LB&A, INC

LINN BROWN & ASSOCIATES

A UTILITY SERVICE COMPANY

PIPELINE BRIDGE CROSSING PRODUCTS

REPRESENTATIVE:

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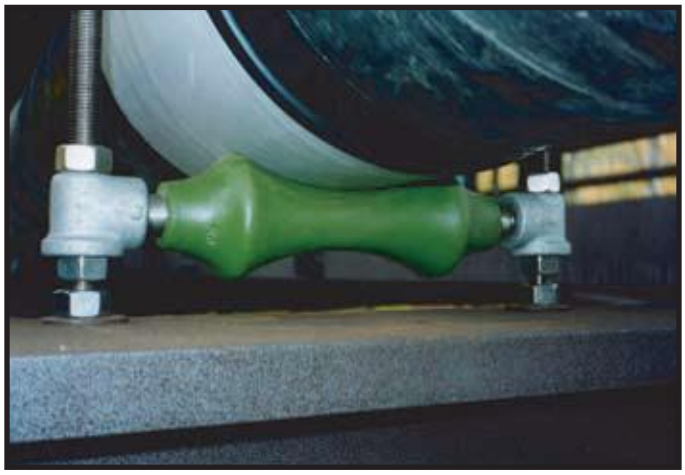
PRODUCTS CATALOG

NON-CONDUCTIVE PIPE ROLLERS

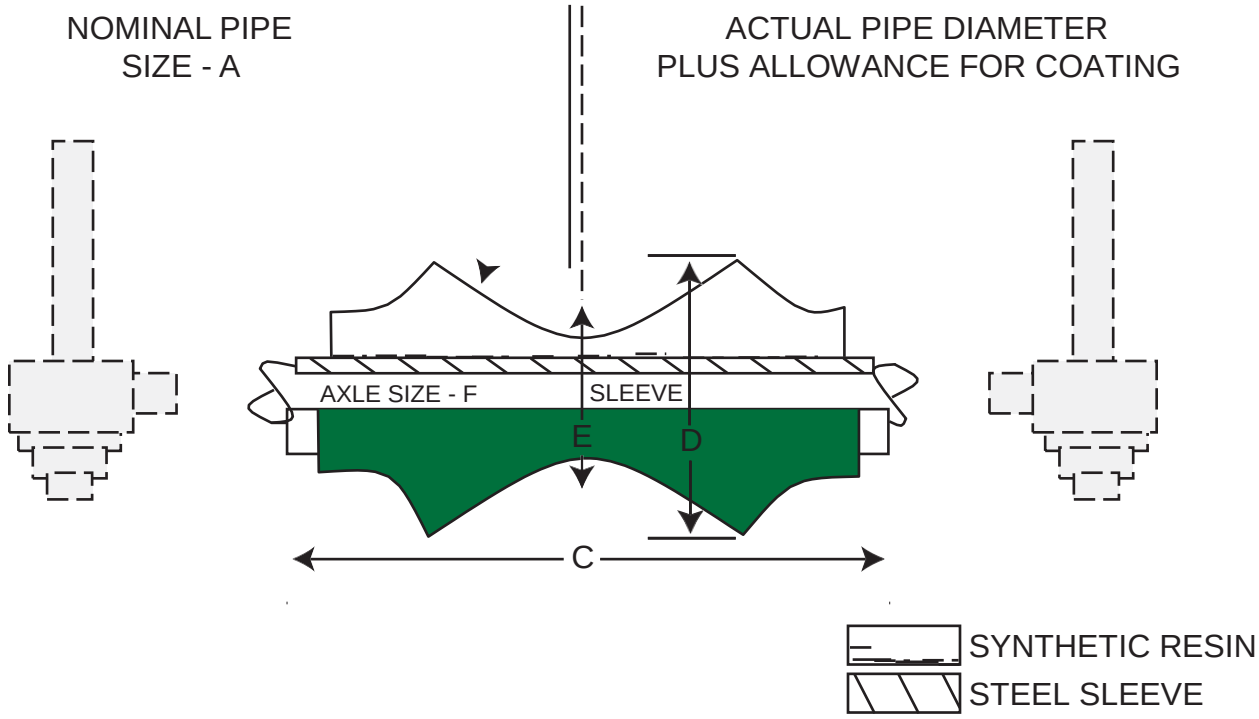
PREVENT THE PASSING OF CURRENT FROM THE PIPELINE TO BRIDGE STRUCTURE, REBARS, ETC.



Can be used in conjunction with
FRP Type #240 Roll-On Shields™

- Maintain same support strength of pipe hanger system
- Eliminate chafing and rusting pipe caused by iron rolls
- Eliminate electrical grounding of the pipeline to the bridge
- Eliminate insulting joints at each end of bridge, and include the suspended line as part of the cathodically protected pipeline, i.e., continuity of cathodic protection.
- Absorb vibration from traffic of other sources, saving wear and tear on pipe hanger parts.
- Highest specification polyurethane compound is cast around an integral steel sleeve to form a full length bearing for the axle.
- Direct replacement for cast iron roll.

NON-CONDUCTIVE PIPE ROLLER DIMENSIONS
HANGER MOUNTED MODEL



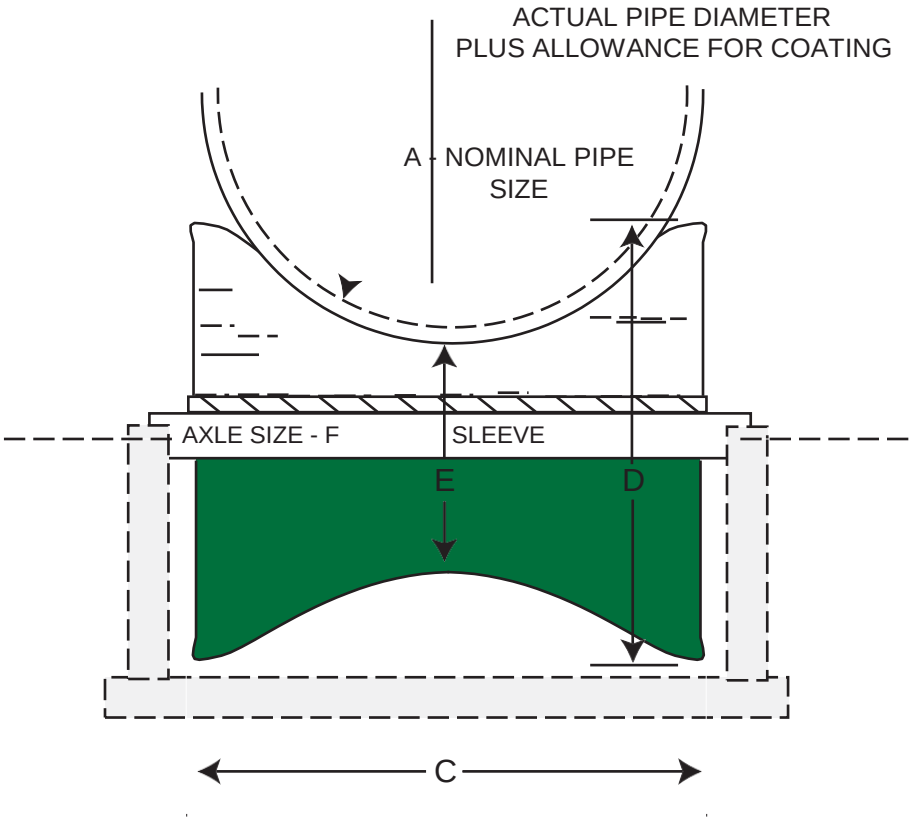
HANGER RODS, NUTS, SOCKETS AND
AXLE ARE DESCRIBED IN OUR PIPE HANGER CATALOG

(IN INCHES)

MODEL NUMBER	NOMINAL PIPE SIZE - A	C	D	E	F
2 H	2	2 5/8	1 1/4	13/16	3/8
2 1/2 H*	2 1/2	3 1/4	1 1/2	7/8	1/2
3 H	3	3 3/4	1 5/8	7/8	1/2
4 H	4	4 3/4	2	1 1/2	1/2
5 H	5	5 13/16	2 3/8	1 1/2	5/8
6 H	6	6 7/8	2 3/4	1 3/4	3/4
8 H	8	8 7/8	3 1/8	2 1/8	7/8
10 H	10	11	3 5/8	2 1/8	7/8
12 H	12	12 1/2	4	2 1/8	1
14 H	14	14 1/2	4 1/2	2 1/2	1 1/8
16 H	16	16 1/4	5	2 5/8	1 1/4
18 H	18	18 3/8	5 9/16	2 3/4	1 1/4
20 H	20	20 1/4	5 3/4	3 1/2	1 1/4
24 H	24	24 1/4	7 1/16	4 1/8	1 1/2
LARGER SIZES ON SPECIAL ORDER					

*SPECIAL ORDER

NON-CONDUCTIVE PIPE ROLLER DIMENSIONS
STAND MOUNTED MODEL



(IN INCHES)

MODEL NUMBER	NOMINAL PIPE SIZE - A	C	D	E	F
2 S	2	2 5/8	2	13/16	1/2
3 S	3	2 5/8	2 1/8	1 1/8	1/2
4 S	4	3 3/4	2 9/16	1 1/8	1/2
5 S	5	3 3/4	2 3/8	1 1/8	1/2
6 S	6	3 3/4	2	1 1/8	1/2
8 S	8	6	3 3/8	1 3/8	3/4
10 S	10	6	3 1/8	1 5/8	3/4
12 S	12	8	3 7/8	2 3/4	7/8
14 S	14	9 1/8	4	2 3/4	7/8
16 S	16	9	3 7/8	1 3/4	1 1/8
18 S	18	9	4	1 15/16	1 1/8
20 S	20	9	4	1 7/8	1 1/8
24 S	24	10	4 7/16	2 1/4	1 1/4
SPECIAL ORDER ROLLERS AVAILABLE ON QUOTE BASES.					

