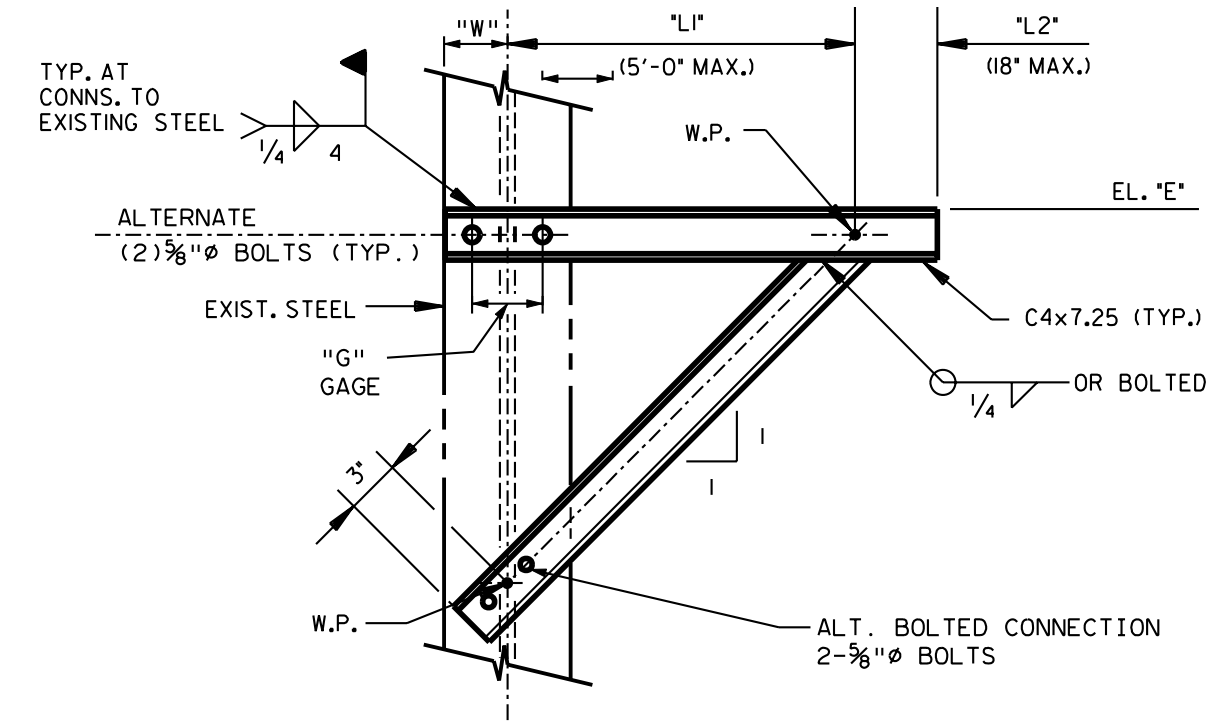
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-32

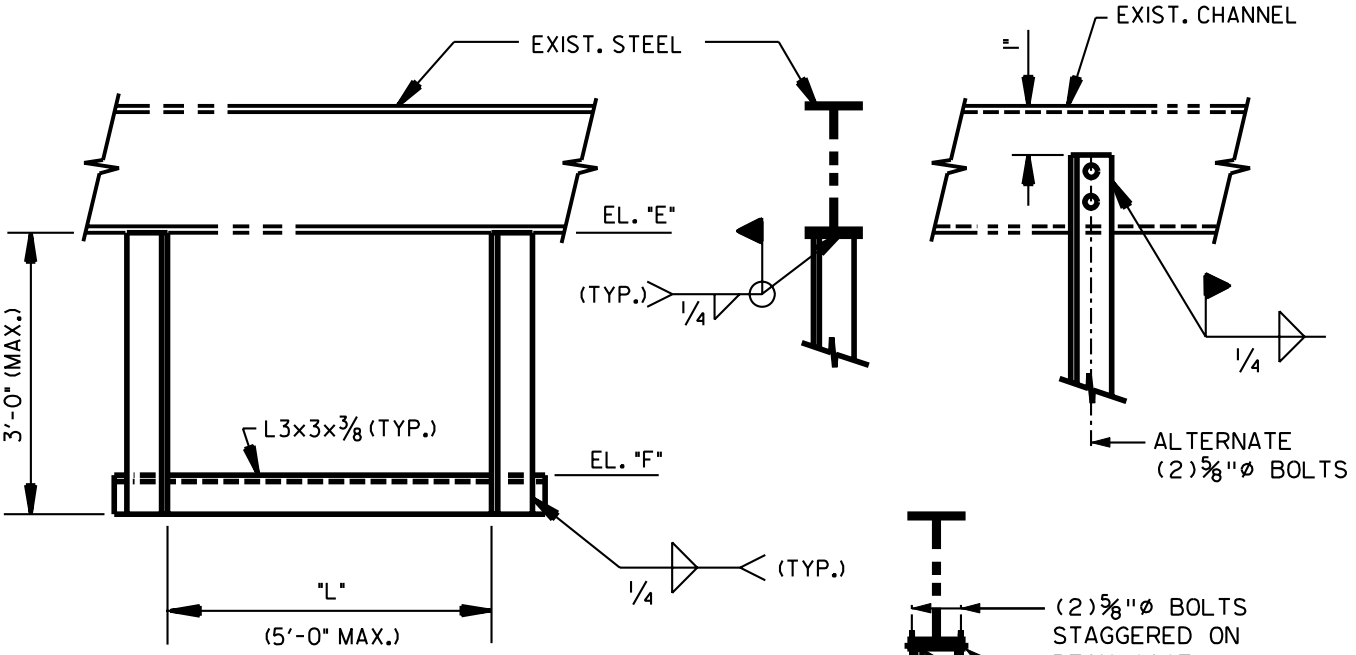
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-33

(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)

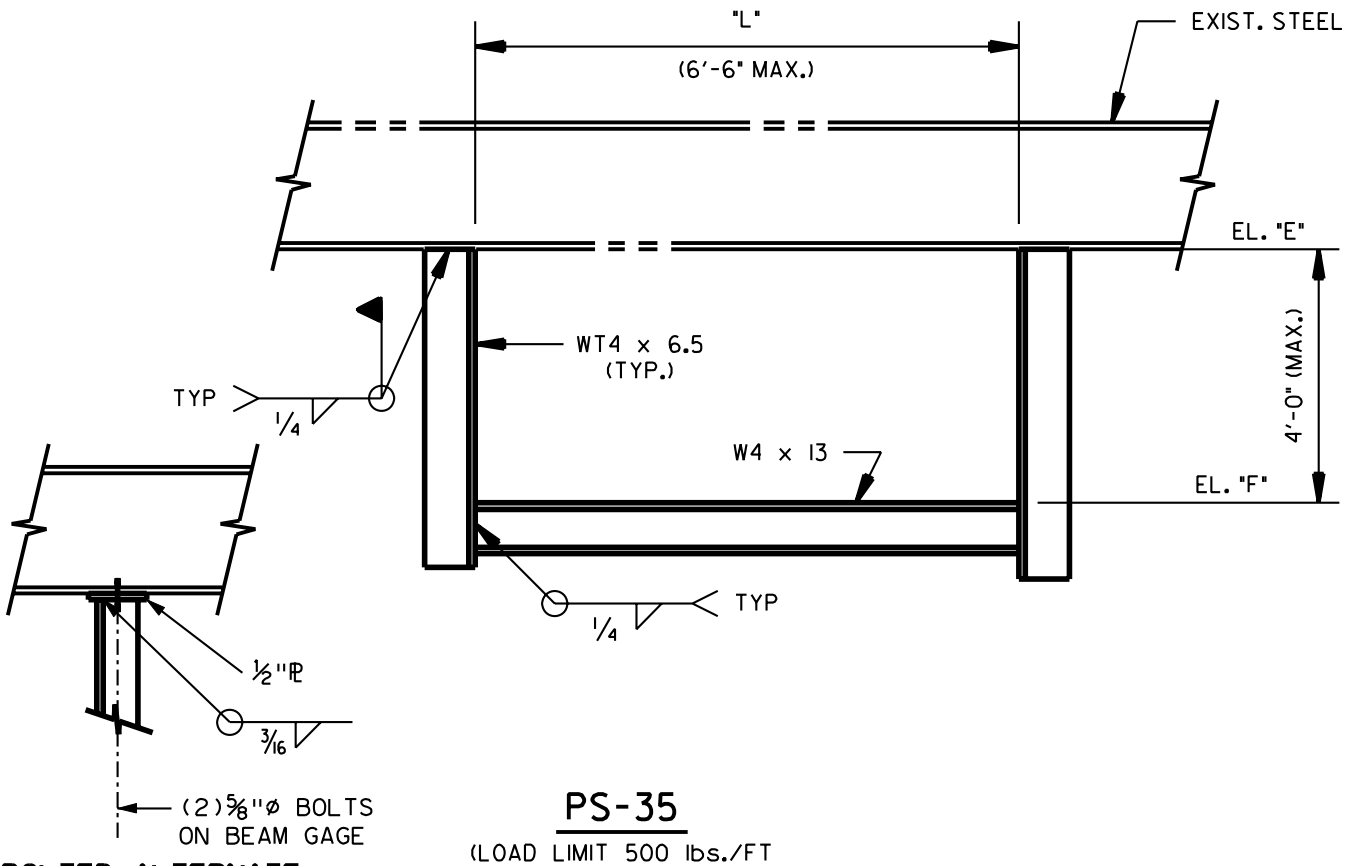


ELEVATION

PS-34

(LOAD LIMIT 250 lbs./FT
SEE SECTION 10.2)

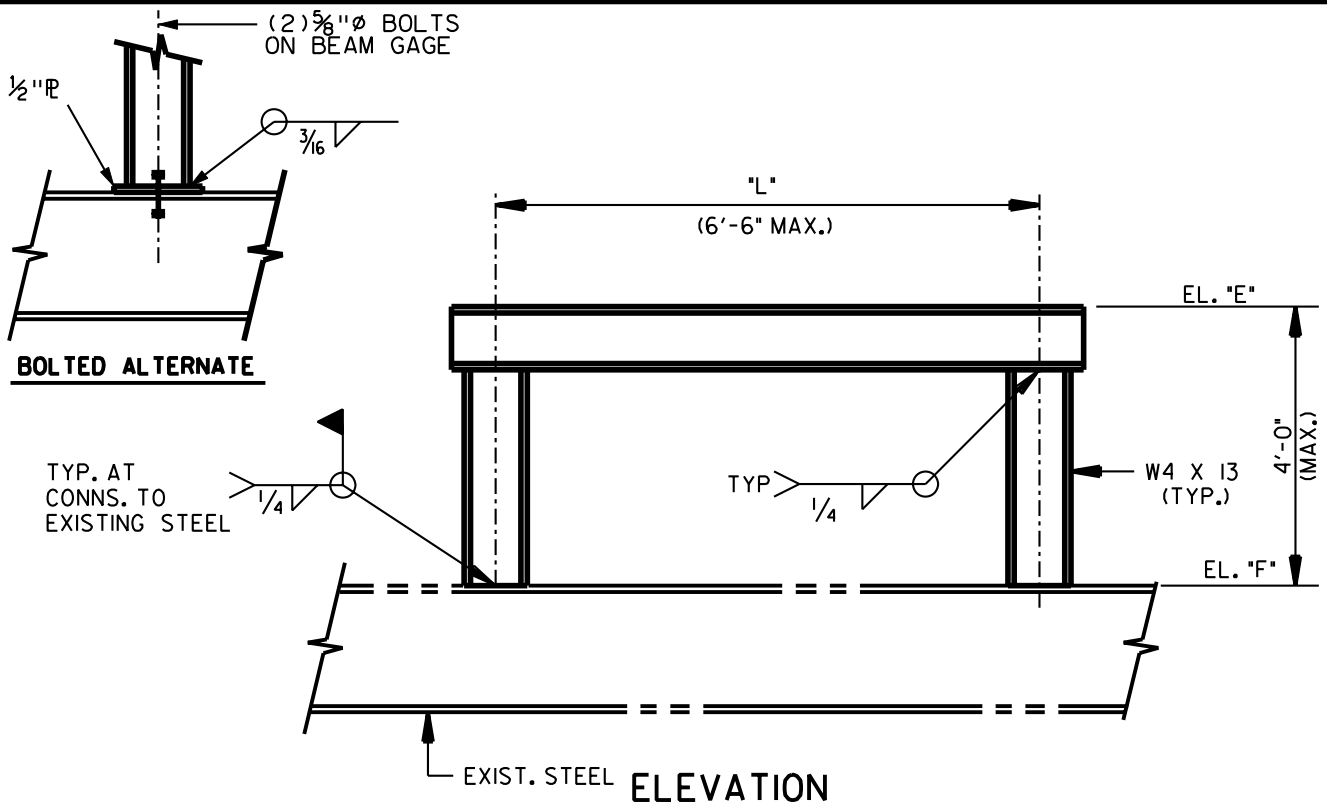
ALTERNATE CONNS.
TO EXISTING STEEL



BOLTED ALTERNATE

PS-35

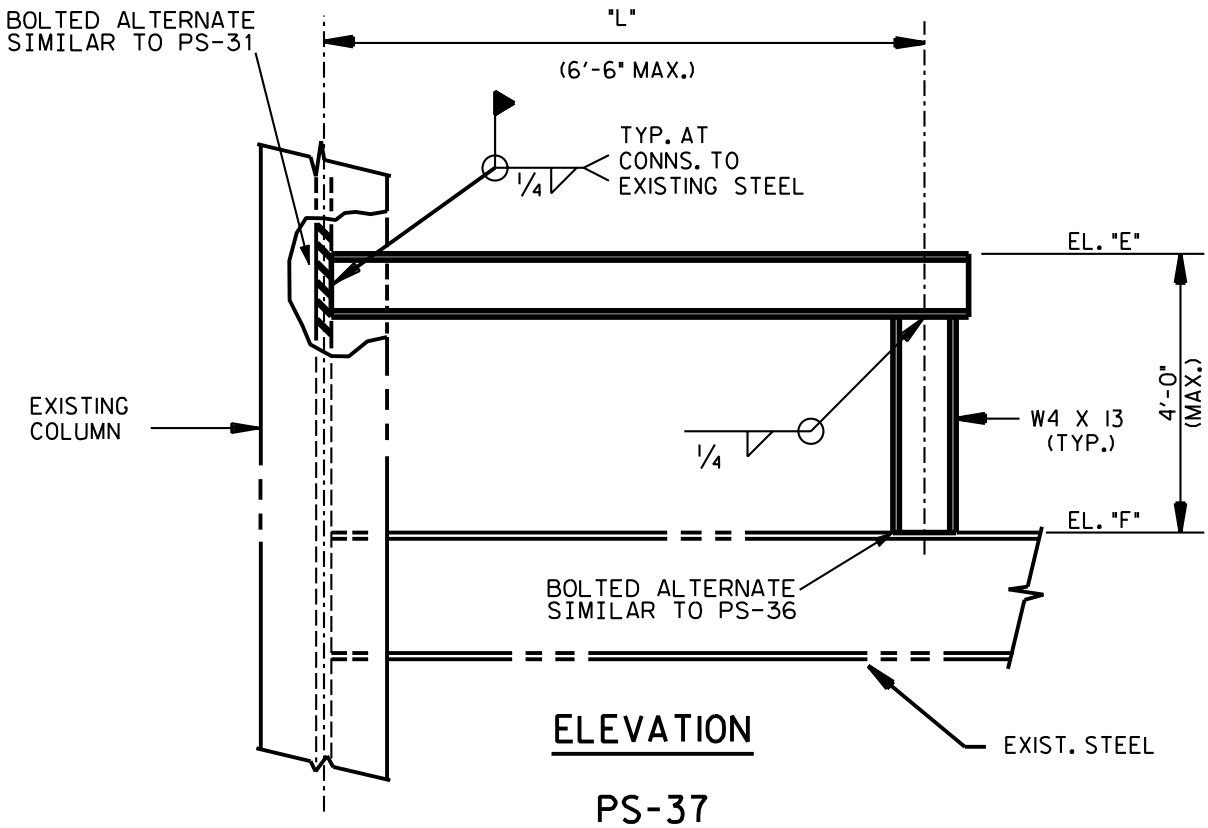
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-36

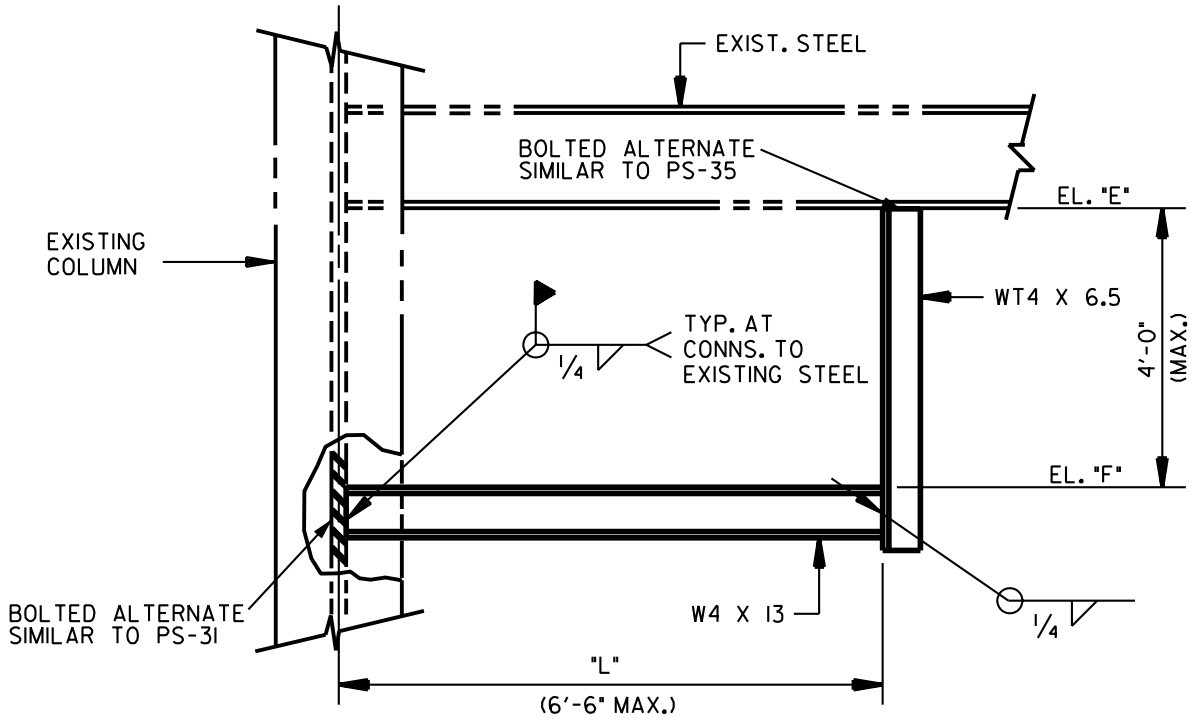
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-37

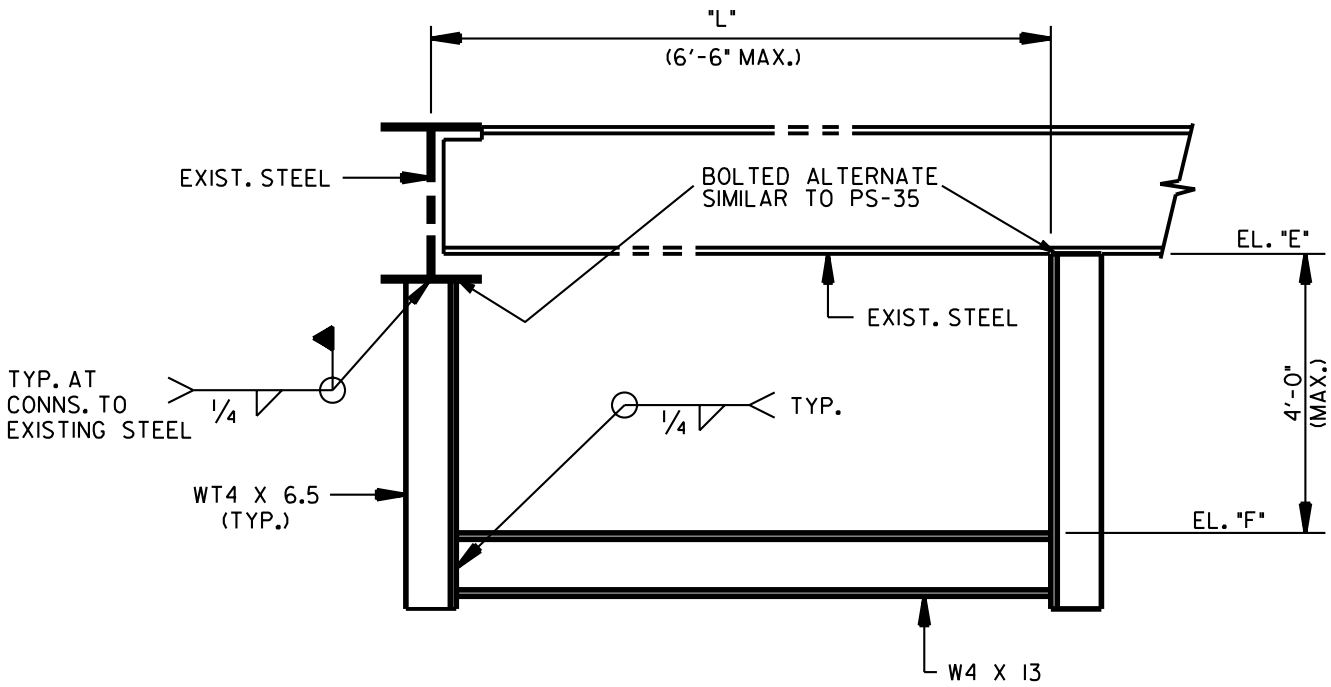
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-38

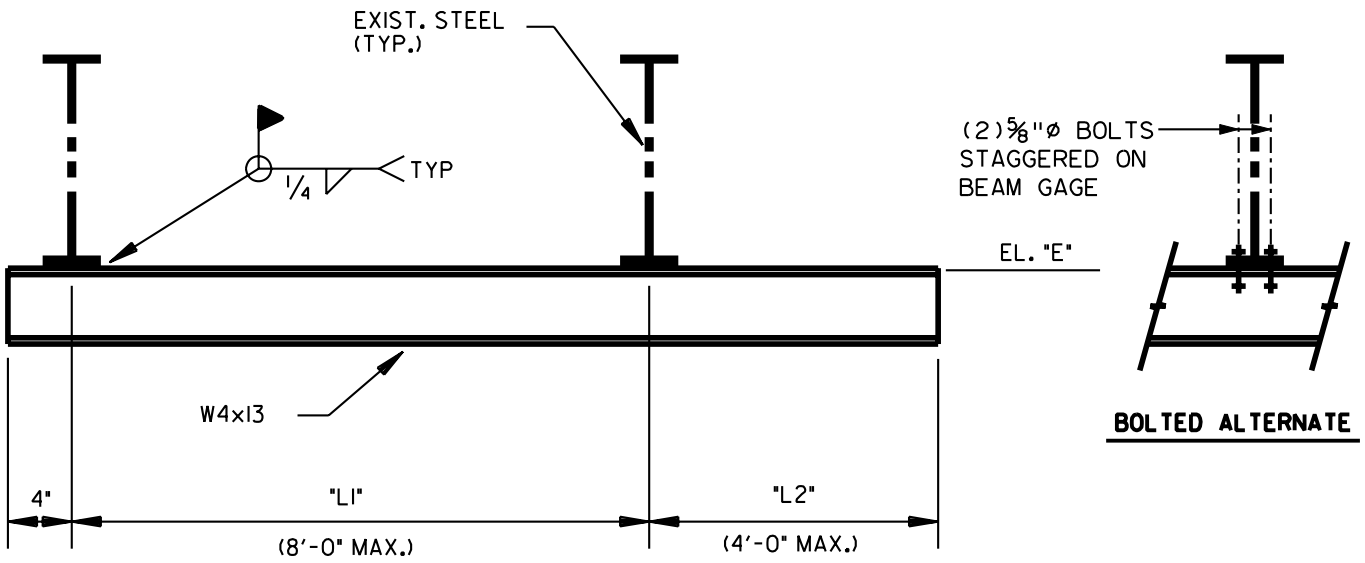
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-39

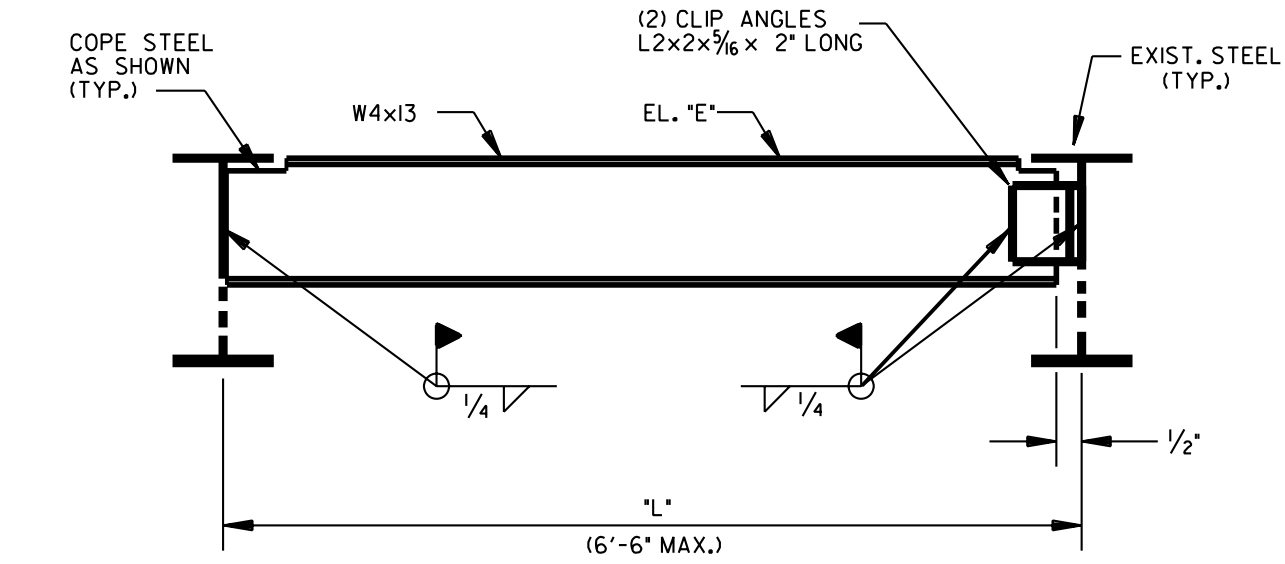
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)

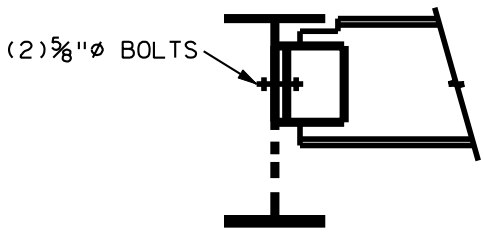


ELEVATION

PS-40

(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



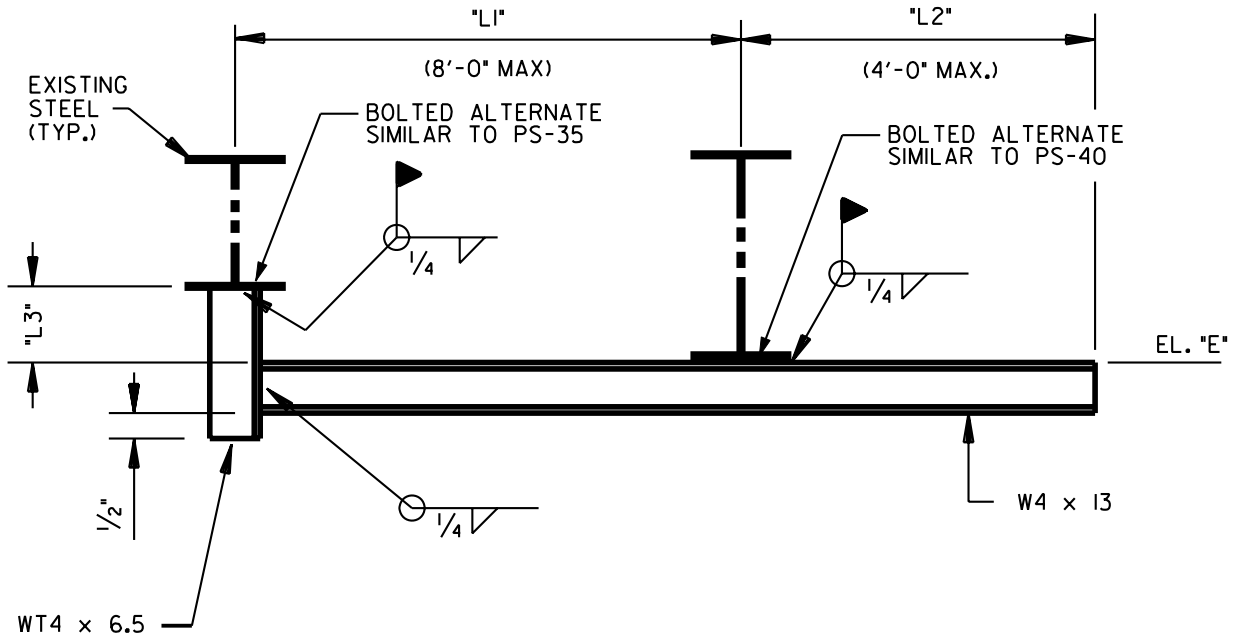


BOLTED ALTERNATE

ELEVATION

PS-41

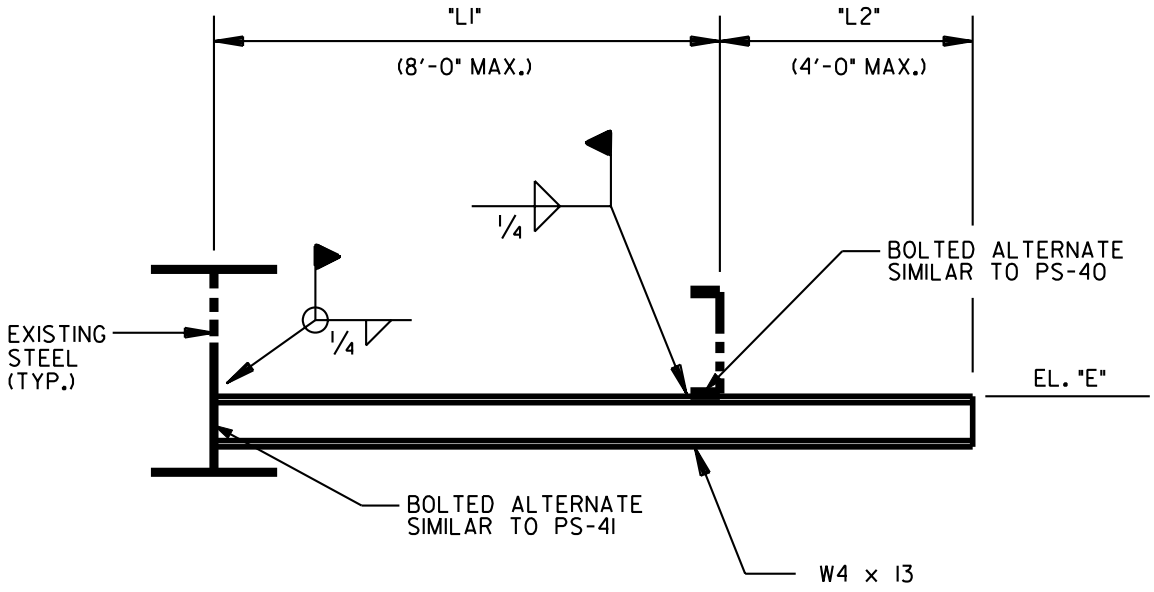
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-42

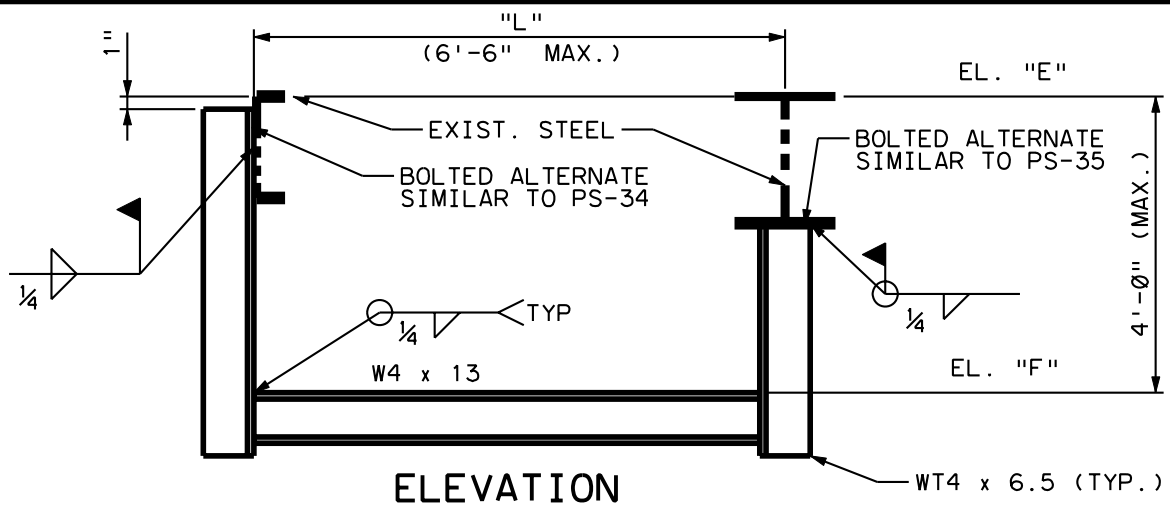
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-43

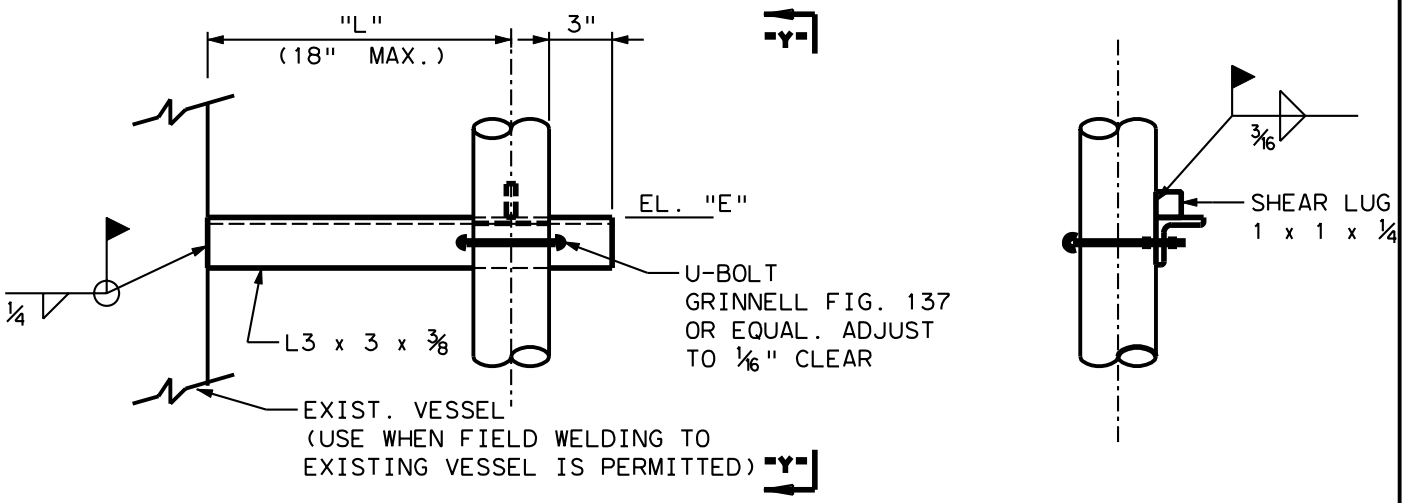
(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)



ELEVATION

PS-44

(LOAD LIMIT 500 lbs./FT
SEE SECTION 10.2)

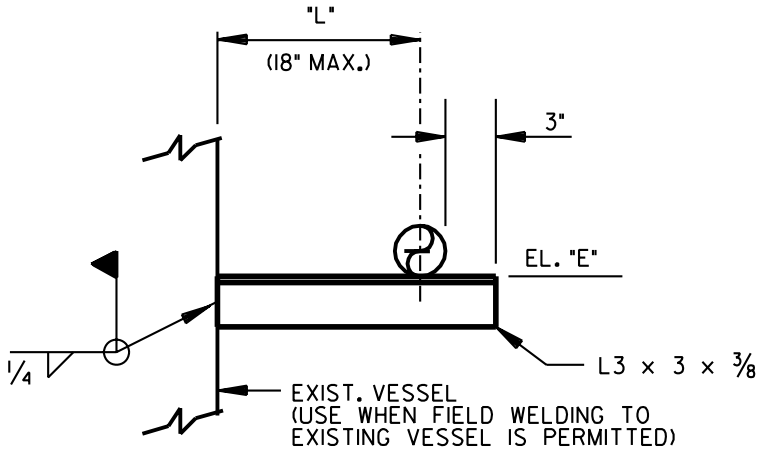


ELEVATION

PS-45

SECTION "Y-Y"

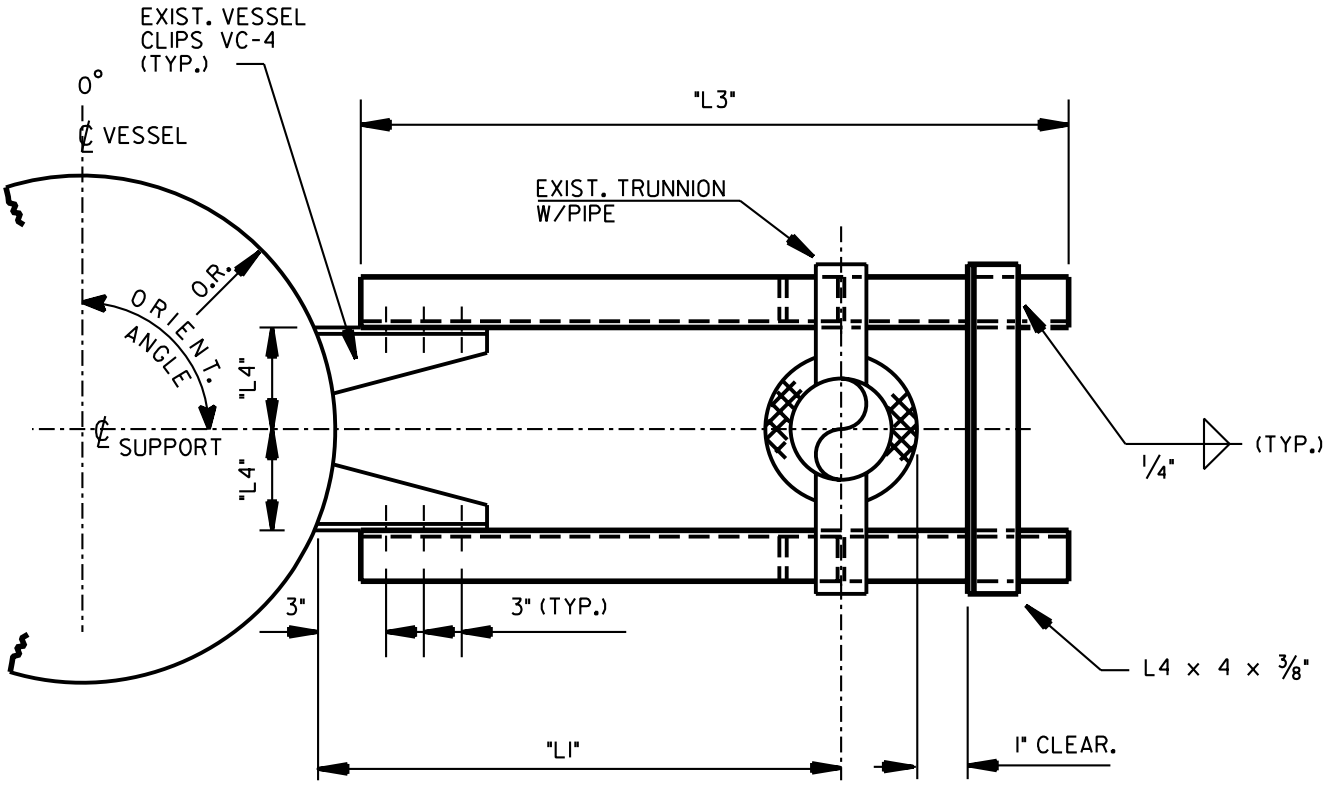
USE UP TO 3" MAX. PIPE SIZE
(SEE SECTION 10.3)