*SPECIAL ORDER

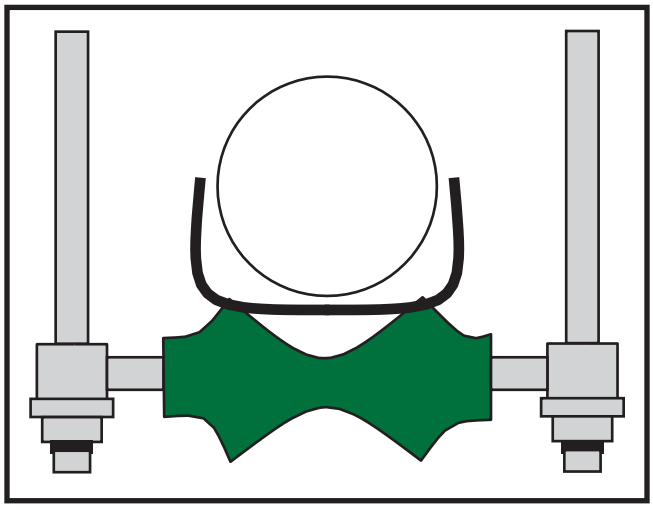
PHYSICAL PROPERTIES LIST

We list below the key properties of the casting compound we use in our NON-CONDUCTIVE PIPE ROLLERS. We suggest that you accept no less a standard of excellence in order to have long term durability, weatherability and performance.

A roller that has cold flowed under the load placed upon it (time, temperature and weight) will develop a flat spot and cease to roll. A bound roller will pull the whole support system out of line, first in one direction and then in the other, resulting in metal fatigue and ultimate failure. A small economy in the price of your rollers can cost a thousand times the "saving" in a failed support system.

CUSTOM COMPOUNDED
POLYETHER TYPE POLYURETHANE

Hardness, Shore A	98
Tensile Modulus, psi at 100%	2542
Tensile Strength, psi	6764
Elongation, %	247
Die C Tear, pli	477
Spit Tear, pli	130
Compression Set, Method B, %	21
Bashore Resilience, %	39
Compression Modulus, psi: at 5%	500
at 10%	850
at 15%	1175
at 20%	1600
at 25%	2125



FRP Roll-On Shields™

FRP Roll-On Shields stop electrolytic wear of suspended or overhead pipe mains effectively and economically. Roll-On Shields also provide coated mains with abrasion protection and desirable weight distribution at each roller hanger or support.

General Description:

Roll-On Shields are a fiberglass reinforced plastic, $^{2}/_{3}$ circular, pre-shaped method of electrical isolation for suspended pipe mains. They also are a means of abrasion control on coated pipes and are generally adaptable to any hanger or support.

Are These Your Problems?

Pipe mains, particularly those suspended at bridge crossings, have had consistent problems with vibration and movement causing the hangers to chafe or abrade through the main pipe coating. Resultant wear electrically grounds pipe to the supporting structure causing electrolytic corrosion and wearing action.

The inevitable point loading that takes place against the supports also creates a "cold flow" problem for the pipe coatings.

The Solution...

The application and use of FRP Roll-On Shields at each pipeline hanger and support. They are an inexpensive, quick and easy method for dealing with and preventing these problems.

The placement of FRP Roll-On Shields between a coated main and its hanger or support provides electrical isolation as well as desirable weight distribution and a high degree of abrasion resistance. Without this protection, the cold flow of the coating combined with the thermal expansion and contraction of the pipe would result in holidays at each support assembly.

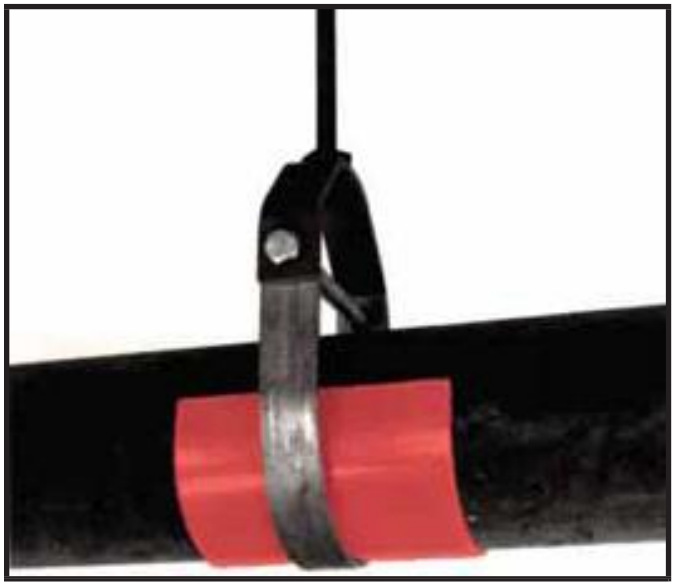
Printed in U.S.A.

Advantages and Benefits of FRP Roll-On Shields:

- Easy to Install - Simply snap on and slide into place.
- The shields can be installed as an electrical insulator between buried steel pipes that are run parallel or may touch each other.
- No tools, banding, welding or adhesives are required.
- Hanger disassembly not required on existing pipelines.
- 240° peripheral grip holds FRP Roll-On Shield in place even when clear of supporting structures.
- Roll-On Shields are durable, flexible and light weight for ease of handling, installation or storage. Their flexibility automatically compensates for most pipeline diameter variations including coating and coverings.
- Easily installed on existing pipelines; ideally suited for new construction.
- Significantly less expensive than insulated rollers.

Roll-On Shields Application Instructions:

1. With two hands, simply snap the shield onto the pipe at desired location and slide into place.
2. Be sure shield is centered on the hanger to allow for any pipeline movement.
3. Observe all necessary safety precautions when working at high elevations.
4. Epi-SEAL® Epoxy Seam Sealer is sometimes used to seal the corresponding surfaces of Roll-On Shields and uncoated mains.



FRP Roll-On Shield's unique 240° peripheral design is shown on insulated pipe with clevis hanger.

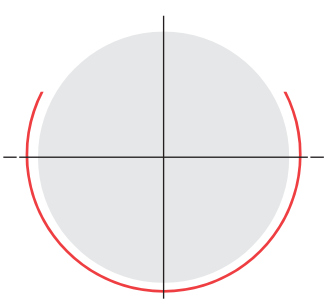
Roll-On Shield Sizes*

Shield Nos.	Fit Pipe Diams. (Nominal)	Shield Length
2	2”	6”
4	4”	6”
6	6”	9”
8	8”	12”
10	10”	12”
12	12”	12”
16	16”	12”
18	18”	12”
20	20”	12”
24	24”	12”
30	30”	12”
36	36”	12”
*42	*42”	12”
*48	*48”	12”

* Special Order

Custom lengths and thicknesses available on a quote basis.

NOTE: Please see separate insert sheet for current FRP Roll-On Shield specifications, physical properties and dimensional data.



ADJUSTABLE PIPE ROLL STANDS

Crevice corrosion typically occurs on above grade piping at each support contact. Moisture and corrosive debris tends to collect at the pipe/support contact and over time, corrode the pipe's steel surface to the point it must be repaired or replaced.

Adjustable Roller Stands, used in conjunction with **Non-Conductive Rollers,** offers an alternative to the epoxy type pipe chocks for preventing or correcting crevice corrosion problems.

The polyurethane based Non-Conductive Rollers will not abrade the pipe's coating and allows moisture to drain away from the bottom of the pipe. Non-Conductive Rollers do not contact enough of the pipe surface to allow moisture or organic materials (grass clippings, leaves, pine needles, etc) to collect at the pipe roller interface. **Non-Conductive Rollers are particularly useful on pipes that show significant expansion and contraction.**

The Adjustable Pipe Roll Stand generally includes a galvanized cast iron base, steel plate, adjusting bolts and Non-Conductive Roller with stainless steel sleeve.

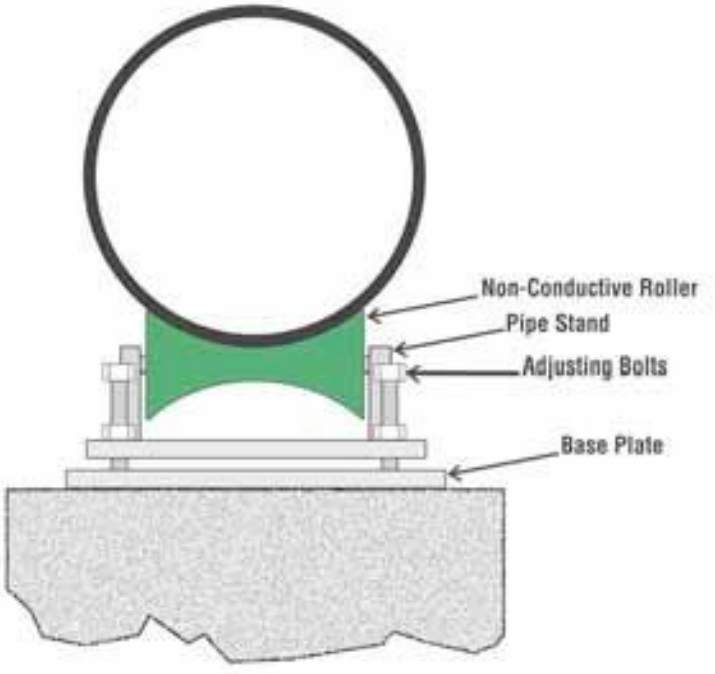
The base can also be fabricated from carbon or stainless steel to standard or non-standard specifications.