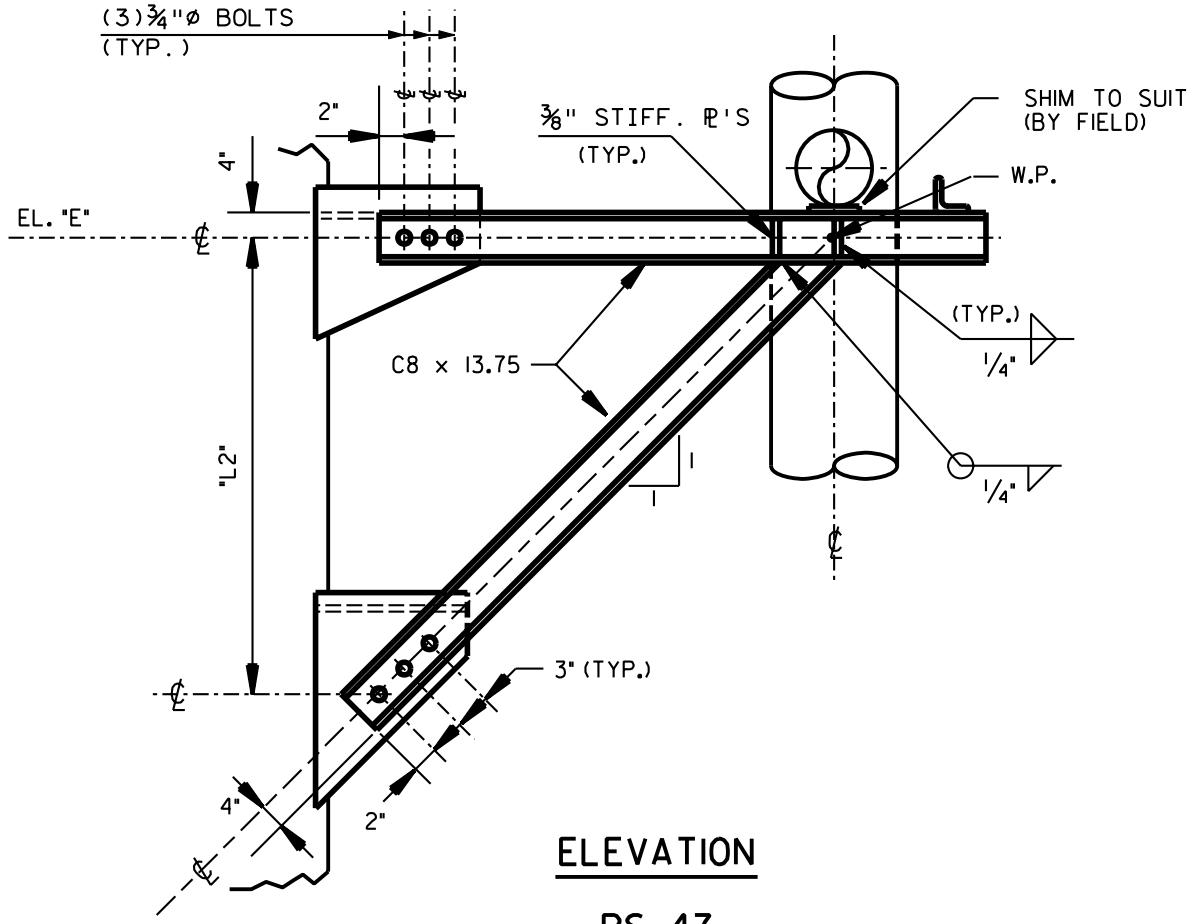
ELEVATION

PS-46

USE UP TO 3" MAX. PIPE SIZE
(SEE SECTION 10.3)



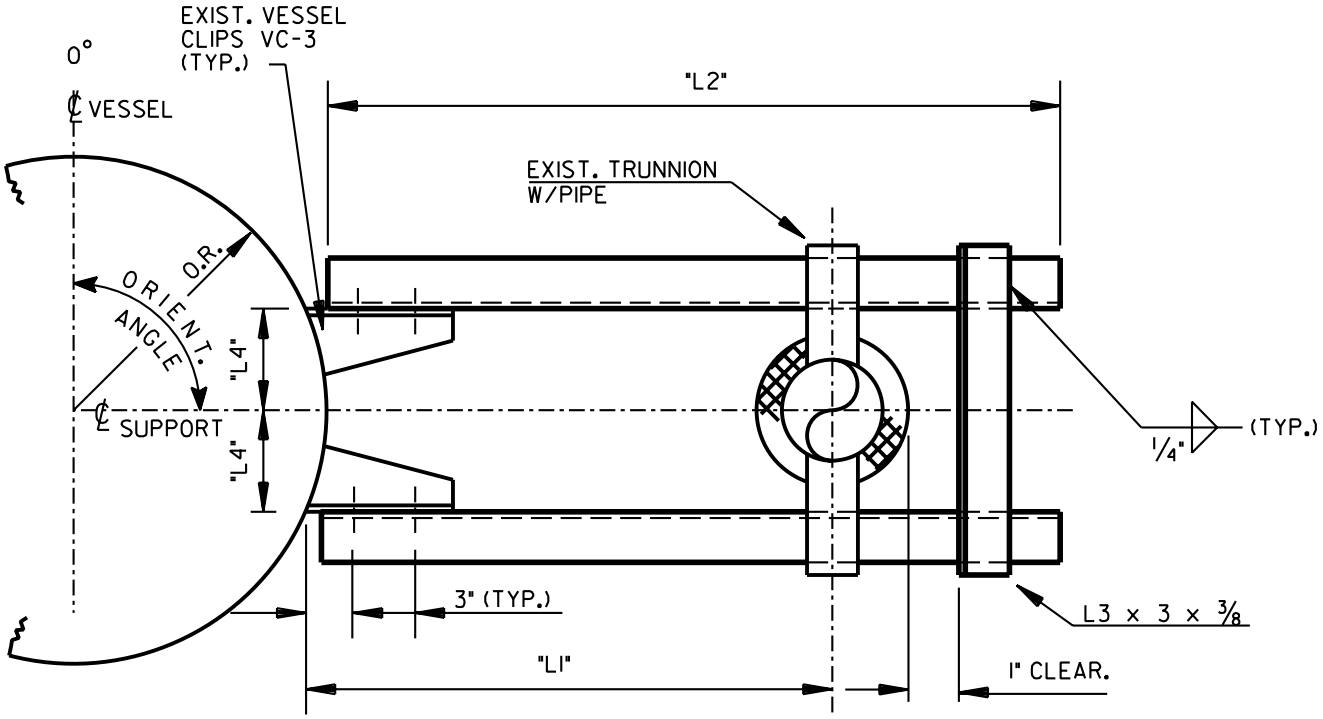
PLAN



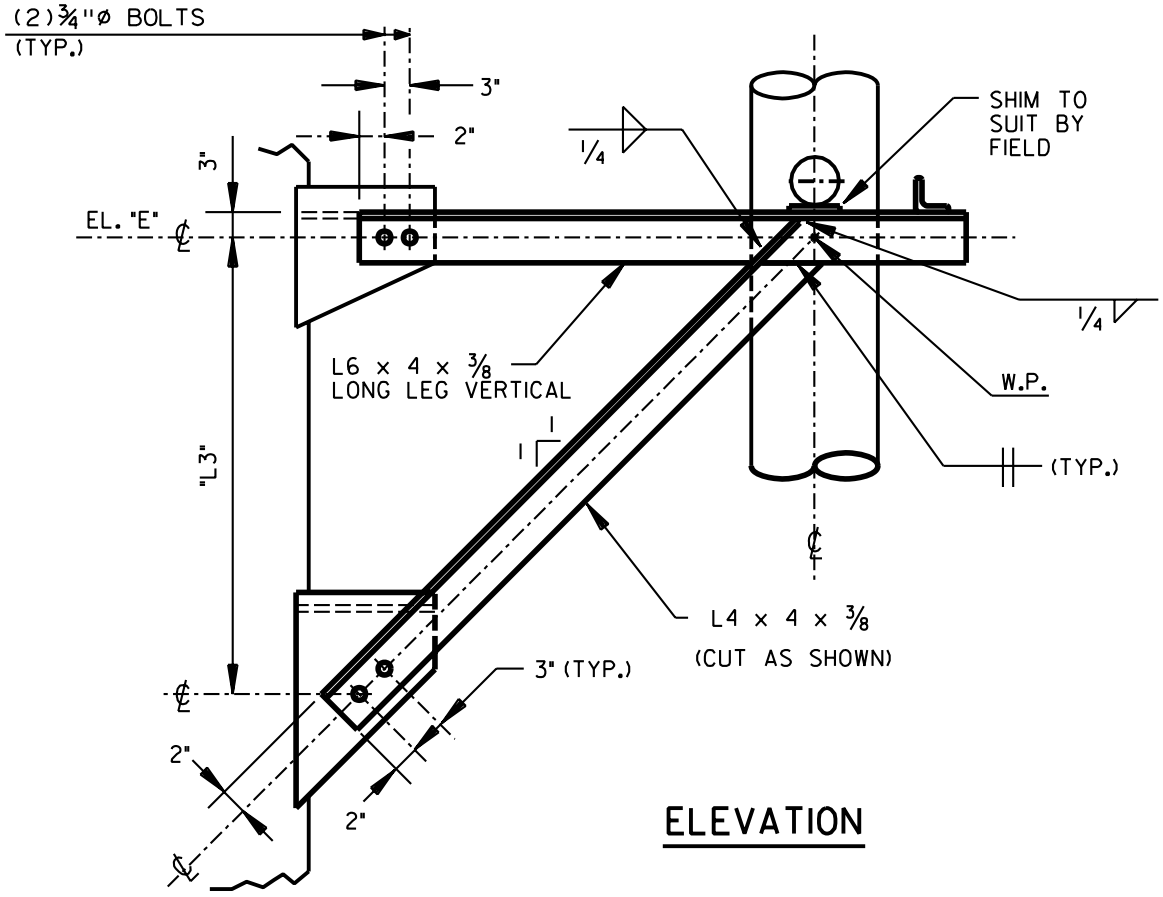
ELEVATION

PS-47

(SEE SECTION 10.3)



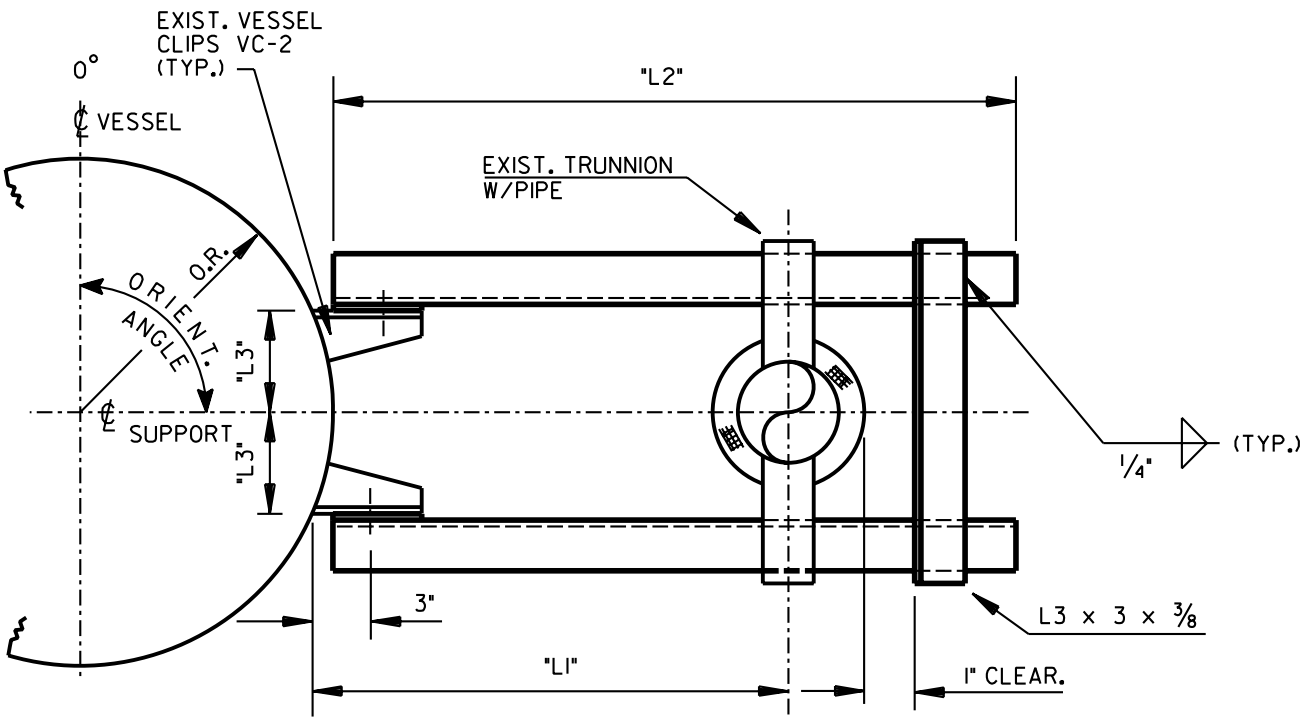
PLAN



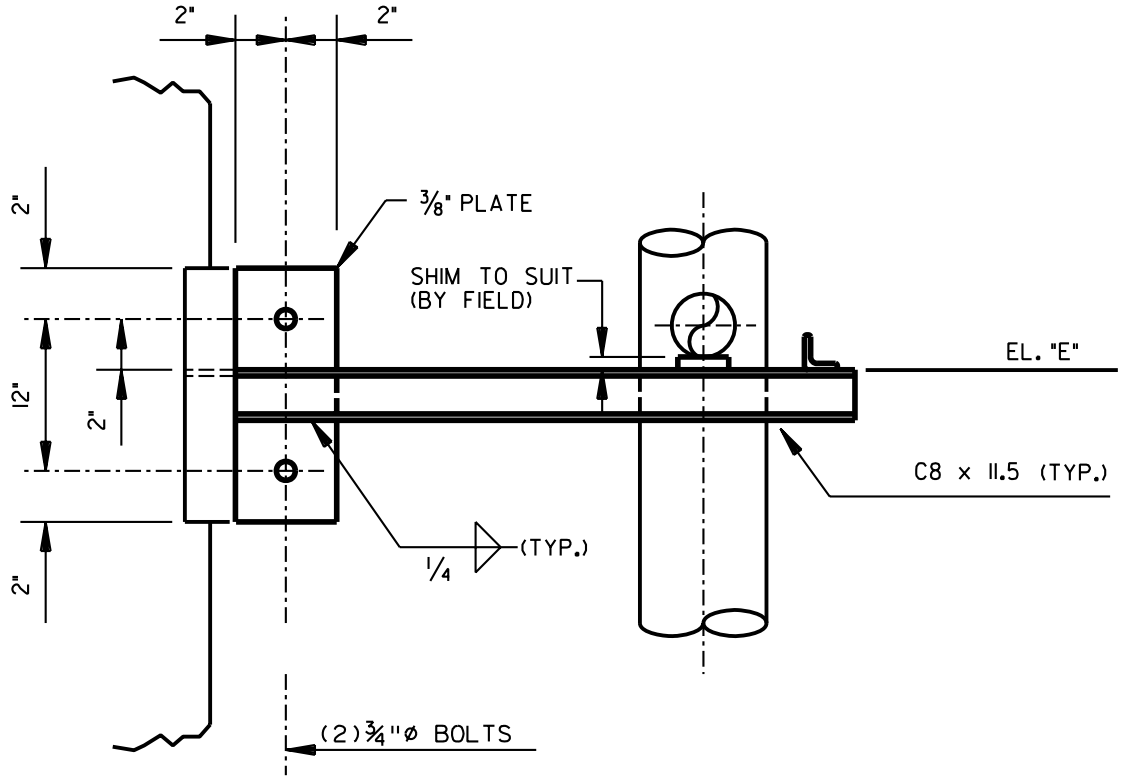
ELEVATION

PS-48

(SEE SECTION 10.3)



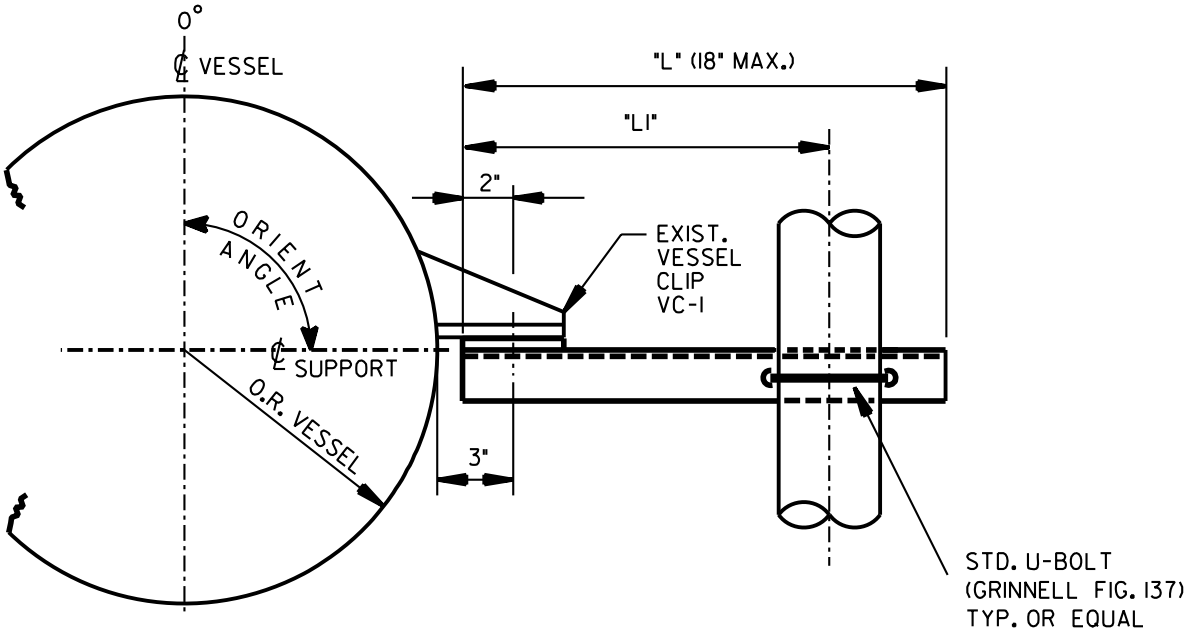
PLAN



ELEVATION

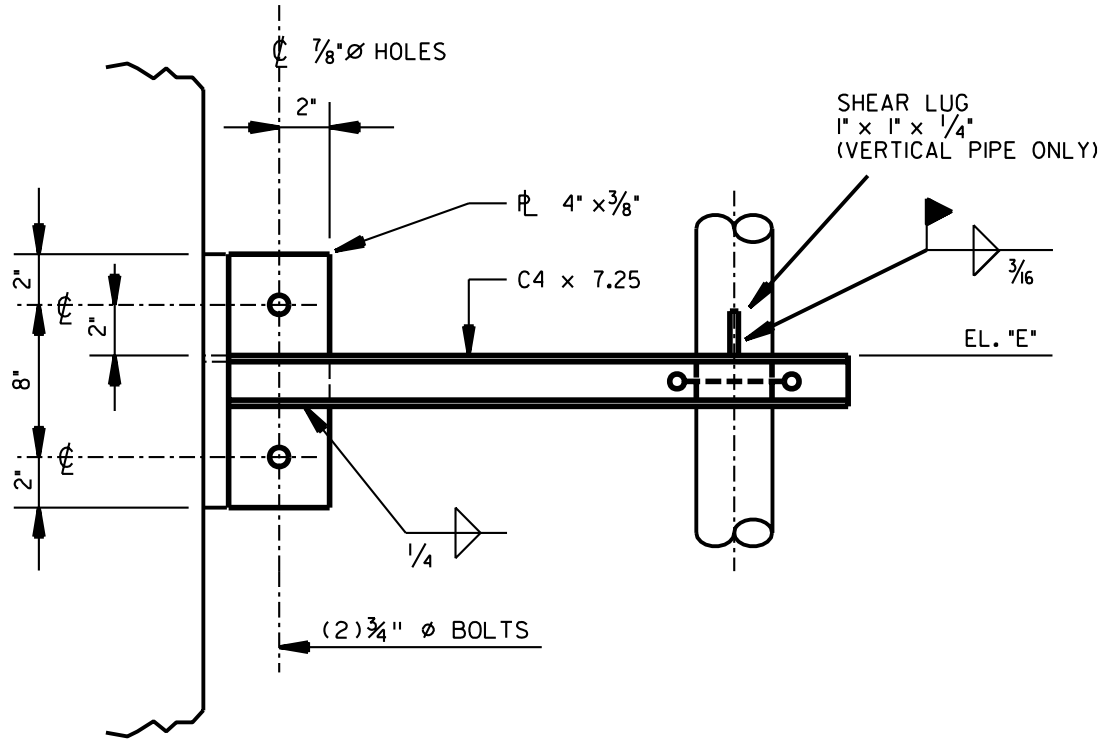
PS-49

(SEE SECTION 10.3)