Available for pipe sizes 2" through 24"

Regulations require the removal of any installed pipe chocks and hold down straps for periodic corrosion inspection of the pipes surface.

Although the **Adjustable Roll Stand** can easily be lowered it probably would not be necessary because every square inch of the pipe surface is visible. Due to the normal seasonal expansion and contraction there is no part of the pipe's surface hidden from view.

CALL, FAX, OR E-MAIL FOR COMPLETE INFORMATION.



BLUECOAT

PIPE HANGER & SUPPORT HARDWARE COATING

General Description

BlueCoat is a fastener class coating material. This fluoropolymer based material is a waterborne/VOC-compliant, resin bonded, thermally cured, single film coating. It is primarily formulated for use on fasteners to prevent corrosion. BlueCoat is applied with specialized equipment, under controlled conditions, by a licensed applicator for shipment to the customer.

BlueCoat offers a superior alternative to zinc plated, hot dipped, 304 stainless steel and 316 stainless steel pipe support hardware.

Substrate Information

BlueCoat is applied to numerous substrates such as steel, aluminum, brass, high alloy steels, stainless steel, titanium and zinc plating.

Temperature Range

BlueCoat can be used continuously from -58^{0}F (-50^{0}C) to +350^{0}F (+176^{0}C) and can resist +400^{0}F (+204^{0}C) intermittently.

Corrosion Resistance

BlueCoat applied at 1 mil dry film thickness, over zinc phosphated steel panels, has exceeded 1500 hours of ASTM B-117 salt fog test. Far superior to zinc plated, cadmium plated and hot dip galvanized steel substrates.

Physical Properties

Pencil Hardness	2-3 H
Dielectric Strength	500 V/mil
Coefficient of Friction	.05 – 0.10

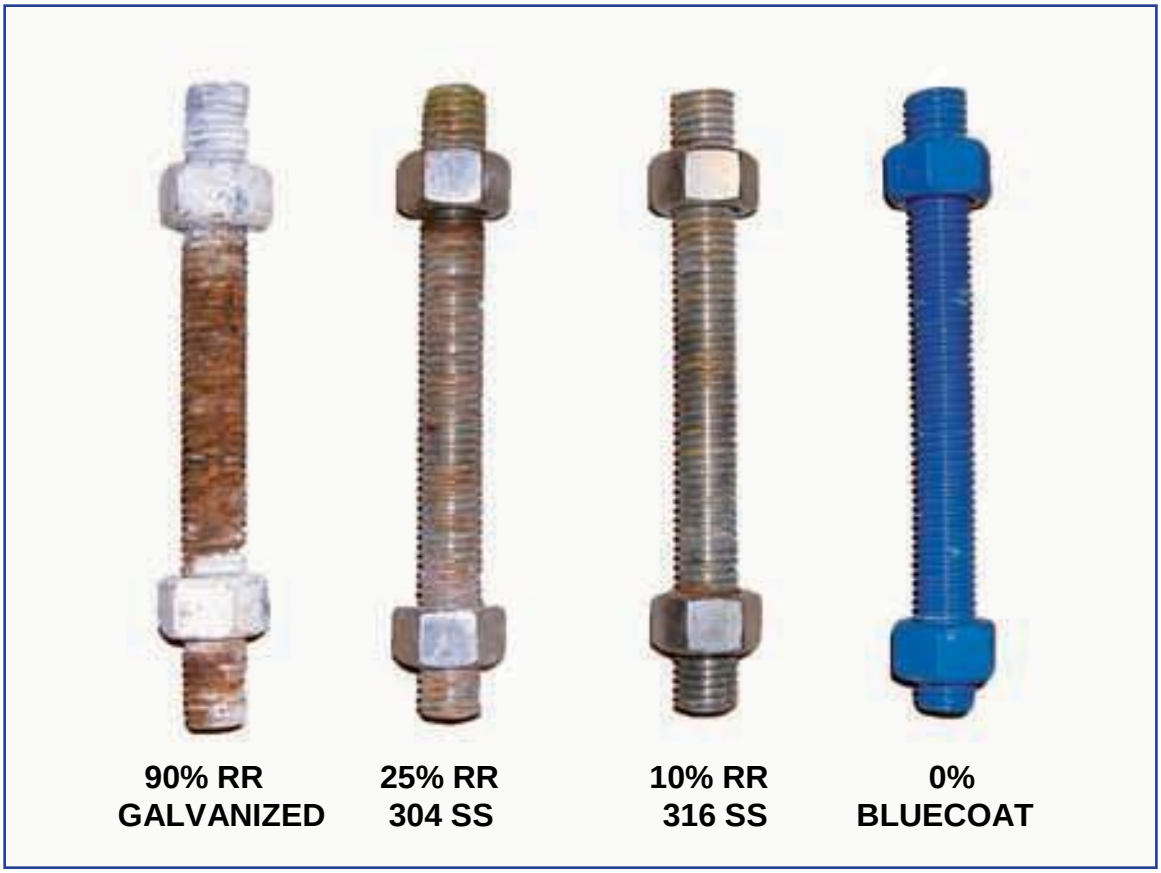
Chemical Resistance

BlueCoat will withstand most solvents, waters, automotive fluids and fuels up to 200^{0}F

ASTM B117 Salt Spay Test

BlueCoat treated single pipe roll support after 2500 hours.

STANDARD ASTM B117 SALT SPRAY TEST @ 350 HOURS



90% RR GALVANIZED	25% RR 304 SS	10% RR 316 SS	0% BLUECOAT

15% Red Rust (RR) is considered failure.

Standard salt spray tests illustrate the superior performance of BlueCoat under extremely harsh laboratory conditions.

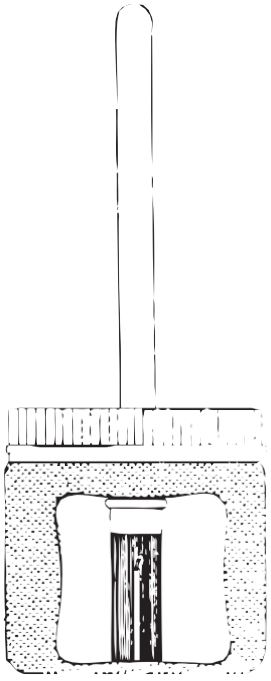
RUST-PROOF BRUSH POT

RUST-PROOF BRUSH POTS are made from durable and recyclable polyethylene. The large brush has a high carrying capacity for leak detection fluids and other liquids such as adhesives, primers, paints, oils, inks, etc. The bristles are the high quality Shanghai type China bristle. The sturdy wooden handle is permanently attached to the lid.

THE BRUSH -TOP LID IS DESIGNED FOR EASY HANDLING. OUR LID WILL NOT CORRODE SHUT TO THE POT.

Quart Dimensions
(approximate)
10” high x 5” wide

Pint Dimensions
(approximate)
9” high x 4” wide



QUART Packed 12 per case, cases cannot be broken. PINT

U-Bolt Coat

DESCRIPTION

U-Bolt Coat is a seamless, vulcanized, polyolefin material that is applied to a standard hot dipped, galvanized zinc plated or stainless steel u-bolt. They effectively control crevice corrosion on above ground piping by eliminating any possible metal to metal contact between the top and sides of the pipe. These coated u-bolts are also used with **FRP Half Rounds** to help control crevice corrosion on the bottom of a painted pipe. U-Bolt Coat type u-bolts can also help reduce vibrations and noise levels. The polyolefin coating is durable and displays excellent resistance to UV rays, heat, cold, abrasion and electrolysis.

APPLICATIONS

U-Bolt Coat type u-bolts are ideal for use on piping found in refineries, compressor stations, pumping stations, and chemical plants. They are particularly useful as non-load bearing guides on bridge mains. These coated u-bolts offer a superior long-term service life for most industrial, commercial and marine environments.

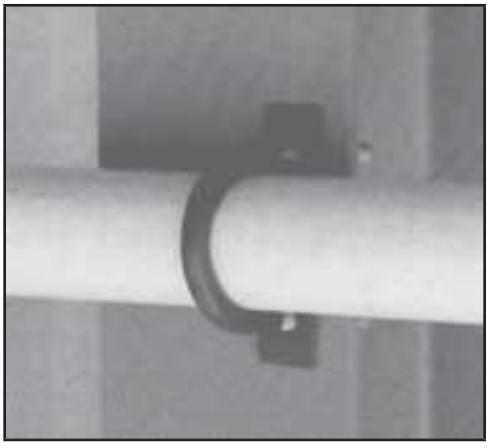
INSTALLATION

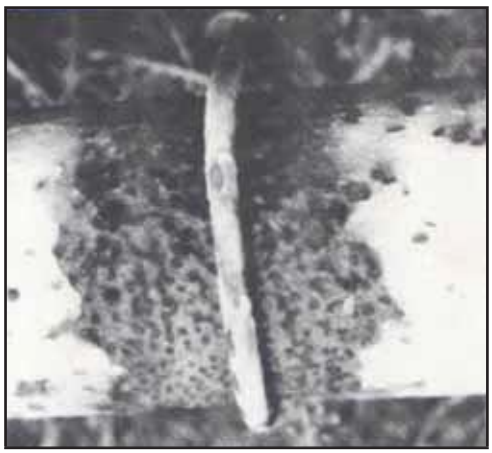
The u-bolt size and coating thickness has been taken into consideration in order to ensure a good fit over the pipe. U-BOLT COAT type u-bolts come complete with four special hot dipped galvanized hex nuts. FRP Half Rounds or FRP Flatties are frequently used in conjunction with the u-bolts. The coated u-bolts are designed to be used on bare or painted steel pipe. Thick barrier coatings and/or FRP Shields and FRP Saddles will affect proper sizing.

AVAILABILITY

- Hot dipped galvanized long tangent u-bolts ranging in size from 3/4" to 24" are standard items.
- Larger sizes and non-standard u-bolts are available on a quote basis.

REFER TO SEPARATE SHEET FOR NON-STANDARD U-BOLT COAT DIMENSIONS





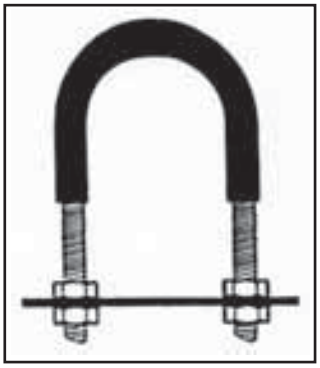
The top right picture is a typical example of accelerated corrosion occurring due to metal contact between the uncoated u-bolt and pipe. This interaction can be eliminated by utilizing U-Bolt Coat.

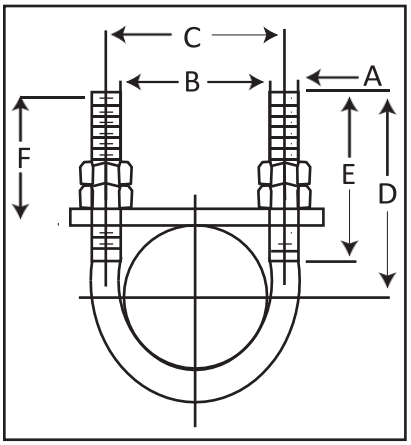
U-Bolt Coat

COATING TECHNICAL SPECIFICATIONS

Physical Properties	Value	Test Method	Chemical Properties	Value	Test Method
Tensile Strenght	1500 psi min.	ASTM D412	Water Absorption	0.2%	ASTM D570
Elongation	300% min.	ASTM D412	Corrosive Effect (16 hrs./175°F)	Pass	ASTM 2671 Copper Rod
Heating Aging (168 hrs./121°C)			Fluid Resistance (24 hrs./25°C)		
Tensile	1500 psi min.	ASTM D2671	Hydraulic Fluid (Mil-H-5606C)		
Elongation	300% min.				
Heat Shock	No Cracks, Flow or Blisters	ASTM D2671	Tensile	90% Retained Min.	ASTM D412
			Elongation	90% Retained Min.	ASTM D412
Low Temp. Flexibility	No Cracking	ASTM D2671	Lubricating Oil (Mil-L-7808G)		
(4 hrs./-55°C)		ASTM D792	Tensile	90% Retained Min.	ASTM D412
Specific Gravity	096	ASTM D792	Elongation	90% Retained Min.	ASTM D412
Temperature Limitation	200°F		Diesel Fuel (Mil-L-23699)		
			Tensile	90% Retained Min.	ASTM D412
			Elongation	90% Retained Min.	ASTM D412

When ordering be sure to account for coating and FRP Shield thickness if applicable.





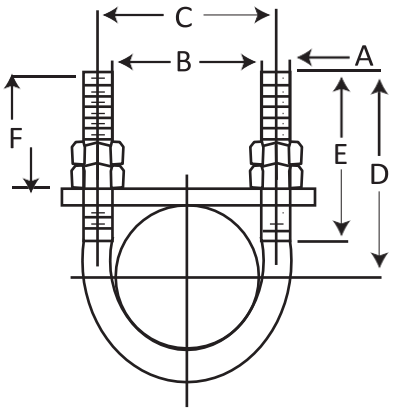
*The Coating reduces B 1/8 (.125) to 3/16 (.187)
All dimensions in inches

STANDARD U-BOLT DIMENSIONS

PIPE SIZE	ROD SIZE A	WEIGHT W/NUTS (APPROX.)	B*	C	D	E	F
3/4	1/4	.12	1 1/8	1 3/8	2 3/4	2 3/8	2 7/32
1	1/4	.12	1 3/8	1 5/8	2 3/4	2 3/8	2 3/32
1 1/4	3/8	.28	1 11/16	2 1/16	2 7/8	2 3/8	2 1/32
1 1/2	3/8	.30	2	2 3/8	3	2 1/2	2 1/16
2	3/8	.33	2 7/16	2 13/16	3 1/4	2 1/2	2 1/16
2 1/2	1/2	.73	2 15/16	3 7/16	3 3/4	3	2 5/16
3	1/2	.78	3 9/16	4 1/16	4	3	2 1/4
3 1/2	1/2	.84	4 1/16	4 9/16	4 1/4	3	2 1/4
4	1/2	.90	4 9/16	5 1/16	4 1/2	3	2 1/4
5	1/2	1.0	5 5/8	6 1/8	5	3	2 7/32
6	5/8	1.97	6 3/4	7 3/8	6 1/8	3 3/4	2 13/16
8	5/8	2.33	8 3/4	9 3/8	7 1/8	3 3/4	2 13/16
10	3/4	4.91	10 7/8	11 5/8	8 3/8	4	3
12	7/8	7.73	12 7/8	13 3/4	9 5/8	4 1/4	3 1/4
14	7/8	8.28	14 1/8	15	10 1/4	4 1/4	3 1/4
16	7/8	9.15	16 1/8	17	11 1/4	4 1/4	3 1/4
18	1	13.48	18 1/8	19 1/8	12 5/8	4 3/4	3 5/8
20	1	14.57	20 1/8	21 1/8	13 5/8	4 3/4	3 5/8
24	1	16.8	24 1/8	25 1/8	15 5/8	4 3/4	3 5/8

U-BOLT-COAT SPECIALS

NON-STANDARD DIMENSIONS



All dimensions are in inches

QUANTITY

A_____Inches

*B_____Inches

C_____Inches

D_____Inches

E_____Inches

*The coating reduces B min. 1/8" (.125) - max. 3/16" (.1875)

PIPE SIZE	ROD SIZE A	WEIGHT W/NUTS (APPROX.)	B	C	D	E	F
3/4	1/4	.12	1 1/8	1 3/8	2 3/4	2 3/8	2 7/32
1	1/4	.12	1 3/8	1 5/8	2 3/4	2 3/8	2 3/32
1 1/4	3/8	.28	1 11/16	2 1/16	2 7/8	2 3/8	2 1/32
1 1/2	3/8	.30	2	2 3/8	3	2 1/2	2 1/16
2	3/8	.33	2 7/16	2 13/16	3 1/4	2 1/2	2 1/16
2 1/2	1/2	.73	2 15/16	3 7/16	3 3/4	3	2 5/16
3	1/2	.78	3 9/16	4 1/16	4	3	2 1/4
3 1/2	1/2	.84	4 1/16	4 9/16	4 1/4	3	2 1/4
4	1/2	.90	4 9/16	5 1/16	4 1/2	3	2 1/4
5	1/2	1.0	5 5/8	6 1/8	5	3	2 7/32
6	5/8	1.97	6 3/4	7 3/8	6 1/8	3 3/4	2 13/16
8	5/8	2.33	8 3/4	9 3/8	7 1/8	3 3/4	2 13/16
10	3/4	4.91	10 7/8	11 5/8	8 3/8	4	3
12	7/8	7.73	12 7/8	13 3/4	9 5/8	4 1/4	3 1/4
14	7/8	8.28	14 1/8	15	10 1/4	4 1/4	3 1/4
16	7/8	9.15	16 1/8	17	11 1/4	4 1/4	3 1/4
18	1	13.48	18 1/8	19 1/8	12 5/8	4 3/4	3 5/8
20	1	14.57	20 1/8	21 1/8	13 5/8	4 3/4	3 5/8
24	1	16.8	24 1/8	25 1/8	15 5/8	4 3/4	3 5/8

FROM_____

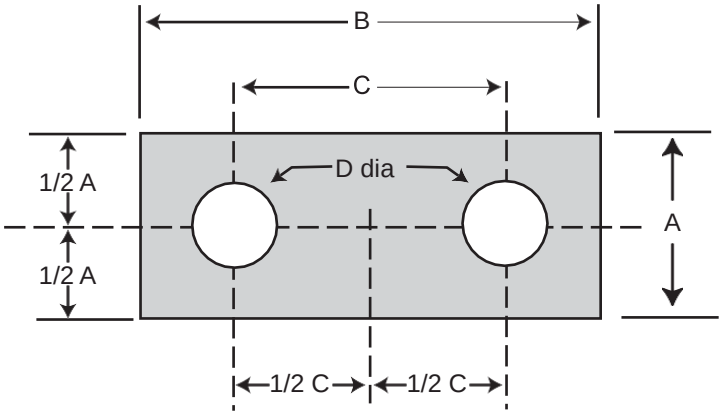
COMPANY_____

PHONE_____

FAX_____

SPECIAL COATED U-BOLT FLAT PAD DIMENSIONS

NON-STANDARD DIMENSIONS



A _____

B _____

C _____

D _____

All dimensions are in inches

STANDARD FIBERGLASS PAD DIMENSIONS*

Pipe Size	Thickness	A	B	C	D
		Pad Width	Pad Length	Centerline Hole to Centerline	Hole Diameter
1/2	1/8	1	2 3/4	1 3/16	3/8
3/4	1/8	1	2 3/4	1 3/8	3/8
1	1/8	1	2 3/4	1 5/8	3/8
1 1/4	1/8	1 1/4	4 1/4	2 1/16	1/2
1 1/2	1/8	1 1/4	4 1/4	2 3/8	1/2
2	1/8	1 1/4	4 1/4	2 13/16	1/2
2 1/2	1/8	2	7 3/4	3 7/16	5/8
3	1/8	2	7 3/4	4 1/16	5/8
3 1/2	1/8	2	7 3/4	4 9/16	5/8
4	1/8	2	8 1/2	5 1/16	5/8
5	1/8	2	8 1/2	6 1/8	5/8
6	1/8	2 1/4	9 3/4	7 3/8	3/4
8	1/8	2 1/4	11 3/4	9 3/8	3/4
10	1/8	2 1/2	14 1/4	11 5/8	7/8
12	1/8	2 3/4	17 1/2	13 3/4	1

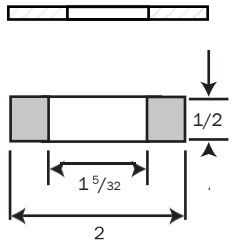
*Dimensions may vary slightly

CLEVIS INSULATOR

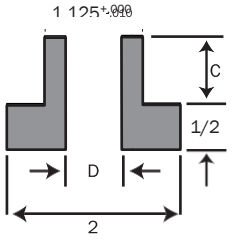
The CLEVIS INSULATOR ensures electrical isolation from the carrier pipe and its support. The insulators are generally used in conjunction with Non-Conductive Rollers.