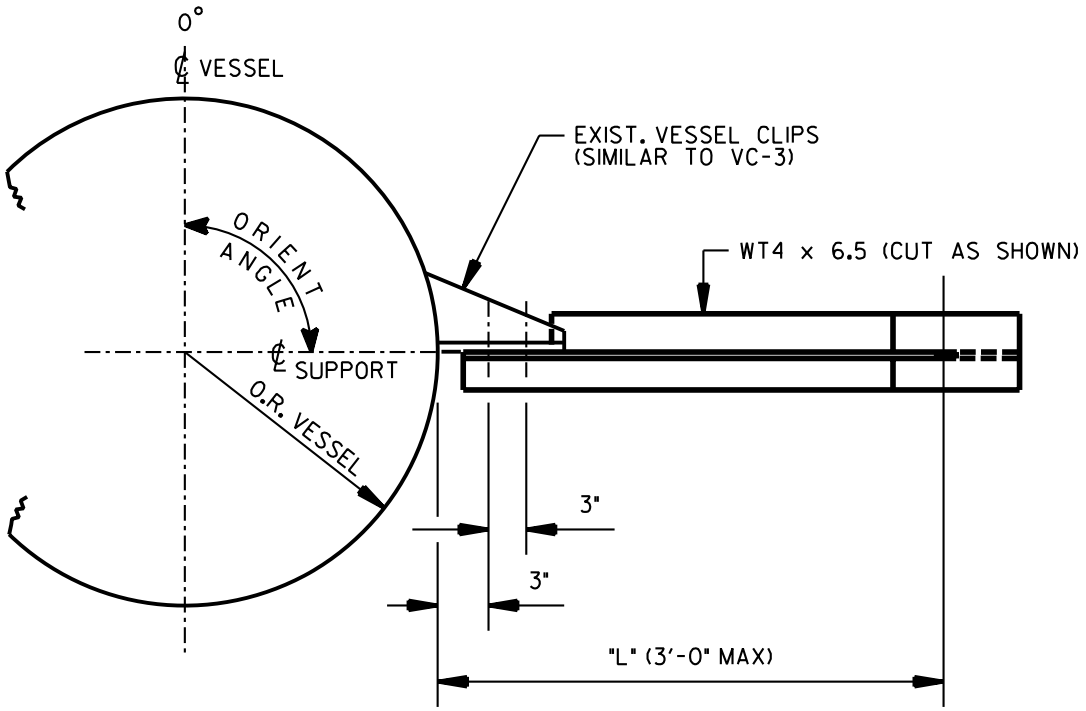
PLAN

NOTE:-
PIPE MAY BE SUPPORTED HORIZONTALLY OR VERTICALLY AS SHOWN.

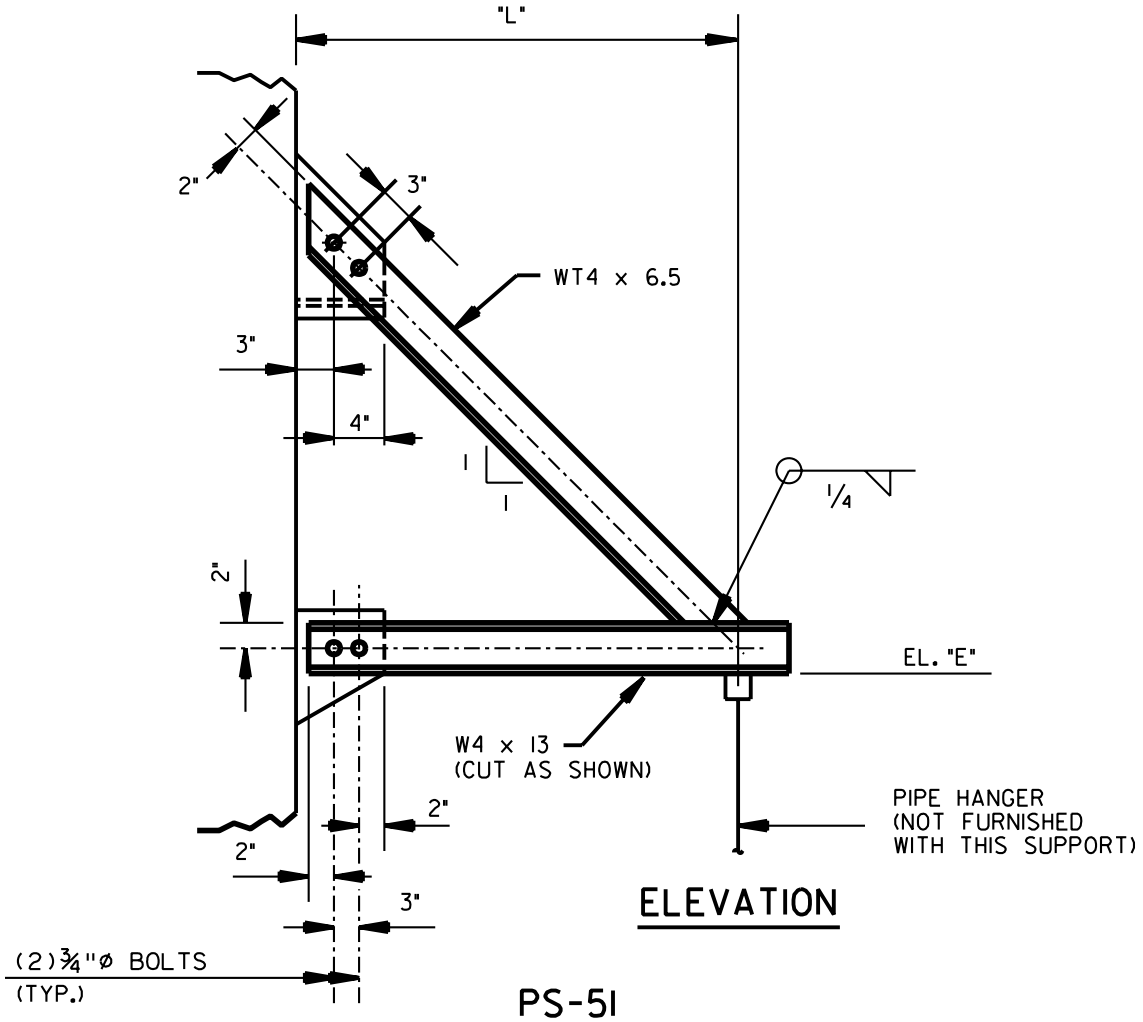


ELEVATION

PS-50
(SEE SECTION 10.3)



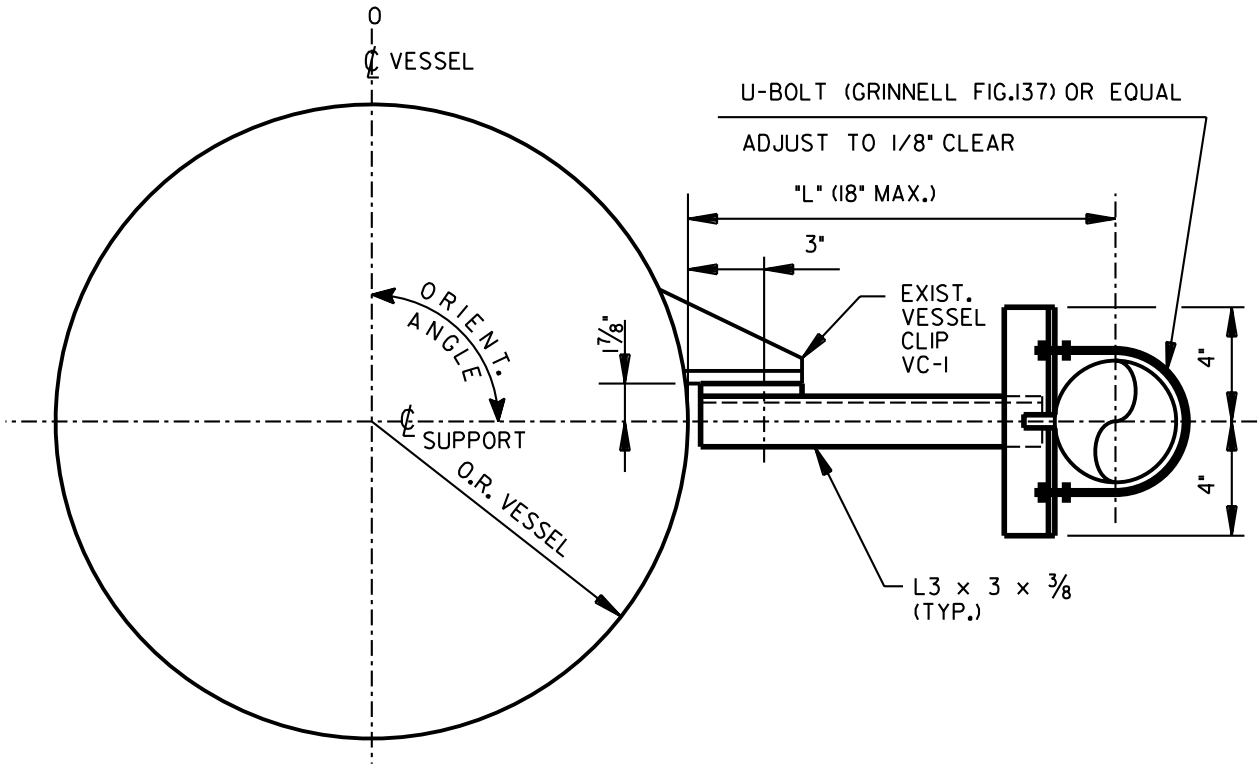
PLAN



ELEVATION

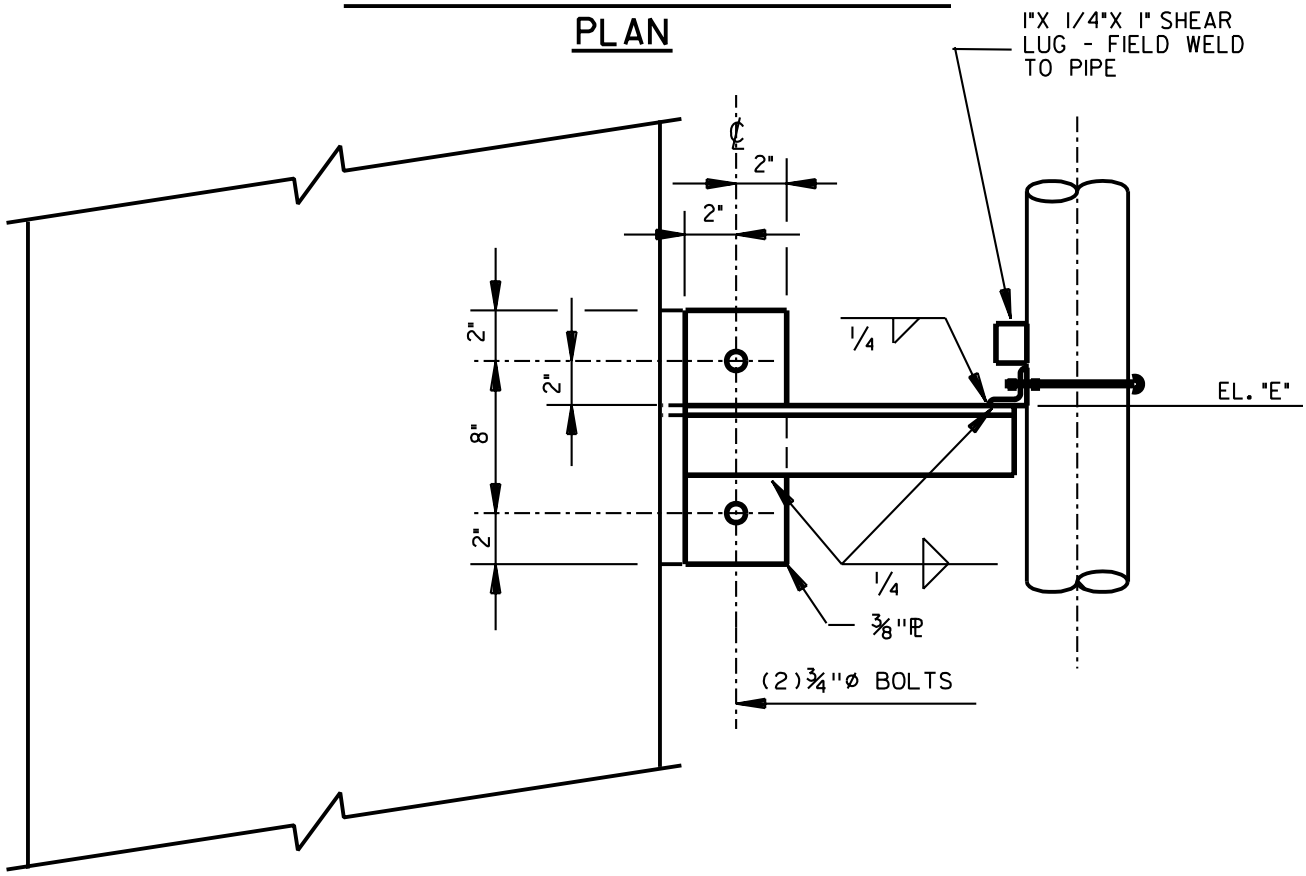
PS-5I

(SEE SECTION 10.3)



USE UP TO 3" MAX. PIPE SIZE

PLAN

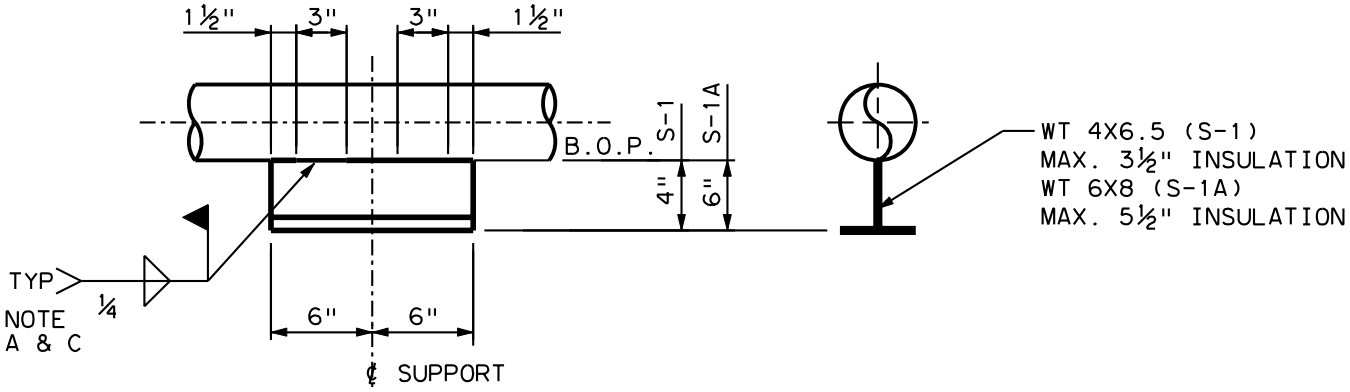


ELEVATION

PS-52

(SEE SECTION 10.3)

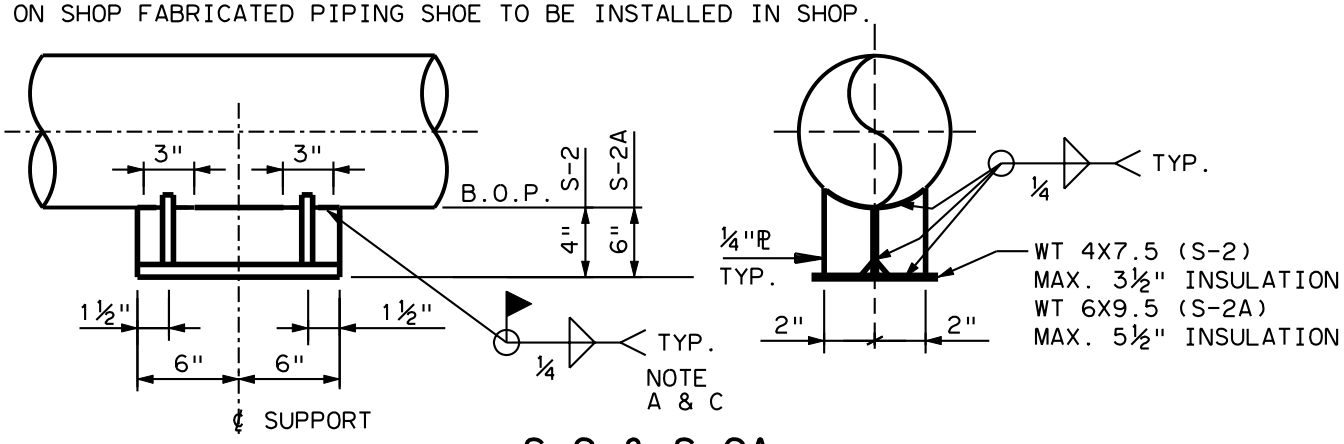
NOTES:
A. USE CONTINUOUS FILLET WELD WHEN SHOES ARE USED FOR GUIDES OR DIRECTIONAL STOPS.
B. "INTERLOCK" CLAMP ON SHOE (S-1Ø) MAY BE USED AS AN ALTERNATIVE TO THIS DETAIL WHEN GUIDE OR STOP IS NOT BEING USED.
C. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.



S-1 & S-1A

PIPE SHOE FOR 4" AND SMALLER C.S. PIPE

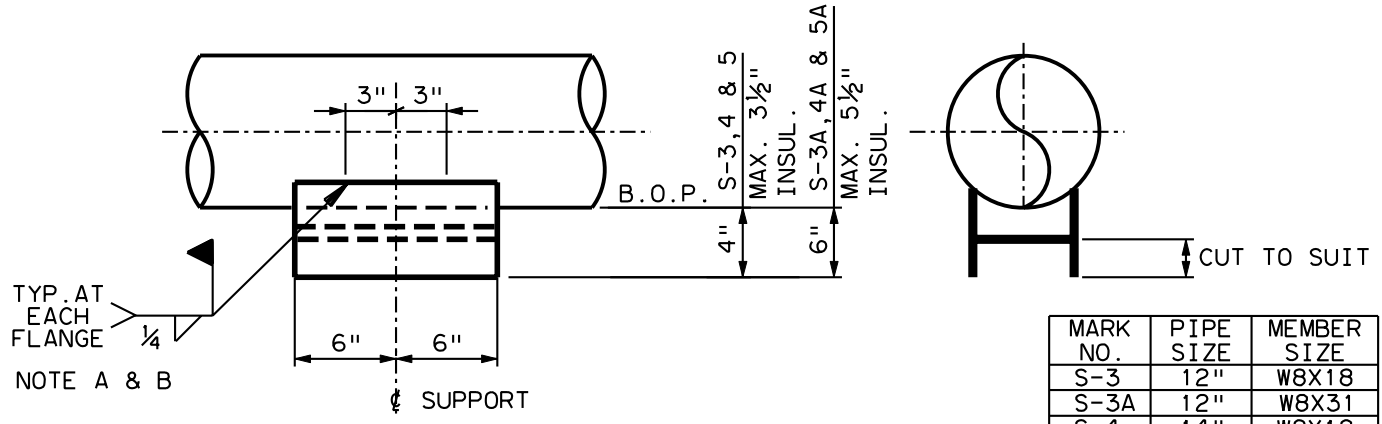
NOTES:
A. USE CONTINUOUS FILLET WELD WHEN SHOES ARE USED FOR GUIDES OR DIRECTIONAL STOPS.
B. "INTERLOCK" CLAMP ON SHOE (S-1Ø) MAY BE USED AS AN ALTERNATIVE TO THIS DETAIL WHEN GUIDE OR STOP IS NOT BEING USED UP TO 8" ONLY.
C. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.