Clevis Insulators can be used with any standard pipe hanger

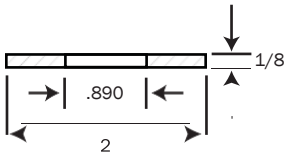
CLEVIS INSULATOR COMPONENTS



DELRIN COLLAR



DELRIN BUSHING



ST. STL. WASHER TOP & BOTTOM

DIMENSIONS

Dimensions in inches

Pipe Diameter	Hanger Rod Diameter **A**	Clevis (Yoke) Stock Size **B**	Bushing Neck Height **C**	I.D. Bushing
2”	3/8	1/4 - 2 1/2	11/16	25/64
3”	1/2	1/4 - 2 1/2	11/16	33/64
4”	5/8	1/4 - 2 1/2	11/16	41/64
5”	5/8	3/8 - 2 1/2	27/32	41/64
6”	3/4	3/8 - 2 1/2	27/32	25/32
8”	7/8	3/8 - 2 1/2	27/32	57/64
10”	7/8	1/2 - 2 1/2	31/32	57/64
12”	7/8	1/2 - 3	31/32	57/64

PHYSICAL PROPERTY COMPARISON

PHYSICAL PROPERTIES	ASTM	UNITS	DELRIN 150 E
Izod Impact (Notched) -40°F +73°F	D256	ft-lb/in	1.2 1.5
Tensile - Impact Strength	D1822 (long)	ft-lb/in2	170
Flex Modulus (0.05 in/min) -68°F +73°F	D790	kpsi	640 425
Compressive Stress +73°F @ 10% def	D695	kpsi	18
Modulus of Elasticity	D638	kpsi	450
Flexural Strength, Yield +73°F	D790	kpsi	14.3
Poisson's Ratio	____	____	.35
Shear Strength +73°F	D732	kpsi	9.5
Tensile Strength (0.2in/min) -68°F +73°F	D638	kpsi	14.7 10
Tensile Elongation at Break -68°F +73°F	D638	%	38 60
Moisture Absorption Comparison	24 hr, 50% RH 24 hr Immersion	Delrin .25% Delrin .90%	Nylon 1.2% Nylon 8.0%

PIPE HANGERS AND SUPPORT HARDWARE

None of the following pages of pipe hanger and support hardware illustrations, drawings, tables of dimensions, or other data is copyrighted. It has been in the public domain for decades. Feel free to make copies for your own use.

The following pages illustrate some of the more commonly used pipe hangers and supports. Non-Conductive Pipe Rollers may be used in lieu of the cast iron rolls in any of the following hanger and support assemblies. Non-Conductive Pipe Rollers can also be used in conjunction with Fiberglass Reinforced Type #240 Shields and Type #180 Saddles.

CONTENTS

HANGERS / SUPPORTS:

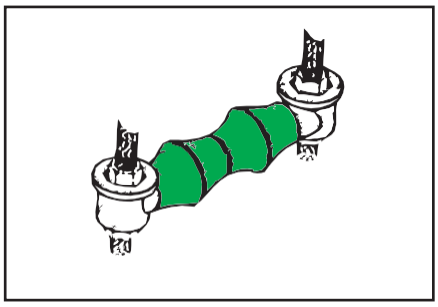
STANDS:

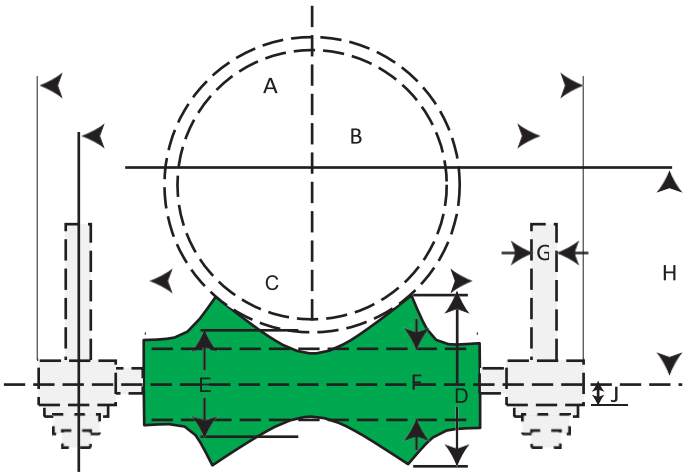
RODS / CLAMPS / BRACKETS:

SOCKETS / INSULATORS:

CONCRETE INSERTS:

SINGLE PIPE ROLL





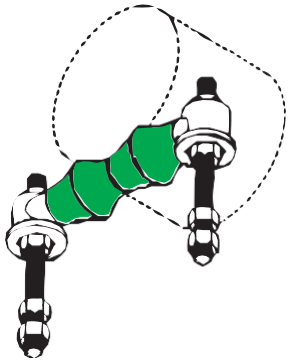
SINGLE PIPE ROLL INCLUDES:
2 ADJUSTABLE SOCKETS
1 ROLL AXLE

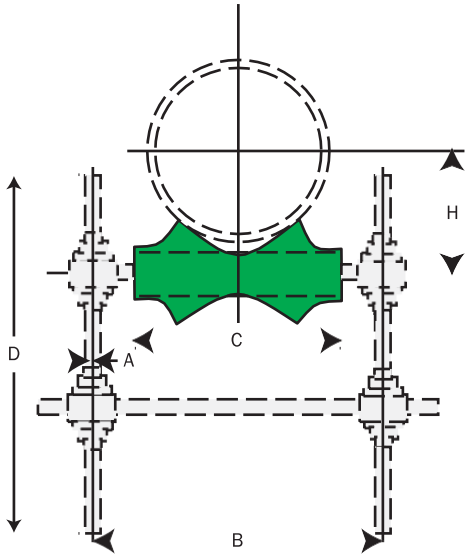
SPECIFICATIONS MAY VARY - All Dimensions in inches

Pipe Size	Rod Size	Adj. Socket No.	Max. Load lbs.	Wt. lbs/ea.	A	B*	C	D	E	F	H	J
2	3/8	#1-3/8	600	.57	5 1/4	4 1/8	2 5/8	1 3/16	3/4	3/8	1 5/8	9/16
3	1/2	#2-1/2	700	1.1	6 7/8	5 1/2	3 3/4	1 7/16	7/8	1/2	2 1/4	11/16
4	5/8	#3-1/2	750	1.7	8 1/4	6 3/4	4 3/4	1 3/4	1	1/2	2 13/16	3/4
5	5/8	#3-5/8	750	2.6	9 11/16	8 1/16	5 13/16	2	1 1/8	5/8	3 7/16	7/8
6	3/4	#4-3/4	1070	4.5	11 7/16	9 9/16	6 7/8	2 5/16	1 1/4	3/4	4	1
8	7/8	#5-7/8	1350	7.2	14 1/16	11 15/16	8 7/8	2 13/16	1 1/2	7/8	5 1/8	1 1/8
10	7/8	7/8	1730	9.5	16 3/16	14 1/16	11	3 3/8	1 3/4	7/8	6 3/8	1 1/8
12	7/8	7/8	2400	15.9	17 15/16	15 13/16	12 1/2	3 7/8	2	1	7 7/16	1 1/4
14	1	1	3130	24.3	20 1/8	17 3/4	14 1/4	4 5/8	2 1/2	1 1/8	8 3/8	1 3/8
16	1	1	3970	31.9	22 1/8	19 3/4	16 1/4	5	2 5/8	1 1/4	9 7/16	1 1/2
18	1	1	4200	35.5	24 1/2	21 7/8	18 1/4	5 7/16	2 3/4	1 1/4	10 1/2	1 1/2
20	1 1/4	1 1/4	4550	47.0	27 1/4	24 1/4	20 1/4	6	3	1 1/4	11 5/8	1 5/8
24	1 1/2	1 1/2	6160	76.3	32 1/8	28 5/8	24 1/4	7 3/16	3 5/8	1 1/2	14	1 3/4
30	1 1/2	1 1/2	7290	129.9	39	35 1/2	30 1/4	8 15/16	4 1/2	1 3/4	17 7/16	2 7/16

*Axle lengths may affect B dimension. Contact supplier before pre drilling holes.

ADJUSTABLE ROLL SUPPORT



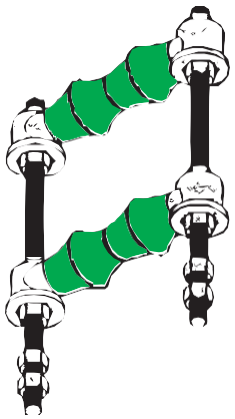


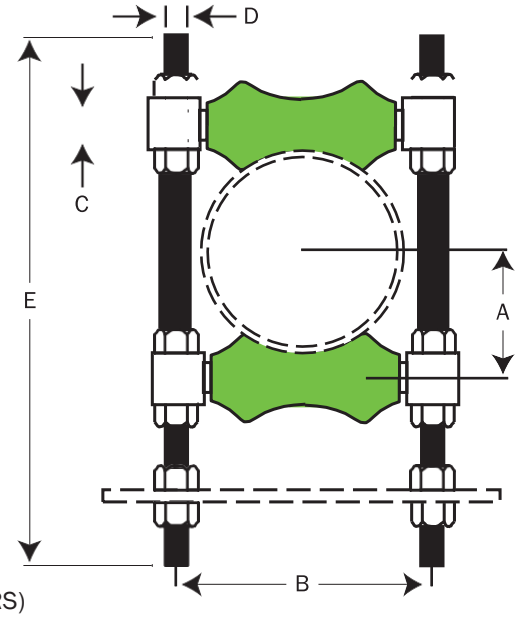
ADJUSTABLE ROLL SUPPORT INCLUDES:
2 ADJUSTABLE SOCKETS - 1 ROLL AXLE
2 VERTICAL THREADED RODS - 8 HEX NUTS
1 CAST IRON ROLL (OMIT WHEN ORDERING NON-CONDUCTIVE ROLLER)
SPECIFICATIONS MAY VARY - All Dimensions in inches

Pipe Size	Wt. lbs/ea.	Rod Size	*B	C	D	H
2	1.3	3/8	4 1/8	2 5/8	12	1 5/8
3	2.4	1/2	5 1/2	3 3/4	12	2 1/4
4	3.8	5/8	6 3/4	4 3/4	12	2 13/16
5	4.7	5/8	8 1/16	5 13/16	12	3 7/16
6	7.6	3/4	9 9/16	6 7/8	12	4
8	11.0	7/8	11 15/16	8 7/8	12	5 1/8
10	13.7	7/8	14 1/16	11	12	6 3/8
12	19.4	7/8	15 13/16	12 1/2	12	7 7/16
14	31.2	1	17 3/4	14 1/4	18	8 3/8
16	42.5	1	19 3/4	16 1/4	18	9 7/16
18	46.6	1	21 7/8	18 1/4	18	10 1/2
20	66.2	1 1/4	24 1/4	20 1/4	18	11 5/8
24	102.5	1 1/2	28 5/8	24 1/4	24	14
30	186.8	1 1/2	35 1/2	30 1/4	24	17 7/16

*Axle lengths may affect B dimension. Contact supplier before pre drilling holes.

ADJUSTABLE ROLL GUIDE



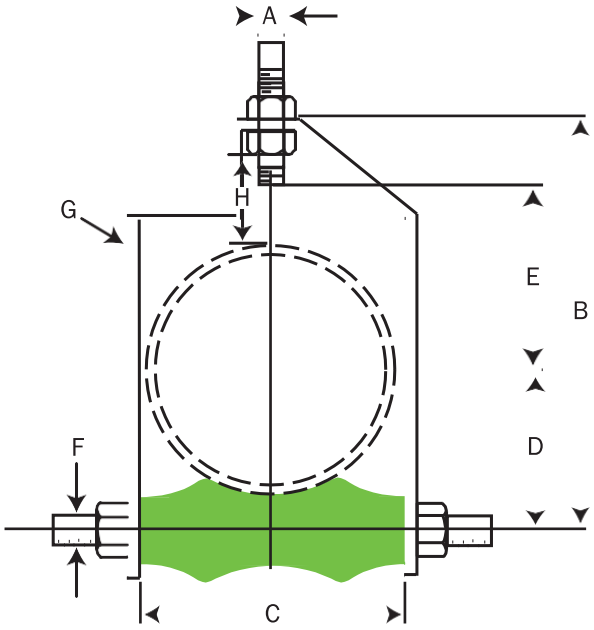


ADJUSTABLE ROLL GUIDE INCLUDES:
4 ADJUSTABLE SOCKETS
2 ROLL AXLES
2 VERTICAL THREADED RODS
12 HEX NUTS
2 CAST IRON ROLLS (OMIT WHEN ORDERING NON-CONDUCTIVE ROLLERS)
SPECIFICATIONS MAY VARY - All Dimensions in inches

Pipe Size	**A**	***B**	**C**	Rod Size **D**	**E**	Socket No.	Max. Load lbs.	Wt. lbs/ea.
2	1 9/16	4 1/8	3/8	3/8	12	#1-3/8	600	2.15
3	2 3/16	5 1/2	1/2	1/2	14	#2-1/2	700	4.34
4	2 3/4	6 3/4	1/2	5/8	18	#3-1/2	750	6.73
5	3 7/16	8 1/16	5/8	5/8	18	#3-5/8	750	8.95
6	4	9 9/16	3/4	3/4	24	#4-3/4	1070	14.59
8	5 1/4	11 15/16	7/8	7/8	24	#5-7/8	1350	24.33
10	6 1/4	14 1/16	7/8	7/8	30	#5-7/8	1730	27.7
12	7 7/16	15 13/16	1	7/8	30	#5-1	2400	39.62
14	8 5/16	17 3/4	1 1/8	1	36	#6-1 1/8	3130	57.61
16	9 3/8	19 3/4	1 1/4	1	36	#6-1 1/4	3970	87.57
18	10 3/8	21 7/8	1 1/4	1	42	#7-1 1/4	4200	99.54
20	11 1/2	24 1/4	1 1/4	1 1/4	42	#8-1 1/4	4550	131.82
24	13 13/16	28 5/8	1 1/2	1 1/2	42	#9-1 1/2	6160	219.74

*Axle lengths may affect B dimension. Contact supplier before pre drilling holes.

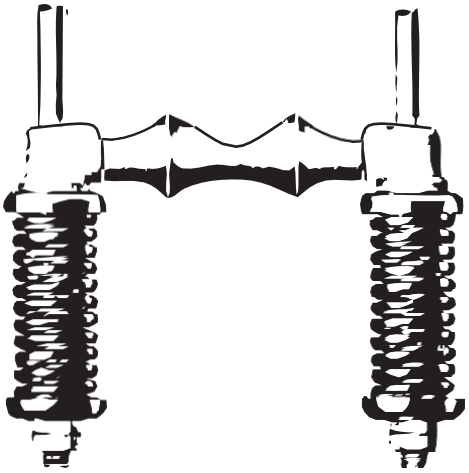
ADJUSTABLE ROLLER HANGER

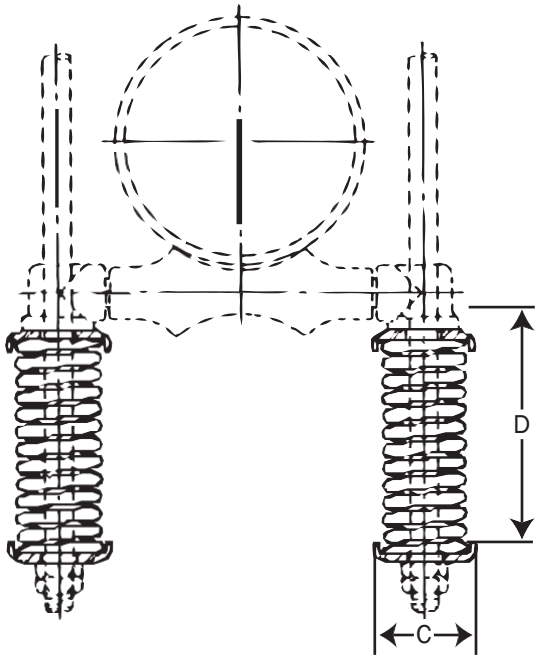


ADJUSTABLE ROLL HANGER INCLUDES:
1 STEEL CLEVIS (YOKE)
1 ROLL AXLE & NUTS
1 CAST IRON ROLL (OMIT WHEN ORDERING NON-CONDUCTIVE ROLLER)
SPECIFICATIONS MAY VARY - All Dimensions in inches

Pipe Size	Rod Size **A**	**B**	**C**	**D**	Rod Take Out **E**	Axle **F**	Steel Size **G**	Adjust. **H**	Max. Load lbs.	Wt. lbs/ea.
2	1/2	4 1/4	2 3/4	1 5/8	2 5/8	1/2	3/16 X 1 1/4	1 7/16	225	1.6
3	1/2	6 3/8	3 7/8	2 1/4	3 1/8	1/2	3/16 X 1 1/4	1 5/8	310	2.2
4	5/8	7 9/16	4 15/16	2 13/16	3 5/8	1/2	1/4 X 1 1/2	1 5/8	475	3.2
5	5/8	9 1/8	6	3 7/16	4 1/2	5/8	3/8 X 1 3/4	1 15/16	685	6.3
6	3/4	10 5/16	7 1/8	4	5	3/4	3/8 X 2	1 7/8	780	9.3
8	7/8	12 11/16	9 1/4	5 1/8	6 1/8	7/8	3/8 X 2 1/2	2	780	14.5
10	7/8	15 1/16	11 1/4	6 3/8	7 1/4	7/8	3/8 X 2 1/2	2 1/16	965	18.8
12	7/8	17 7/16	13 1/4	7 7/16	8 3/8	1	1/2 X 2 1/2	2 1/4	1200	27.7
14	1	18 7/8	14 1/2	8 3/8	8 3/4	1 1/8	1/2 X 2 1/2	2	1200	39.1
16	1	20 13/16	16 1/2	9 3/8	9 11/16	1 1/4	1/2 X 2 1/2	1 15/16	1200	49.1
18	1	23 3/4	18 1/2	10 7/16	11 7/16	1 1/4	1/2 X 3	2 13/16	1400	57.8
20	1 1/4	26	20 1/2	11 5/8	12 1/4	1 1/4	5/8 X 3	2 1/2	1600	75.9

SPRING CUSHION HANGER





MAXIMUM RECOMMENDED LOAD: 3000 lbs.