S-2 & S-2A

PIPE SHOE FOR 6" THRU 10" C.S. PIPE

NOTES:
A. USE CONTINUOUS FILLET WELD WHEN SHOES ARE USED FOR GUIDES OR DIRECTIONAL STOPS.
B. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.

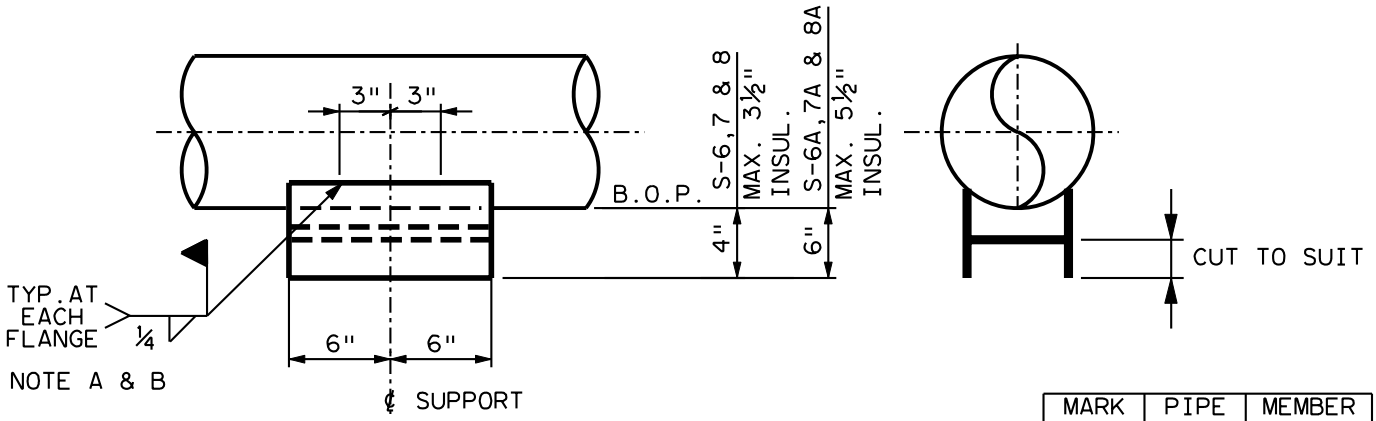


MARK NO.	PIPE SIZE	MEMBER SIZE
S-3	12"	W8X18
S-3A	12"	W8X31
S-4	14"	W8X18
S-4A	14"	W8X31
S-5	16"	W1ØX22
S-5A	16"	W1ØX33

S-3/3A, S-4/4A & S-5/5A

PIPE SHOE FOR 12" THRU 16" C.S. PIPE

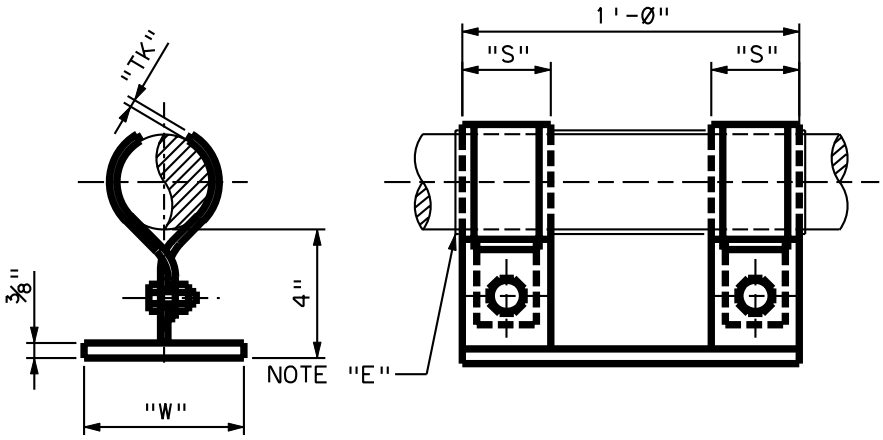
NOTES:
A. USE CONTINUOUS FILLET WELD WHEN SHOES ARE USED FOR GUIDES OR DIRECTIONAL STOPS.
B. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.



MARK NO.	PIPE SIZE	MEMBER SIZE
S-6	18"	W12X26
S-6A	18"	W12X53
S-7	20"	W14X30
S-7A	20"	W14X61
S-8	24"	W16X36
S-8A	24"	W16X67

S-6/6A, S-7/7A & S-8/8A

PIPE SHOE FOR 18" THRU 24" C.S. PIPE



ELEVATION

PIPE SIZE	"W"	"S"	"TK"	STATIC LOAD lb. (VERTICAL)
1"	3"	3"	3/16"	50
1½"	3"	3"	3/16"	88
2"	3"	3"	3/16"	126
3"	3"	3"	¼"	263
4"	3"	3"	¼"	400
6"	4"	4"	¼"	800
8"	4"	4"	5/16"	1000

ORDERING INFORMATION

PIPE SIZE ø	SHOE HEIGHT	SHOE LENGTH	ISOLATION/HEAT TRACE THERMAL BOOT
1" THRU 8"	4"	12"	N/A

TRI SYSTEMS
6461 SEIGEN LANE
BATON ROUGE, LA 70808

NOTES

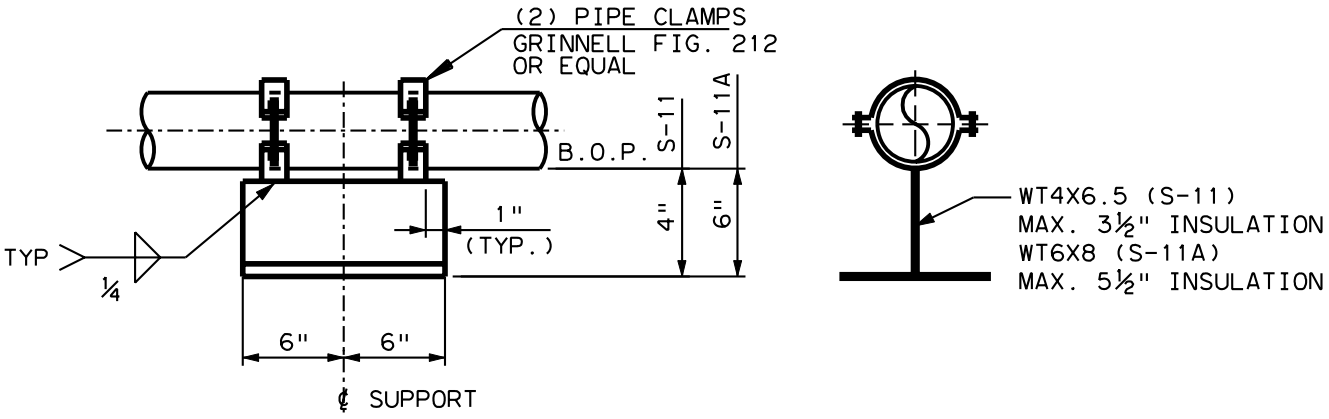
A. ALL PLATE IS TO BE A-36 C.S.
B. BOLTS ARE TO BE ½" A-449 WITH 2 HEX HEAD NUTS.
C. CLAMP ON PIPE SHOE IS TO BE INTERLOCK OR EQUAL.
D. DO NOT USE WITH GUIDE OR DIRECTIONAL STOP.
E. FOR SS PIPE USE 16 GA. SS INSULATION SHIELD. 1'-2" LONG x CIRCUMFERENCE OF PIPE PLUS 1". SECURE SHIELD WITH ½" x .02 SS BANDS (BY FIELD) MACHINE TIGHTEN (TYP. 2).

S-10

PIPE SHOE FOR 8" AND SMALLER
C.S. & S.S. PIPE

NOTES:

A. "INTERLOCK" CLAMP ON SHOE (S-1Ø) MAY BE USED AS AN ALTERNATIVE TO THIS WHEN GUIDE OR STOP IS NOT BEING USED.
B. DO NOT USE THIS SHOE FOR GUIDES OR DIRECTIONAL STOP. (USE DETAIL "S-2Ø")

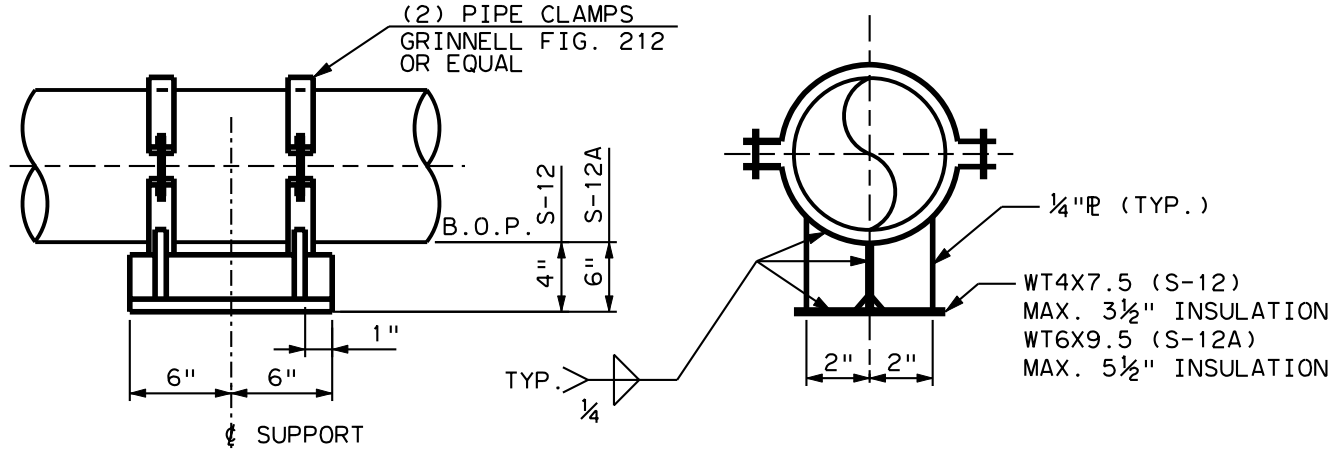


S-11 & S-11A

PIPE SHOE FOR 4" AND SMALLER ALLOY PIPE

NOTES:

A. "INTERLOCK" CLAMP ON SHOE (S-1Ø) MAY BE USED AS AN ALTERNATIVE TO THIS WHEN GUIDE OR STOP IS NOT BEING USED UP TO 8" PIPE.
B. DO NOT USE THIS SHOE FOR GUIDES OR DIRECTIONAL STOP. (USE DETAIL "S-21")

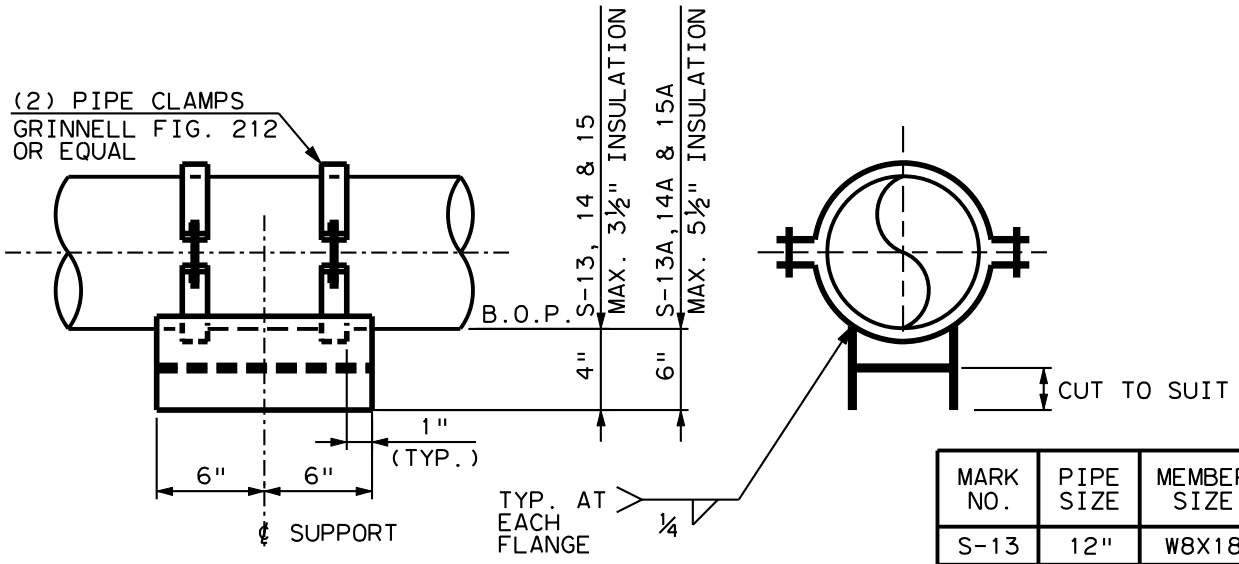


S-12 & S-12A

PIPE SHOE FOR 6" THRU 1Ø" ALLOY PIPE

NOTES:

A. DO NOT USE THIS SHOE FOR GUIDES OR DIRECTIONAL STOP. (USE DETAIL "S-22,23 & 24")



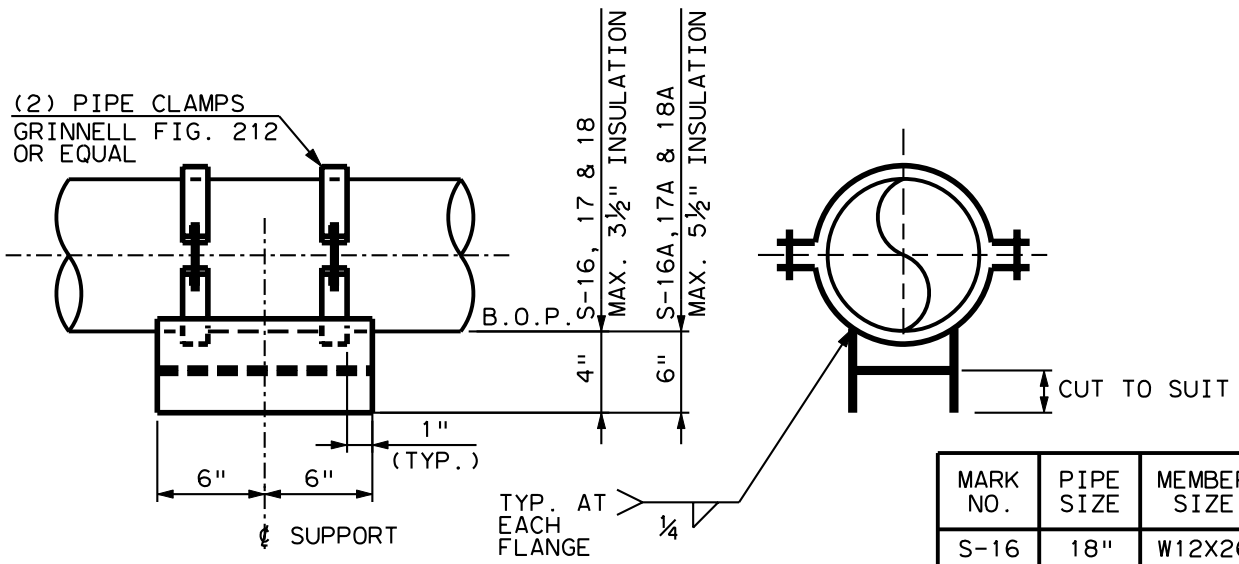
MARK NO.	PIPE SIZE	MEMBER SIZE
S-13	12"	W8X18
S-13A	12"	W8X31
S-14	14"	W8X18
S-14A	14"	W8X31
S-15	16"	W10X22
S-15A	16"	W10X33

S-13/13A, S-14/14A & S-15/15A

PIPE SHOE FOR 12" THRU 16" ALLOY PIPE

NOTES:

A. DO NOT USE THIS SHOE FOR GUIDES OR DIRECTIONAL STOP. (USE DETAIL "S-25,26 & 27")

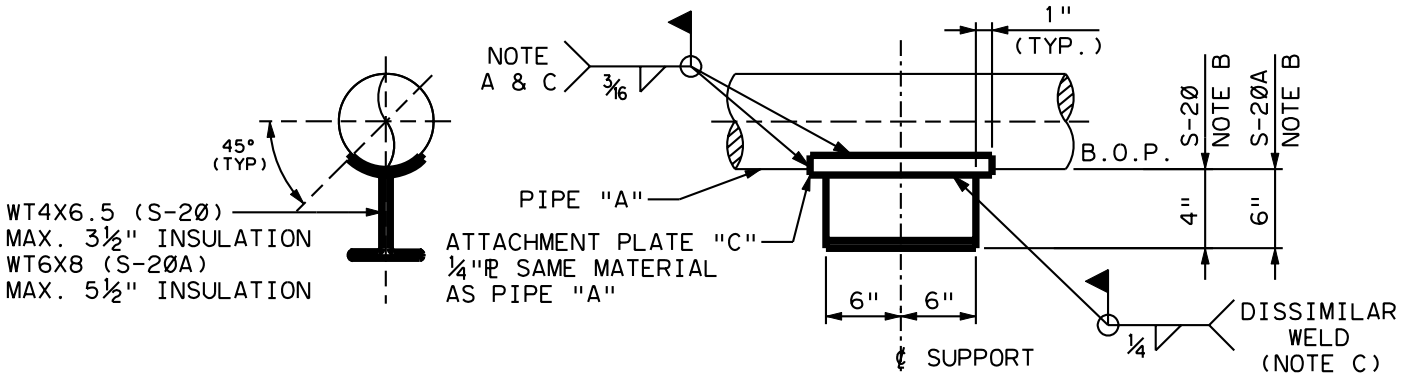


MARK NO.	PIPE SIZE	MEMBER SIZE
S-16	18"	W12X26
S-16A	18"	W12X53
S-17	20"	W14X30
S-17A	20"	W14X61
S-18	24"	W16X36
S-18A	24"	W16X67

S-16/16A, S-17/17A & S-18/18A

PIPE SHOE FOR 18" THRU 24" ALLOY PIPE

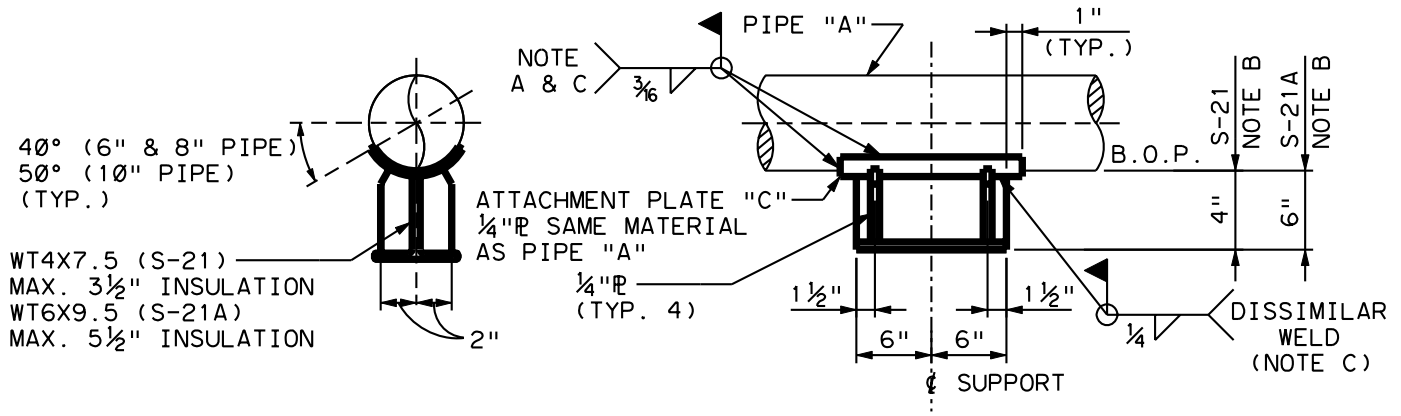
NOTES:
A. USE CONTINUOUS FILLET WELD FOR SHOE ATTACHMENT PLATE "C" EXCEPT SKIP ½" OF WELD @ B.O.P. FOR BLOW BACK VENT.
B. SHOE MATERIAL TO BE TRIMMED THE THICKNESS OF PLATE "C" TO MAINTAIN 4" OR 6" SHOE HEIGHT FROM B.O.P.
C. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.