MATERIAL: Spring cushion hanger consists of a set of two springs and four retainers only.

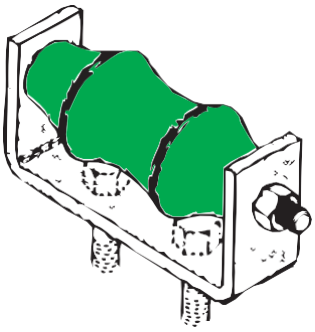
SERVICE: Generally used with single pipe roll. Recommended for installation where the vertical movement does not exceed 1 1/4 inches.

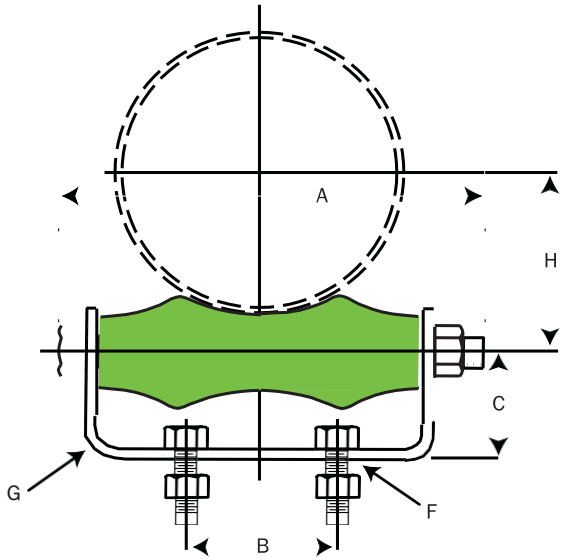
APPROVALS: Complies with Federal Specification WW-H-171E (Type 50) & Manufacturers Standardization Society SP-69 (Type 49).

All Dimensions in inches

Spring Number	Max. Recom. Deflection	Load, lb at Max. Recom. Deflection	Deflection Rate of Hanger lb/inch	Weight (approx.) lb. ea.	**C**	**D**	Size of Retainer Core	For Road Size	Max. Rod Size
1	1 1/4	535	428	4.5	2 21/32	6 7/16	7/16	3/8	3/4
2	1 1/4	1500	1200	14.0	4 1/8	6 1/16	9/16	1/2	3/4
3	1 1/4	3000	2400	22.0	4 1/8	9 1/16	15/16	7/8	1 1/2

ROLLER CHAIR





ROLLER CHAIR INCLUDES:

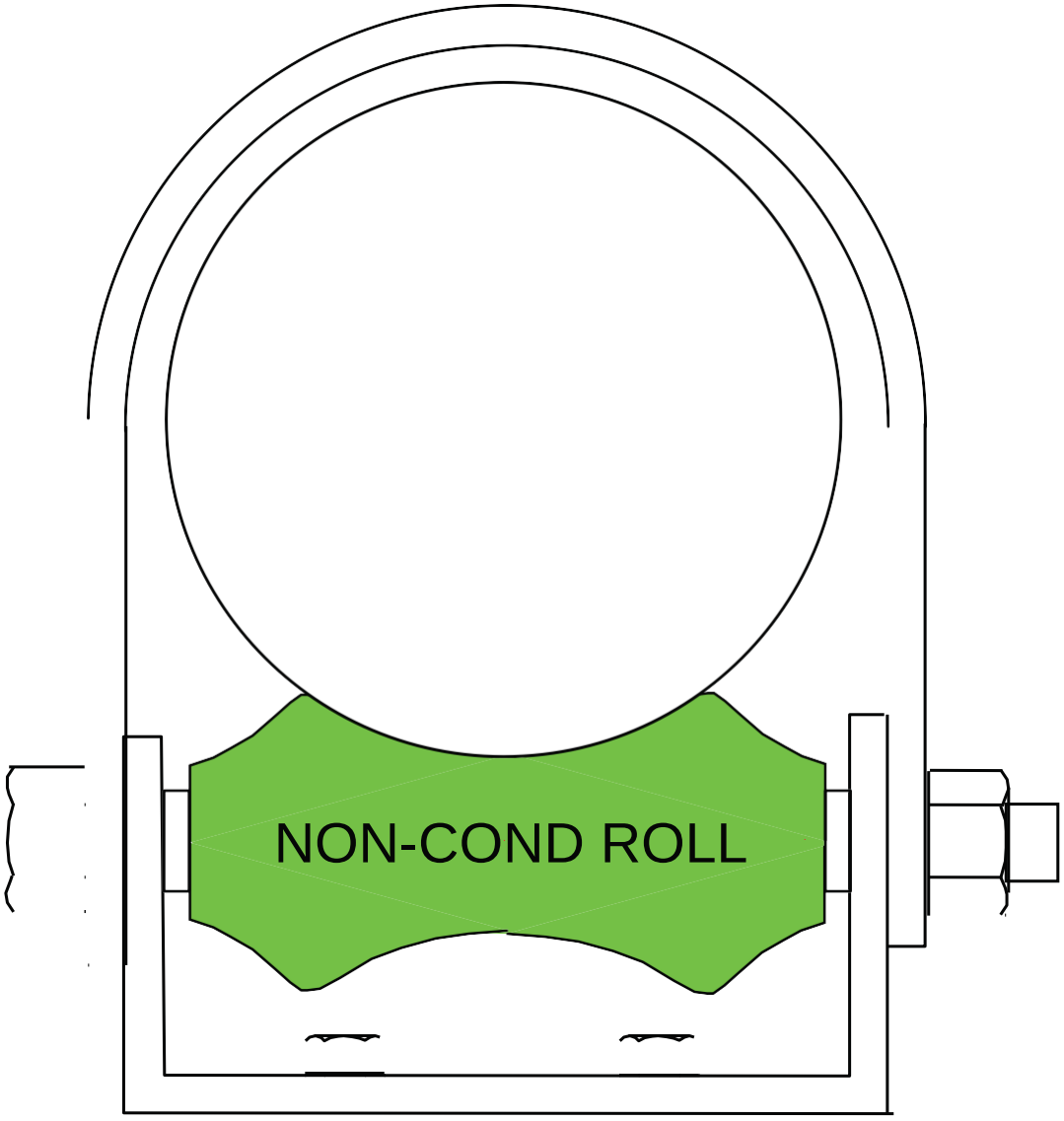
1 STEEL BASE
1 ROLL AXLE & NUTS
2 BOLTS & NUTS
1 CAST IRON ROLL (OMIT WHEN ORDERING NON-CONDUCTIVE ROLLER)

SPECIFICATIONS MAY VARY - All Dimensions in inches

Pipe Size	Wt. lbs/ea.	**A**	***B**	**C**	Bolt Size **F**	Steel Size **G**	**H**	Max. Load lbs.	Axle Size
2	1.1	4	1 1/4	1 1/2	3/8 X 1 1/2	1/4 X 1 1/4	1 5/8	300	3/8
3	1.6	5 3/8	2	1 3/4	3/8 X 1 1/2	1/4 X 1 1/4	2 1/4	600	1/2
4	2.9	6 5/8	2	2 5/16	1/2 X 1 1/2	3/8 X 1 1/2	2 13/16	700	1/2
5	3.9	7 7/8	3	2 1/2	1/2 X 1 1/2	3/8 X 1 1/2	3 7/16	700	5/8
6	6.0	9 1/4	3 1/8	2 3/4	1/2 X 1 1/2	3/8 X 2	4	1000	3/4
8	9.0	11 5/8	4	3	5/8 X 1 1/2	3/8 X 2	5 1/8	1300	7/8
10	13.8	14 1/8	5 1/4	3 5/8	5/8 X 2	1/2 X 2	6 3/8	1700	7/8
12	18.9	16 1/8	5 1/2	4 1/8	5/8 X 2	1/2 X 2	7 7/16	2300	1
14	28.07	18 3/4	6 1/2	4 11/16	3/4 X 2	1/2 X 2 1/2	8 3/8	3100	1 1/8
16	34.93	21	8 1/4	5 3/8	3/4 X 2 1/2	1/2 X 3	9 3/8	3900	1 1/4
18	44.35	23 1/8	9 1/4	6	3/4 X 2 1/2	1/2 X 3	10 7/16	4200	1 1/4
20	56.34	24 5/8	10 1/4	6 1/2	3/4 X 2 1/2	1/2 X 3	11 5/8	4500	1 1/4
24	87.52	29 3/8	12 1/4	7 7/8	7/8 X 3 1/2	5/8 X 4	14	6000	1 1/2

*Axle lengths may affect B dimension. Contact supplier before pre drilling holes.