S-20 & S-20A

PIPE SHOE FOR 4" AND SMALLER ALLOY PIPE
(FOR USE WITH GUIDES OR DIRECTIONAL STOPS ONLY)

NOTES:
A. USE CONTINUOUS FILLET WELD FOR SHOE ATTACHMENT PLATE "C" EXCEPT SKIP ½" OF WELD @ B.O.P. FOR BLOW BACK VENT.
B. SHOE MATERIAL TO BE TRIMMED THE THICKNESS OF PLATE "C" TO MAINTAIN 4" OR 6" SHOE HEIGHT FROM B.O.P.
C. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.

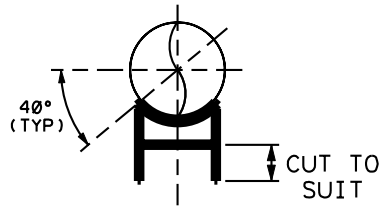


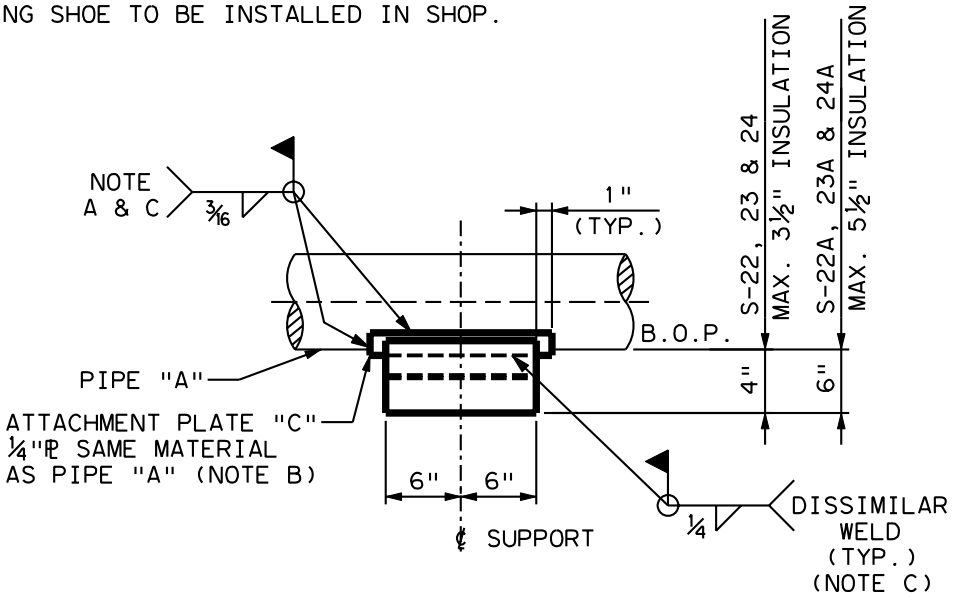
S-21 & S-21A

PIPE SHOE FOR 6" THRU 10" ALLOY PIPE
(FOR USE WITH GUIDES OR DIRECTIONAL STOPS ONLY)

NOTES:

A. USE CONTINUOUS FILLET WELD FOR SHOE ATTACHMENT PLATE "C" EXCEPT SKIP ½" OF WELD @ B.O.P. FOR BLOW BACK VENT.
B. SHOE MATERIAL TO BE TRIMMED THE THICKNESS OF PLATE "C" TO MAINTAIN 4" OR 6" SHOE HEIGHT FROM B.O.P.
C. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.





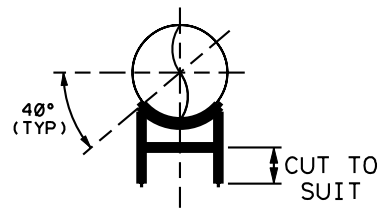
MARK NO.	PIPE SIZE	MEMBER SIZE
S-22	12"	W8X18
S-22A	12"	W8X31
S-23	14"	W8X18
S-23A	14"	W8X31
S-24	16"	W10X22
S-24A	16"	W10X33

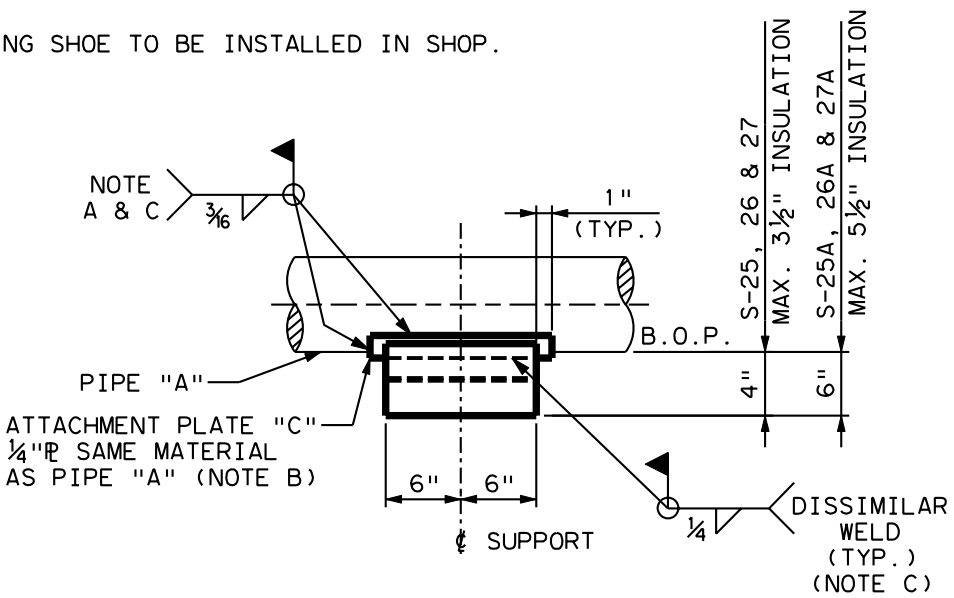
S-22/22A, S-23/23A & S-24/24A

PIPE SHOE FOR 12" THRU 16" ALLOY PIPE
(FOR USE WITH GUIDES OR DIRECTIONAL STOPS ONLY)

NOTES:

A. USE CONTINUOUS FILLET WELD FOR SHOE ATTACHMENT PLATE "C" EXCEPT SKIP ½" OF WELD @ B.O.P. FOR BLOW BACK VENT.
B. SHOE MATERIAL TO BE TRIMMED THE THICKNESS OF PLATE "C" TO MAINTAIN 4" OR 6" SHOE HEIGHT FROM B.O.P.
C. ON SHOP FABRICATED PIPING SHOE TO BE INSTALLED IN SHOP.

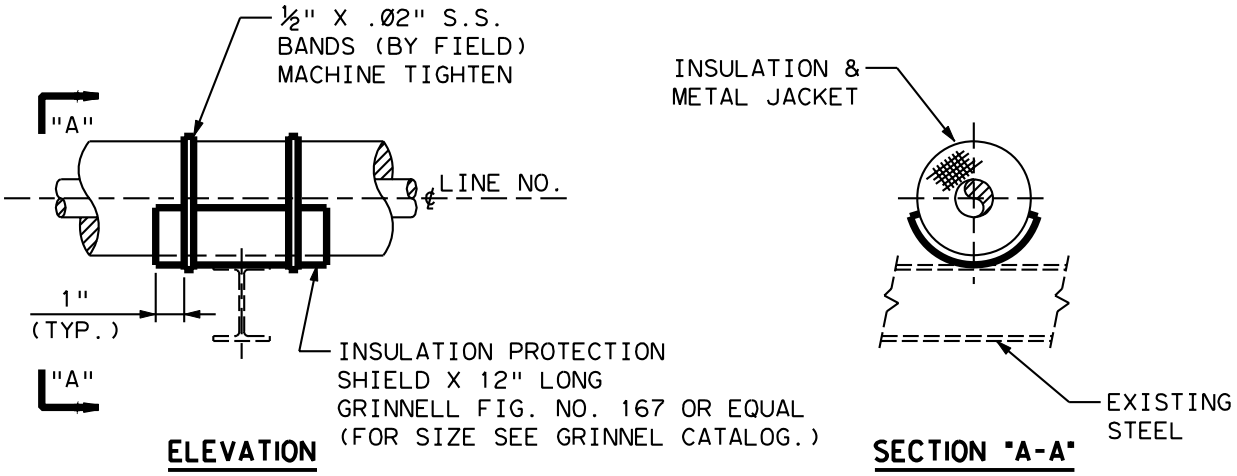




MARK NO.	PIPE SIZE	MEMBER SIZE
S-25	18"	W12X26
S-25A	18"	W12X53
S-26	20"	W14X30
S-26A	20"	W14X61
S-27	24"	W16X36
S-27A	24"	W16X67

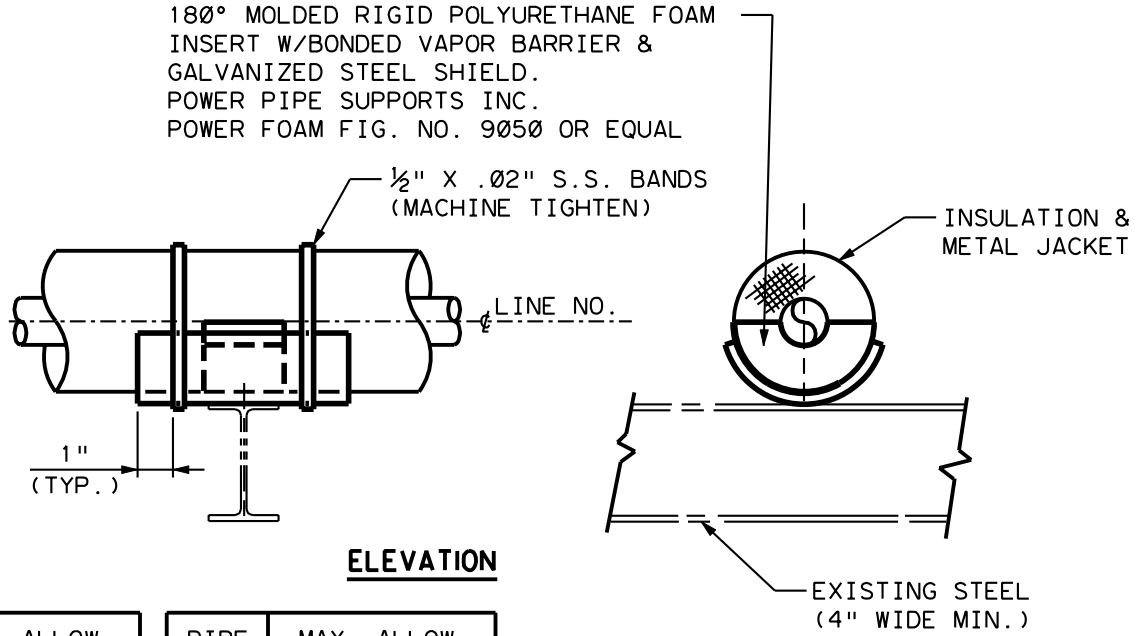
S-25/25A, S-26/26A & S-27/27A

PIPE SHOE FOR 18" THRU 24" ALLOY PIPE
(FOR USE WITH GUIDES OR DIRECTIONAL STOPS ONLY)



S-29

PIPE SHOE FOR 1½" AND SMALLER C.S. AND S.S. PIPE

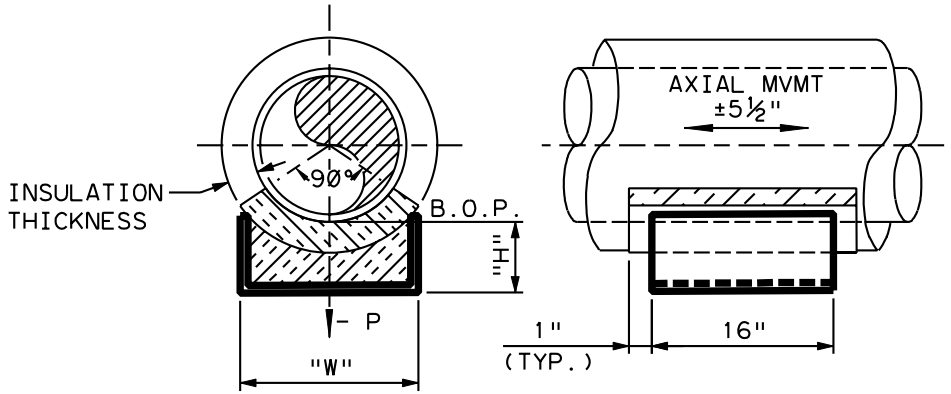


PIPE SIZE	MAX. ALLOW. SPAN
¾"	10 FT.
1"	12 FT.
1½"	15 FT.
2"	17 FT.
3"	21 FT.
4"	21 FT.

PIPE SIZE	MAX. ALLOW. SPAN
6"	17 FT.
8"	15 FT.
10"	13 FT.
12"	12 FT.
14"	11 FT.
16"	10 FT.

S-30

PIPE SHOE FOR COLD INSULATED PIPING



ELEVATION

INSULATION / LOADS SCHEDULE

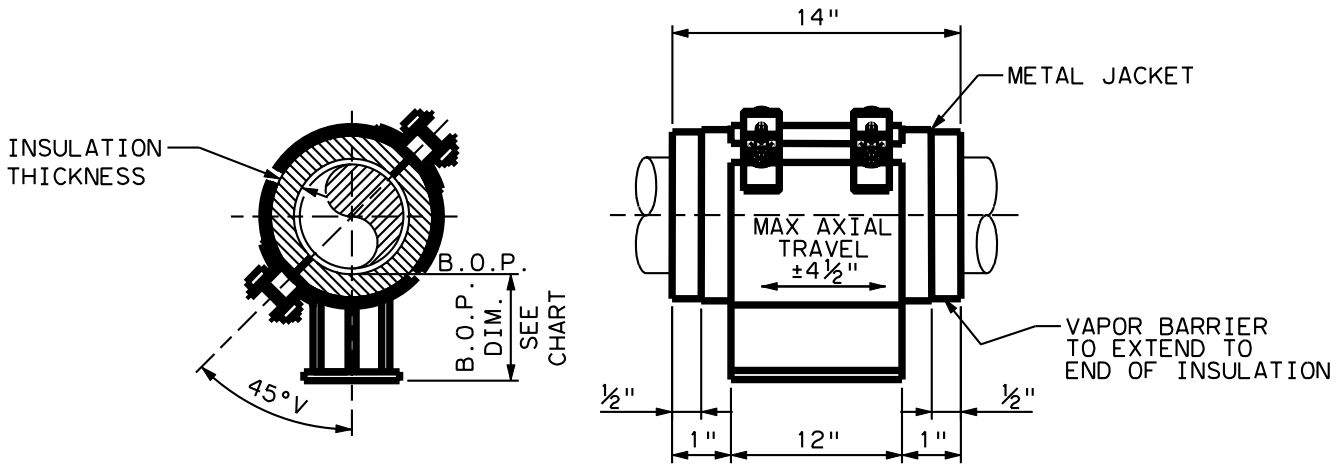
PIPE SIZE	P LOAD	1" INSUL "H"	1" INSUL "W"	P LOAD	1½" INSUL "H"	1½" INSUL "W"	P LOAD	2" INSUL "H"	2" INSUL "W"	P LOAD	2½" INSUL "H"	2½" INSUL "W"	P LOAD	3" INSUL "H"	3" INSUL "W"	P LOAD	3½" INSUL "H"	3½" INSUL "W"	P LOAD	4" INSUL "H"	4" INSUL "W"	P LOAD	4½" INSUL "H"	4½" INSUL "W"
½"	224#	4"	2⅛"	336#	4"	2⅞"	418#	4"	4"	551#	4"	4¾"	633#	4"	5½"	715#	4"	6¼"	797#	6"	6⅞"	879#		7½"
¾"	243#	4"	2⅛"	335#	4"	3"	417#	4"	4"	551#	4"	4¾"	633#	4"	5½"	716#	4"	6¼"	798#	6"	6⅞"	880#	6"	7½"
1"	297#	4"	2⅝"	379#	4"	3¼"	468#	4"	4"	553#	4"	4¾"	635#	4"	5½"	717#	4"	6¼"	799#	6"	6⅞"	881#	6"	7⅝"
1¼"	312#	4"	2⅝"	313#	4"	3⅝"	347#	4"	4"	412#	4"	4¾"	474#	4"	5½"	536#	4"	6⅛"	597#	6"	6⅞"	668#	6"	7⅝"
1½"	336#	4"	2⅞"	418#	4"	3⅝"	551#	4"	4¾"	633#	4"	5½"	715#	4"	6¼"	797#	4"	6⅞"	890#	6"	7⅝"	961#	6"	8¼"
2"	375#	4"	3¼"	463#	4"	4"	549#	4"	4¾"	631#	4"	5½"	713#	4"	6⅛"	795#	4"	6⅞"	888#	6"	7⅝"	959#	6"	8¼"
3"	464#	4"	4"	580#	4"	5"	662#	4"	5¾"	744#	4"	6½"	826#	4"	7⅛"	920#	4"	8"	1002#	6"	8⅝"	1076#	6"	9¼"
4"	549#	4"	4¾"	631#	4"	5½"	713#	4"	6⅛"	795#	4"	6⅞"	889#	4"	7⅝"	971#	4"	8⅜"	1053#	6"	9"	1158#	6"	10"
6"	1077#	4"	6⅛"	1201#	4"	6⅞"	1341#	4"	7⅝"	1465#	4"	8⅜"	1048#	4"	9"	1151#	4"	10"	1233#	6"	10⅝"	1332#	6"	11½"
8"	2004#	4"	7⅝"	2198#	4"	8⅜"	1572#	4"	9"	1727#	4"	10"	1850#	4"	10⅝"	1973#	4"	11⅜"	2096#	6"	12"	2243#	6"	12⅞"
10"	2401#	4"	9⅛"	2618#	4"	10"	2804#	4"	10⅝"	2991#	4"	11⅜"	3178#	4"	12"	3365#	4"	12¾"	3552#	6"	13½"	3801#	6"	14⅜"
12"	4162#	4"	10½"	4487#	4"	11⅜"	4767#	4"	12"	5047#	4"	12¾"	5327#	4"	13½"	5607#	4"	14¼"	3925#	6"	14⅞"	4175#	6"	15⅞"
14"	4512#	4"	11⅜"	4792#	4"	12⅛"	5072#	4"	12⅞"	5352#	4"	13½"	5632#	4"	14¼"	5912#	4"	15"	6192#	6"	15⅞"	6472#	6"	16⅜"
16"	8453#	4"	12⅞"	3568#	4"	13½"	3755#	4"	14¼"	9853#	4"	15"	6192#	4"	15⅝"	6472#	4"	16⅜"	6752#	6"	17"	7032#	6"	17¾"

NOTES:

A. RILCO MANUFACTURING CO., INC.: PART# IG-90-SL-R. OR EQUAL
B. APPLICATION: LOW TEMPERATURE PIPE SUPPORT, SINGLE LAYER INSULATION - SHOE, UNRESTRAINED ("P" LOAD ONLY).
C. TO ORDER SPECIFY: PART NO., PIPE SIZE, INSULATION THICKNESS, B.O.P. DIMENSION.
D. THIS SUPPORT CAN BE USED WITH A GUIDE. GUIDE LOAD NOT TO EXCEED 20% OF VERTICAL LOAD, USE S-32 FOR HIGHER LOADS.

S-31

PIPE SHOE 1" THRU 4½" INSULATION
LINES ½" THRU 16" TEMP. RANGE -475°F TO 275°F



ELEVATION

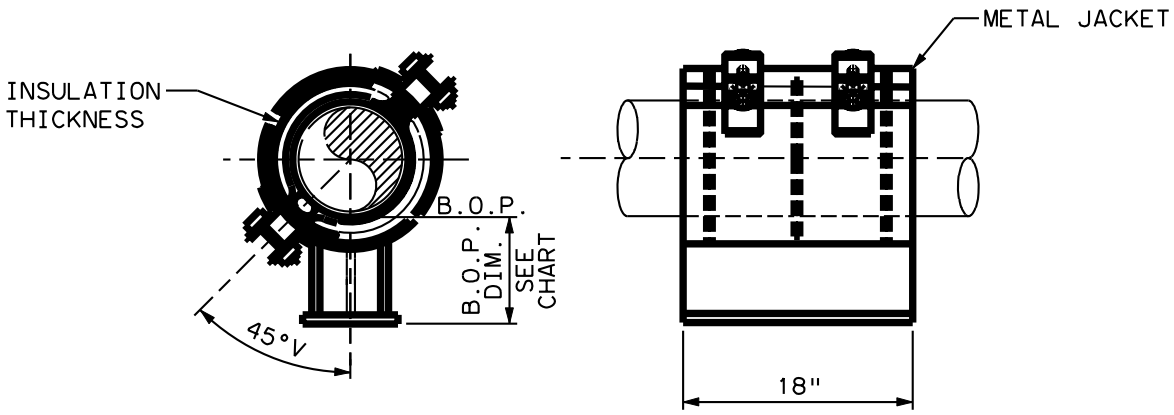
INSULATION / LOADS SCHEDULE												
PIPE SIZE	1" INSUL		1½" INSUL		2" INSUL		2½" INSUL		3" INSUL		VERTICAL LOAD	MAX LATERAL LOAD
	BOP	O.D.	BOP	O.D.	BOP	O.D.	BOP	O.D.	BOP	O.D.		
1½"	4"	4¾"	4"	5¾"	4"	7⅜"	4"	8⅜"	6"	9⅜"	210#	42#
2"	4"	5¼"	4"	6⅝"	4"	7⅜"	4"	8⅜"	6"	9⅜"	260#	52#
3"	4"	6¼"	4"	7⅜"	4"	8⅜"	4"	9⅜"	6"	10⅜"	470#	94#
4"	4"	7⅜"	4"	8⅜"	4"	9⅜"	4"	10⅜"	6"	11½"	610#	122#
6"	4"	9⅜"	4"	10½"	4"	11½"	4"	12½"	6"	13½"	1340#	268#
8"	4"	11½"	4"	12½"	4"	13½"	6"	14¾"	6"	15¾"	2400#	480#
10"	4"	13½"	4"	14¾"	4"	15¾"	6"	16¾"	6"	16¾"	3100#	620#
12"	4"	15¾"	4"	16¾"	4"	17¾"	6"	18¾"	6"	19¾"	6000#	1200#
14"	4"	17⅛"	4"	18⅛"	4"	19⅛"	6"	20⅛"	6"	21⅛"	6600#	1320#
16"	6"	19⅛"	6"	20⅛"	6"	21⅛"	6"	22⅛"	6"	23⅛"	7600#	1520#
18"	6"	21⅛"	6"	22⅛"	6"	23⅛"	6"	24⅛"	6"	25⅛"	8500#	1700#

NOTES:

A. RILCO MANUFACTURING CO., INC.: PART# CG-4100 OR EQUAL.
B. APPLICATION: LOW TEMPERATURE SLIDING SUPPORT/GUIDE, HEAVY DUTY.
C. TO ORDER SPECIFY: PART NO., PIPE SIZE, INSULATION THK., VERTICAL AND LATERAL LOAD, AXIAL MOVEMENT, AND OPERATING TEMPERATURE.
D. USE THIS SUPPORT ONLY IF GUIDE LOADS EXCEED S-31.

S-32

SLIDING PIPE SHOE GUIDE FOR COLD LINE
LINES 1½" THRU 18" (HEAVY DUTY)
TEMP. RANGE - 275° F TO 425° F



ELEVATION

INSULATION / LOADS SCHEDULE									
PIPE SIZE	VERTICAL LOAD	2" INSUL		2½" INSUL		3" INSUL		MAX. LOAD	
		BOP	O.D.	BOP	O.D.	BOP	O.D.	AXIAL	LATERAL
2"	260#	4"	7⅜"	4"	8⅜"	6"	9⅜"	550#	52#
3"	470#	4"	8⅜"	4"	9⅜"	6"	10⅜"	650#	94#
4"	610#	4"	9⅜"	4"	10⅜"	6"	11½"	760#	122#
6"	1340#	4"	11 ⅞"	4"	12⅞"	6"	13⅞"	1510#	268#
8"	2400#	4"	13⅞"	6"	15⅛"	6"	16⅛"	1860#	480#
10"	3100#	4"	16⅛"	6"	17⅛"	6"	18⅛"	2370#	620#
12"	6000#	4"	18½"	6"	19½"	6"	20½"	4570#	1200#
14"	6600#	4"	19½"	6"	20½"	6"	21½"	4370#	1320#
16"	7600#	4"	21½"	6"	22½"	6"	23½"	4910#	1520#
18"	8500#	4"	23½"	6"	24½"	6"	25½"	5460#	1700#

NOTES:

A. RILCO MANUFACTURING CO., INC.: PART# CA-4100 OR EQUAL.

B. APPLICATION: LOW TEMPERATURE SUPPORT/ANCHOR, HEAVY DUTY.

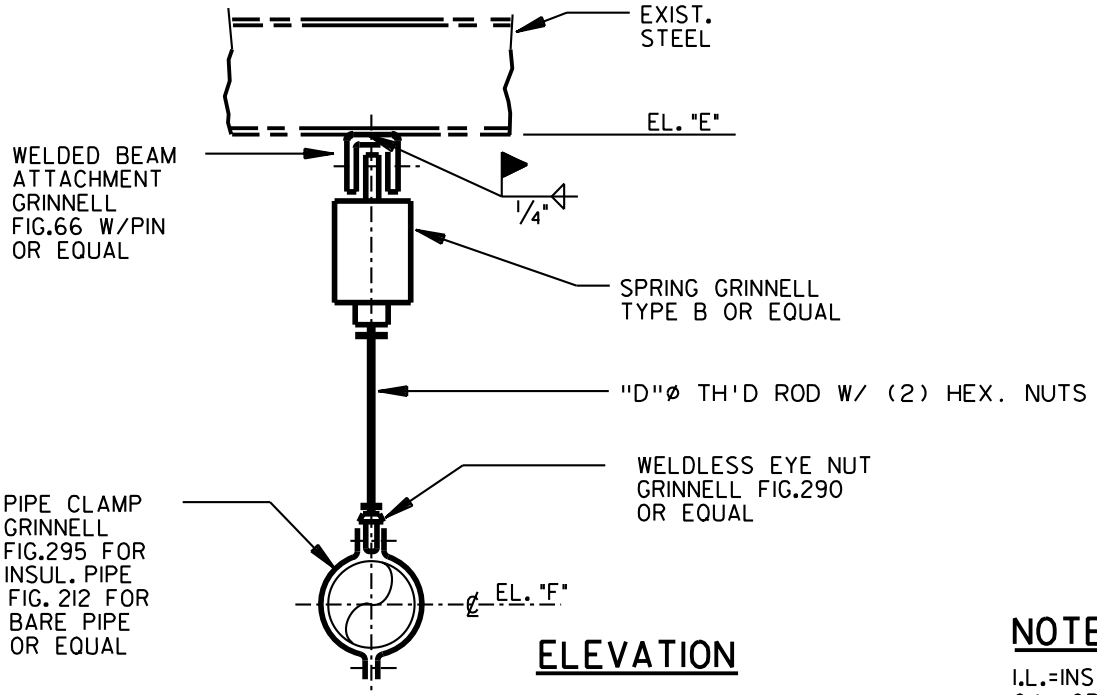
C. TO ORDER SPECIFY: PART NO., PIPE SIZE, INSULATION THK., VERTICAL, AXIAL AND LATERAL LOAD, AND OPERATING TEMPERATURE.

D. SEE RILCO ASSEMBLY/INSTALLATION DWG. NO. R-A-97.

S-33

PIPE SHOE ANCHOR FOR COLD LINE
LINES 2" THRU 18" (HEAVY DUTY)

ENGINEERED PIPE SUPPORTS

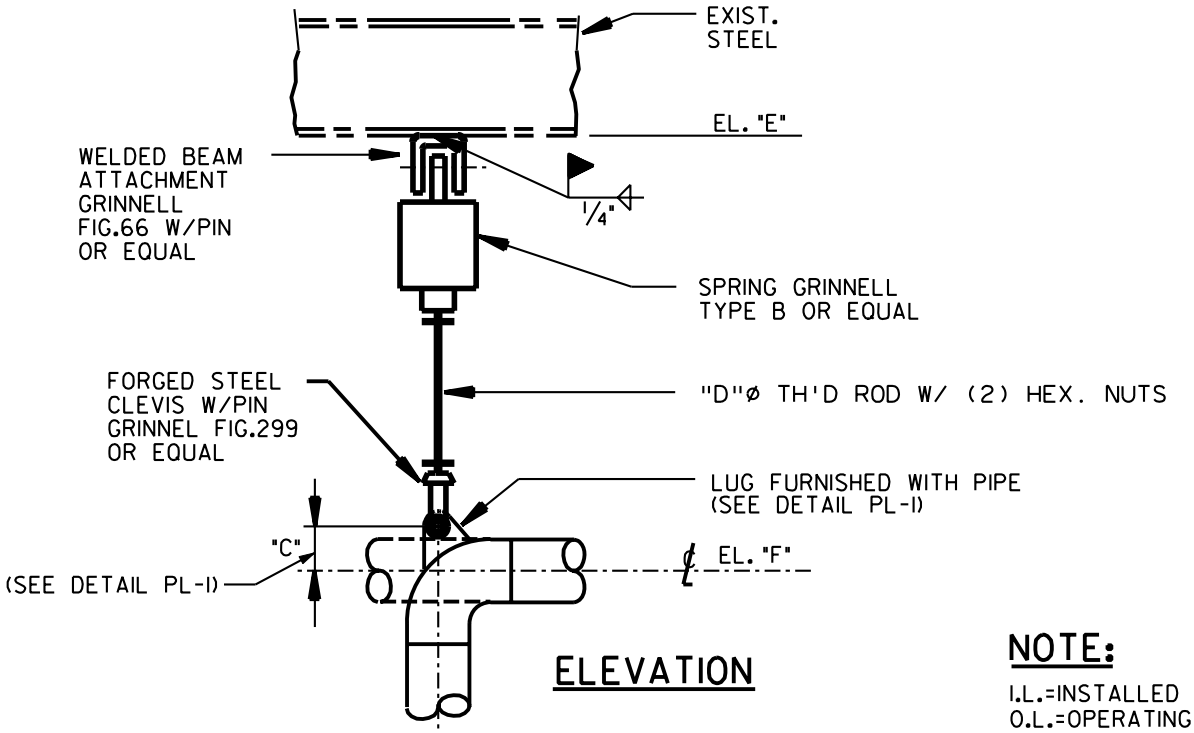


ELEVATION

NOTE:

I.L.=INSTALLED LOAD (LBS)
O.L.=OPERATING LOAD (LBS)

SUPPORT TAG NO.	LINE NO.	LOCATION DWG. NO.	NO. REQ'D.	ELEVATION		SPRING DATA					D ø	REV.
				E	F	FIG.	SIZE	MVT.	O.L.	I.L.		

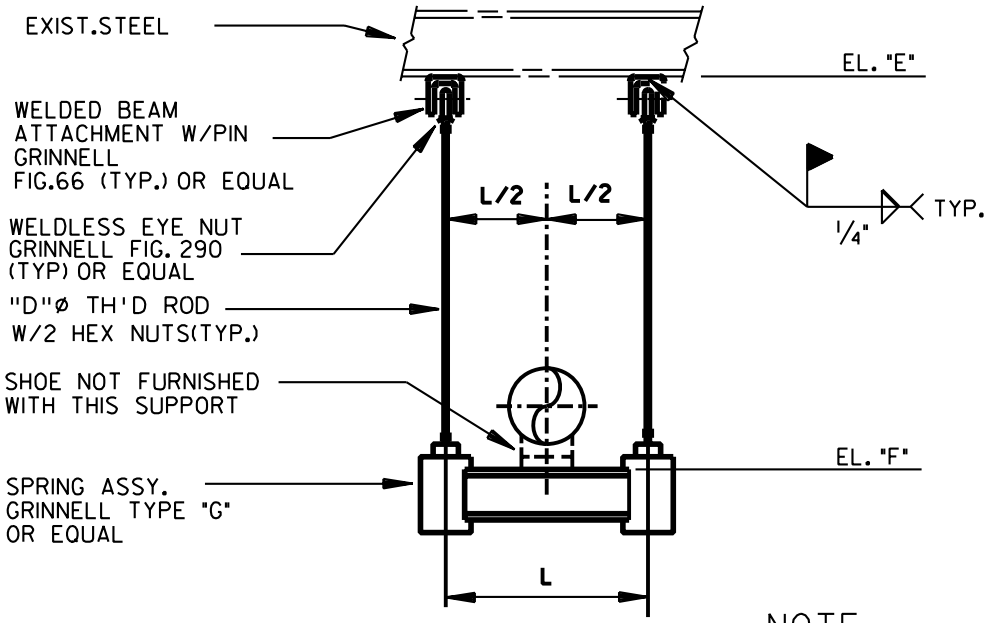


ELEVATION

NOTE:

I.L.=INSTALLED LOAD (LBS)
O.L.=OPERATING LOAD (LBS)

SUPPORT TAG NO.	LINE NO.	LOCATION DWG. NO.	NO. REQ'D.	ELEVATION		SPRING DATA					D ø	C	REV.
				E	F	FIG.	SIZE	MVT.	O.L.	I.L.			

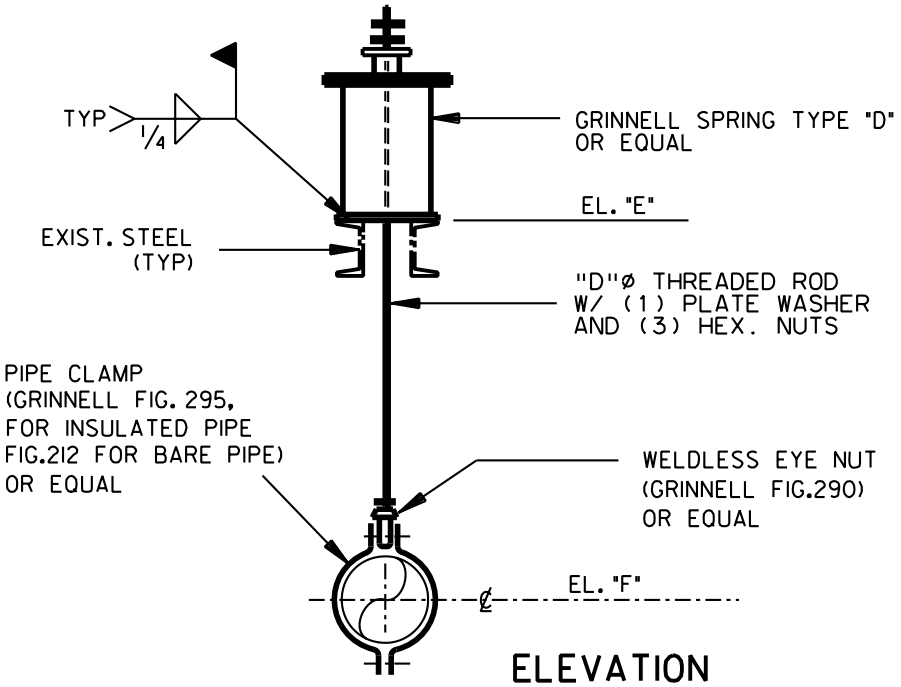


ELEVATION

NOTE:

I.L.=INSTALLED (COLD) LOAD, LBS PER SPRING
O.L.=OPERATING (HOT) LOAD, LBS PER SPRING

SUPPORT TAG NO.	LINE NO.	LOCATION DWG. NO.	NO. REQ'D.	ELEVATION		SPRING DATA						D ø	REV.
				E	F	FIG.	SIZE	MVT.	O.L.	I.L.	L		

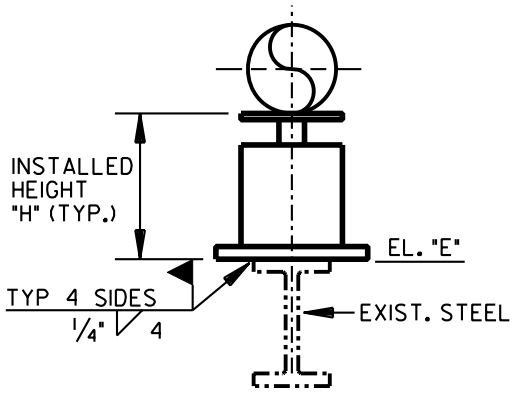


ELEVATION

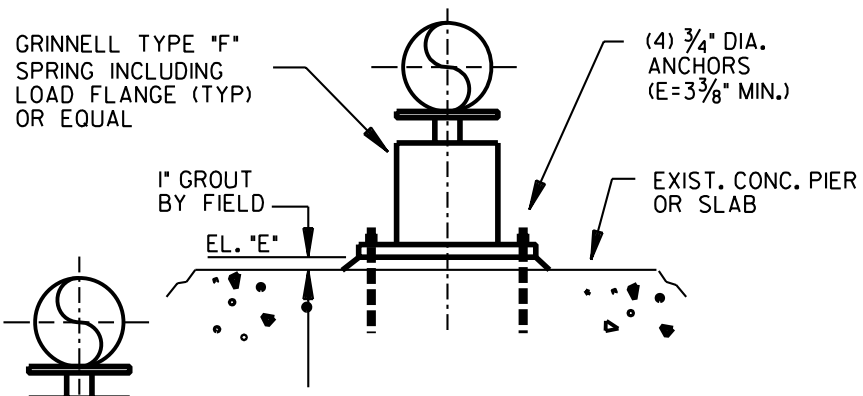
NOTE:

I.L.=INSTALLED LOAD, (LBS)
O.L.=OPERATING LOAD, (LBS)

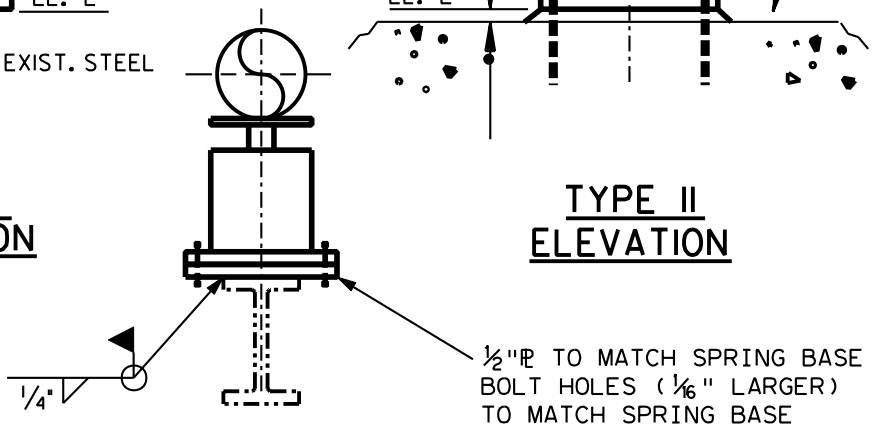
SUPPORT TAG NO.	LINE NO.	LOCATION DWG. NO.	NO. REQ'D.	ELEVATION		SPRING DATA					D ø	REV.
				E	F	FIG.	SIZE	MVT.	O.L.	I.L.		



TYPE I
ELEVATION



TYPE II
ELEVATION

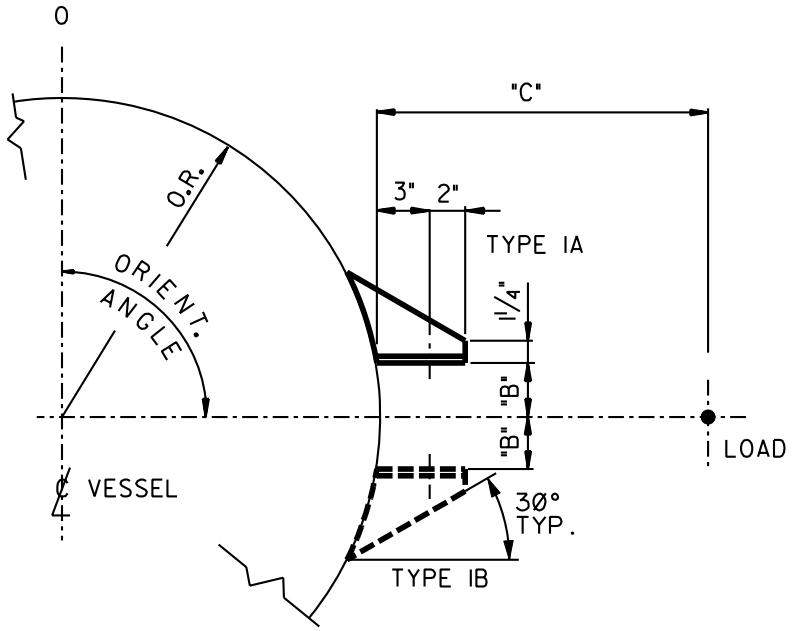


ALTERNATE

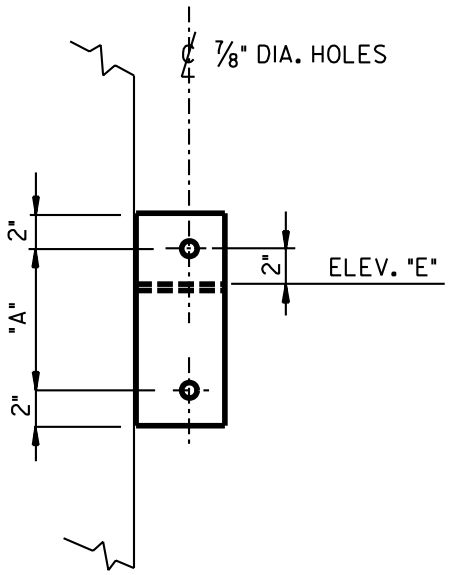
NOTE:

I.L.=INSTALLED LOAD (LBS)
O.L.=OPERATING LOAD (LBS)

SUPPORT TAG NO.	LINE NO.	LOCATION DWG. NO.	NO. REQ'D.	ELEVATION	SPRING DATA						TYPE	REV.
					FIG.	SIZE	MVT.	O.L.	I.L.	H		



PLAN



ELEVATION

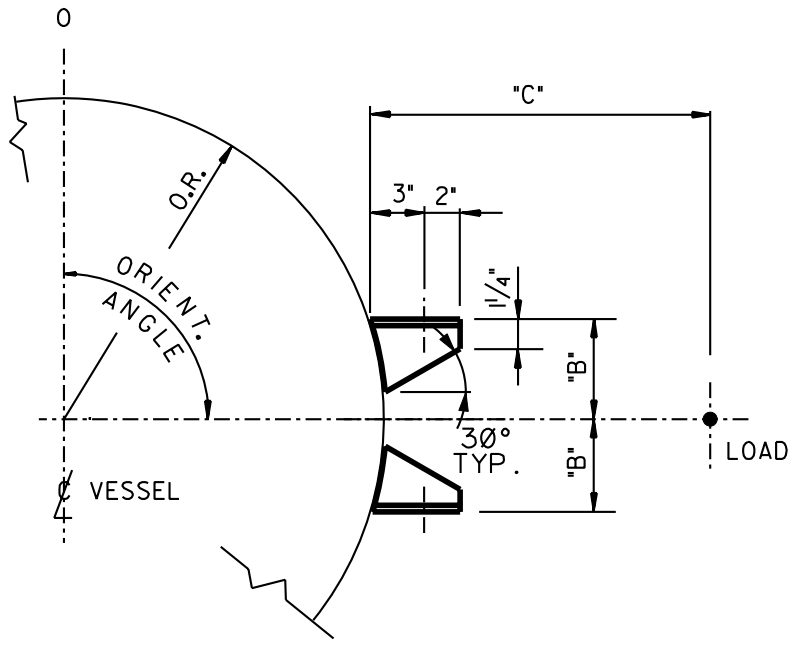
VESSEL MK NO.	CLIP TYPE	LINE NO.	ORIENT. ANGLE	ELEV. E	O.R.	DIMENSION			LOAD (LBS.)		REMARKS
						A	B	C	VERT.	HORIZ.	

NOTES :

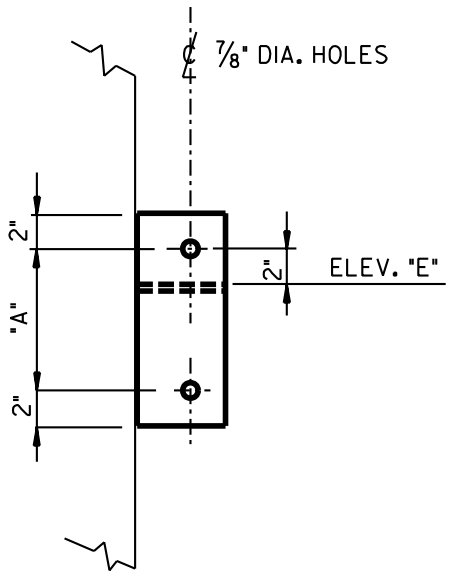
1. VESSEL VENDOR TO CONFIRM CLIP DESIGN.
2. CLIP PLATES TO BE 3/8" THICK MIN. AND TO BE FABRICATED OF THE SAME MATERIAL AS THE METAL TO WHICH THEY ARE BEING WELDED.
3. PLATES ARE TO BE WELDED TO EACH OTHER AND TO THE SHELL WITH CONTINUOUS 3/8" FILLET WELDS.
4. ORIENTATION ANGLE IS MEASURED CLOCKWISE FROM REFERENCE 0 DEG.

VC-1

VESSEL CLIP
TYPE 1A & 1B
(SEE SECTION 10.3)



PLAN



ELEVATION

VESSEL MK NO.	LINE NO.	ORIENT. ANGLE	ELEV. E	O.R.	DIMENSION			LOAD (LBS.)		REMARKS
					A	B	C	VERT.	HORIZ.	

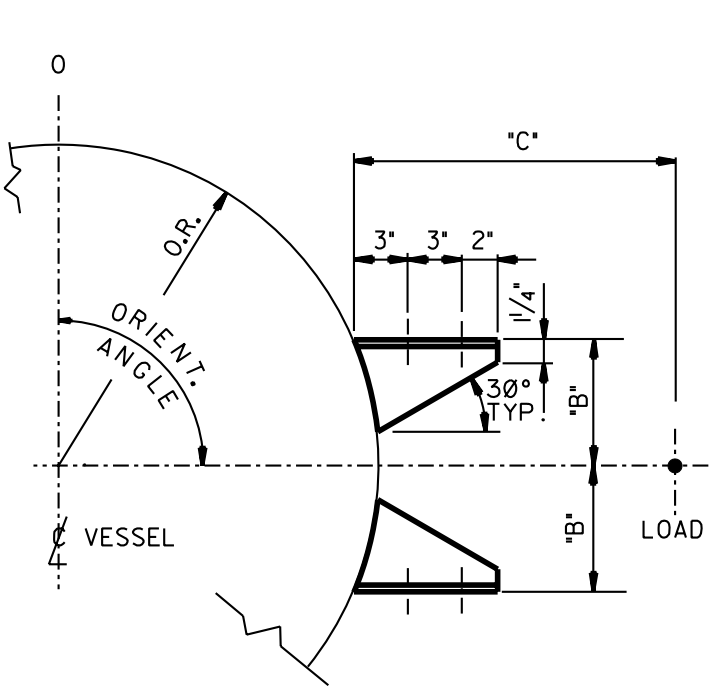
NOTES :

1. VESSEL VENDOR TO CONFIRM CLIP DESIGN.
2. CLIP PLATES TO BE ⅜" THICK MIN. AND TO BE FABRICATED OF THE SAME MATERIAL AS THE METAL TO WHICH THEY ARE BEING WELDED.
3. PLATES ARE TO BE WELDED TO EACH OTHER AND TO THE SHELL WITH CONTINUOUS ⅜" FILLET WELDS.
4. ORIENTATION ANGLE IS MEASURED CLOCKWISE FROM REFERENCE 0 DEG.

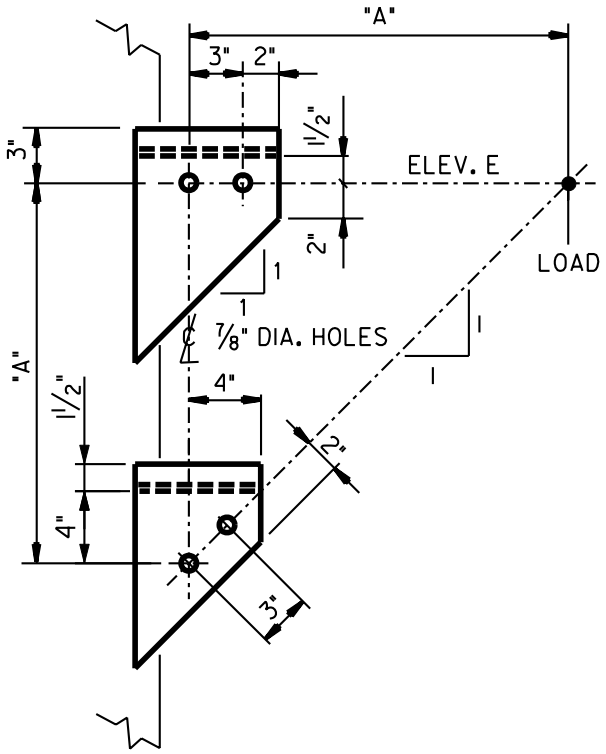
VC-2

VESSEL CLIP

(SEE SECTION 10.3)



PLAN



ELEVATION

VESSEL MK NO.	LINE NO.	ORIENT. ANGLE	ELEV. E	O.R.	DIMENSION			LOAD (LBS.)		REMARKS
					A	B	C	VERT.	HORIZ.	

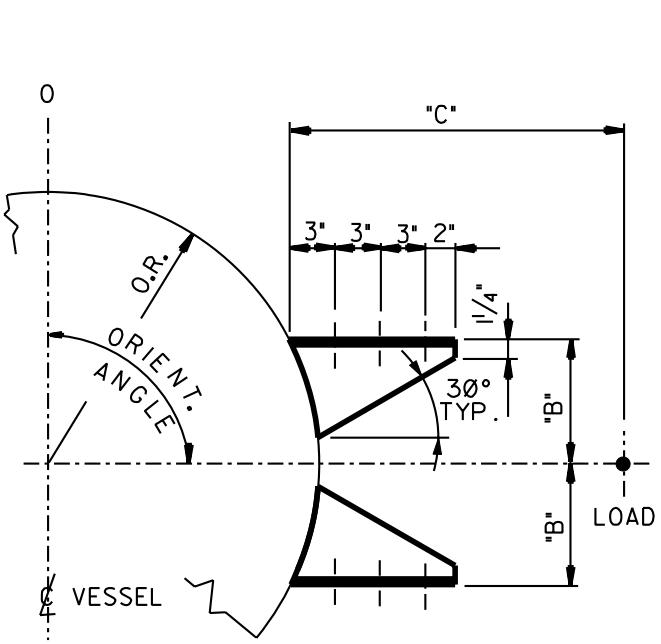
NOTES :-

1. VESSEL VENDOR TO CONFIRM CLIP DESIGN.
2. CLIP PLATES TO BE ⅜" THICK MIN. AND TO BE FABRICATED OF THE SAME MATERIAL AS THE METAL TO WHICH THEY ARE BEING WELDED.
3. PLATES ARE TO BE WELDED TO EACH OTHER AND TO THE SHELL WITH CONTINUOUS ⅜" FILLET WELDS.
4. ORIENTATION ANGLE IS MEASURED CLOCKWISE FROM REFERENCE 0 DEG.

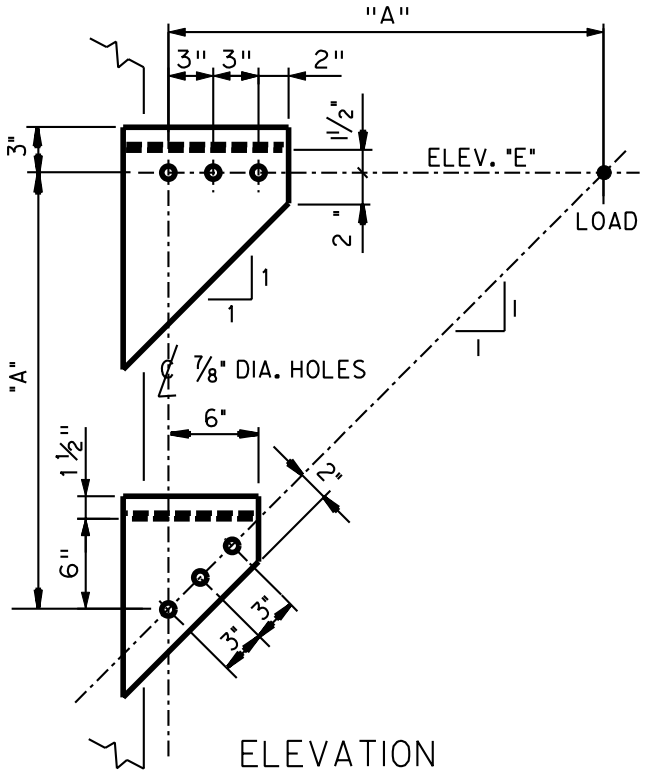
VC-3

VESSEL CLIP

(SEE SECTION 10.3)



PLAN



ELEVATION

VESSEL MK NO.	LINE NO.	ORIENT. ANGLE	ELEV. E	O.R.	DIMENSION			LOAD (LBS.)		REMARKS
					A	B	C	VERT.	HORIZ.	

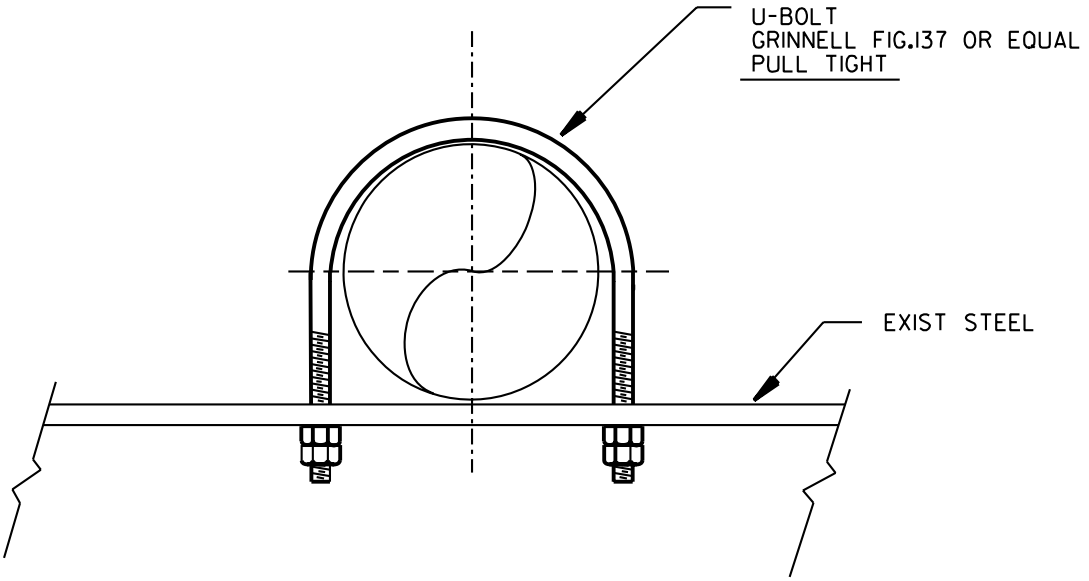
NOTES :-

1. VESSEL VENDOR TO CONFIRM CLIP DESIGN.
2. CLIP PLATES TO BE ⅜" THICK MIN. AND TO BE FABRICATED OF THE SAME MATERIAL AS THE METAL TO WHICH THEY ARE BEING WELDED.
3. PLATES ARE TO BE WELDED TO EACH OTHER AND TO THE SHELL WITH CONTINUOUS ⅜" FILLET WELDS.
4. ORIENTATION ANGLE IS MEASURED CLOCKWISE FROM REFERENCE 0 DEG.

VC-4

VESSEL CLIP

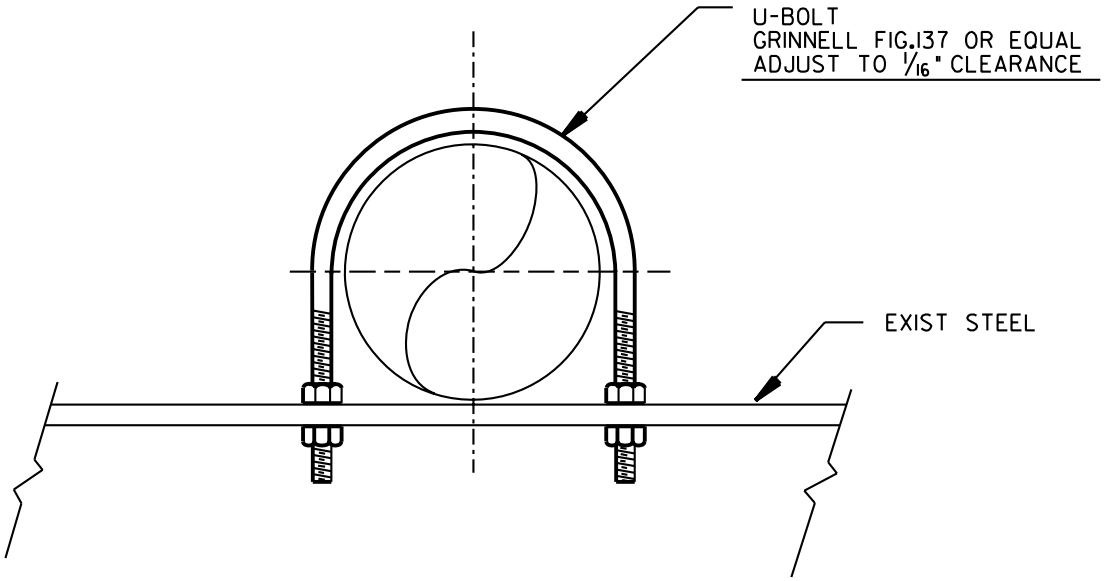
(SEE SECTION 10.3)



U-BOLT FASTENER

VERTICAL OR HORIZONTAL APPLICATION

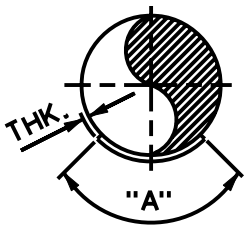
UB-F

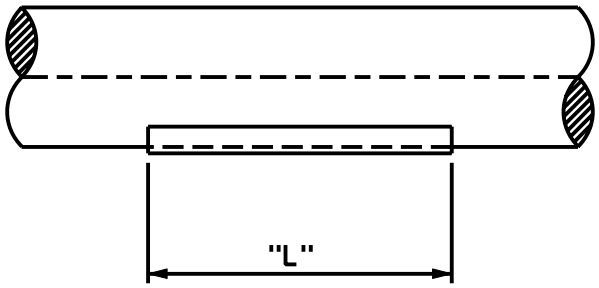


U-BOLT GUIDE

VERTICAL OR HORIZONTAL APPLICATION

UB-G





NOTE 6

PIPE SIZE	PAD THK.	STD. ANGLE "A"
½" TO 4"	¼"	90°
6" TO 10"	¼"	60°
12" TO 20"	¼"	30°
24" TO 48"	⅜"	30°

NOTES

1. ALLOWABLE TEMPERATURE RANGE -57° TO +400° F.
2. MAXIMUM COMPRESSIVE STRENGTH 40,000 PSI.
3. WEAR PAD TO BE MADE OF VINYL ESTER FIBERGLASS REINFORCED COMPOSITE MATERIAL.
4. PAD IS TO BE INSTALLED BY FIELD IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
5. WEAR PADS TO BE ADVANCED PIPING PRODUCTS "PROTEK" OR APPROVED EQUAL.
6. STANDARD LENGTHS ARE 12" & 14". OTHER LENGTHS, THICKNESSES, & DEGREES OF COVERAGE ARE AVAILABLE UPON REQUEST.

WP-1

NON-METALLIC WEAR PAD FOR UNINSULATED LINES