ROLLER CHAIR WITH HOLD DOWN STRAP

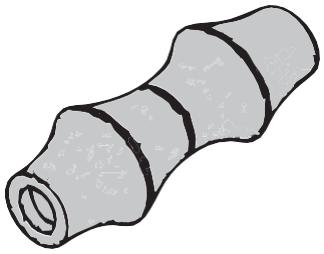


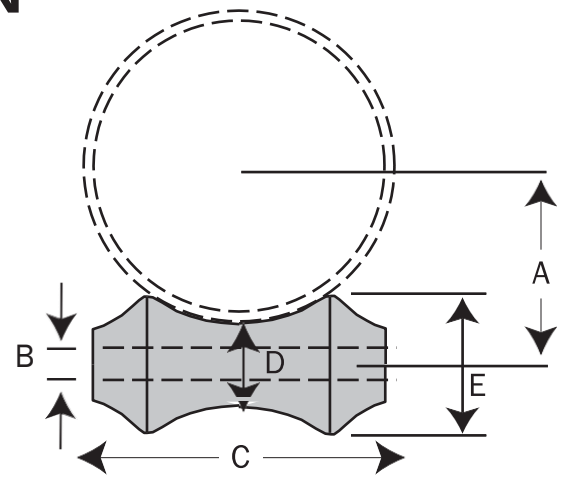
SPECIAL ROLLER CHAIR W/HOLD DOWN STRAP

INCLUDES: 1 - STEEL BASE
1 - SPECIAL AXLE W/NUTS
1 - HOLD DOWN STRAP

STRAPS ARE AVAILABLE WITH OR WITHOUT A POLYOLIFIN (SHRINK SLEEVE) COATING.

PIPE ROLLER
CAST IRON

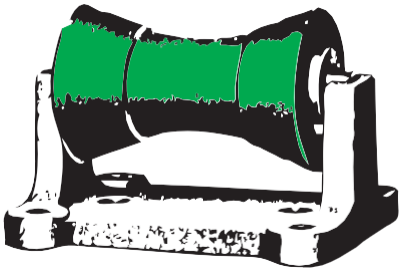


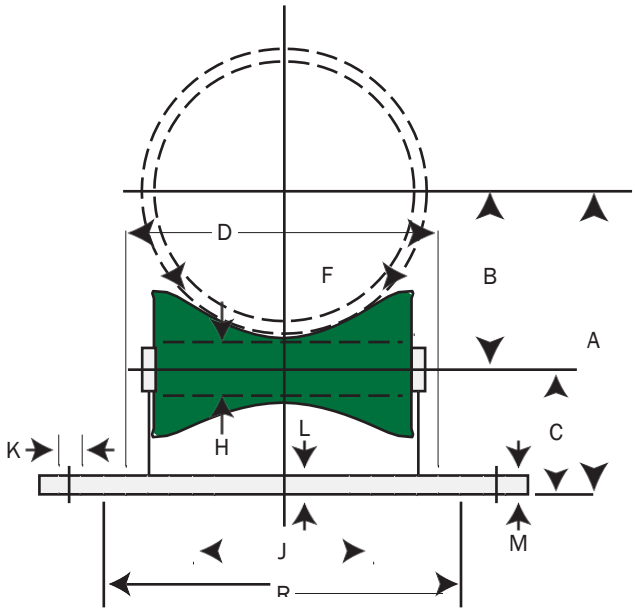


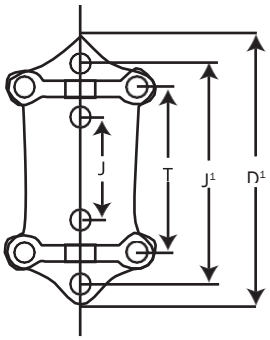
All Dimensions in inches

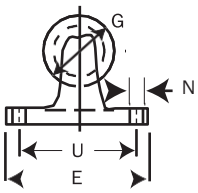
Pipe Size	**A**	Axle **B**	**C**	**D**	**E**	Max. Load lbs.	Wt. lbs/ea.
2	1 9/16	3/8	2 5/8	13/16	1 5/16	600	.32
3	3/16	1/2	3 11/16	7/8	1 7/16	700	.51
4	2 3/4	1/2	4 3/4	1	1 3/4	750	.66
5	3 7/16	5/8	5 7/8	1 1/4	2	750	1.21
6	4	3/4	6 15/16	1 5/16	2 1/4	1070	1.36
8	5 1/4	7/8	8 7/8	1 13/16	2 7/8	1350	3.75
10	6 1/4	7/8	11	1 3/4	3 1/4	1730	4.25
12	6 7/16	1	13	2	4	2400	9.00
14	8 5/16	1 1/8	14 3/8	2 5/8	4 3/4	3130	12
16	9 3/8	1 1/4	16 5/8	2 13/16	5 1/4	3970	25
18	10 3/8	1 1/4	18 3/8	2 13/16	5 9/16	4200	25
20	11 1/2	1 1/4	20 1/4	3 1/16	6	4550	32
24	13 13/16	1 1/2	24 1/4	3 5/8	7 3/16	6160	58
30	17 1/4	1 7/8	30 1/4	4 1/2	8 15/16	7290	112

PIPE ROLLER STAND









PIPE ROLLER STAND INCLUDES:

CAST IRON OR STEEL BASE 1

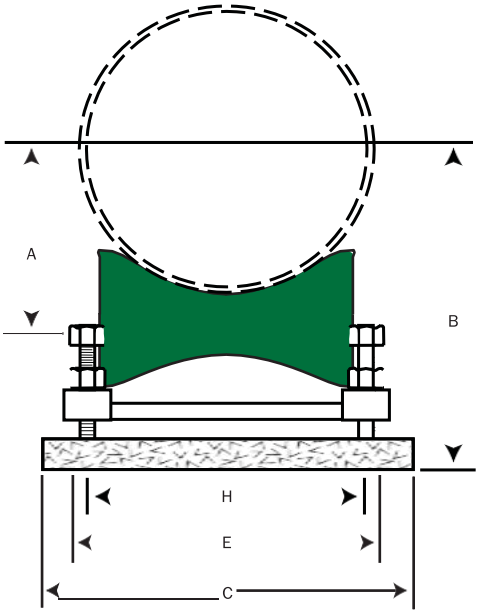
ROLL AXLE

1 CAST IRON ROLL (OMIT WHEN ORDERING NON-CONDUCTIVE ROLLER)

All Dimensions in inches

Pipe Size	A	B	C	D	D1	E	F	G	H	J	J1	K	L	M	N	R	T	U
2	3 1/2	1 3/4	1 3/4	4	8 3/8	5 3/8	2 3/4	1 7/8	1/2		6 3/8	1	9/16	1 1/16	1/2		3 7/16	4
2 1/2	3 7/8	2 1/8	1 3/4	4	8 3/8	5 3/8	2 3/4	1 7/8	1/2		6 3/8	1	9/16	1 1/16	1/2		3 7/16	4
3	4 1/8	2 3/8	1 3/4	4	8 3/8	5 3/8	2 3/4	1 7/8	1/2		6 3/8	1	9/16	1 1/16	1/2		3 7/16	4
3 1/2	4 3/8	2 5/8	1 3/4	4	8 3/8	5 3/8	2 3/4	1 7/8	1/2		6 3/8	1	9/16	1 1/16	1/2		3 7/16	4
4	4 13/16	2 3/4	2 1/16	5 3/8	9 7/8	5 3/8	3 3/4	2 1/16	1/2		7 7/8	1	3/4	7/8	1/2		4 11/16	4 1/4
5	5 7/16	3 3/8	2 1/16	5 3/8	9 7/8	5 3/8	3 3/4	2 1/16	1/2		7 7/8	1	3/4	7/8	1/2		4 11/16	4 1/4
6	6 1/16	4	2 1/16	5 3/8	9 7/8	5 3/8	3 3/4	2 1/16	1/2		7 7/8	1	3/4	7/8	1/2		4 11/16	4 1/4
8	8 11/16	5 1/4	3 7/16	7 3/4		6 5/8	6	3 1/4	3/4	4		1	3/4	7/8	5/8	8 5/8	7	5
10	9 13/16	6 3/8	3 7/16	7 3/4		6 5/8	6	3 1/4	3/4	4		1	7/8	7/8	5/8	8 5/8	7	5
12	11 3/8	7 1/2	3 7/8	9 7/8		7 7/8	8	4	7/8	5 3/4		1	7/8	7/8	3/4	10 15/16	9 1/16	6
14	12	8 1/8	3 7/8	9 7/8		7 7/8	8	4	7/8	5 3/4		1	7/8	7/8	3/4	10 15/16	9 1/16	6
16	13 5/8	9 3/8	4 1/2	11 1/4		8 5/8	9	4 1/2	1 1/8	6 3/4		1	7/8	1	13/16	12 3/8	10 1/4	6 1/2
18	14 5/8	10 3/8	4 1/2	11 1/4		8 5/8	9	4 1/2	1 1/8	6 3/4		1	7/8	1	13/16	12 3/8	10 1/4	6 1/2
20	15 5/8	11 3/8	4 1/2	11 1/4		8 5/8	9	4 1/2	1 1/8	6 3/4		1	7/8	1	13/16	12 3/8	10 1/4	6 1/2
24	17 3/4	13 3/8	4 3/8	12 1/2		8 5/8	10	4 7/16	1 1/4	7 1/2		1	1	1 1/8	13/16	13 1/2	11 3/8	6 1/2
30	21 7/8	16 3/4	5 1/8	15 3/4		10 3/4	12 1/2	5 1/2	1 3/4	10		1	1	1 1/2	1 1/16	17	14 1/4	8
36	25 1/4	20	5 3/4	18 3/4		12	15	6 3/8	2	12		1	1	1 3/4	1 5/16	20	17	9
42	28 7/8	23 1/8	5 3/4	18		12	15	6 3/8	2	12		1	1	1 3/4	1 5/16	20	17	9

ADJUSTABLE PIPE ROLLER STAND



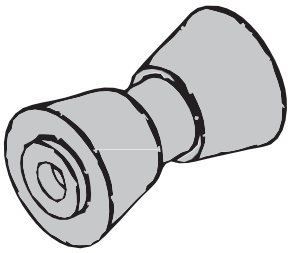
ADJUSTABLE PIPE ROLLER STAND INCLUDES:

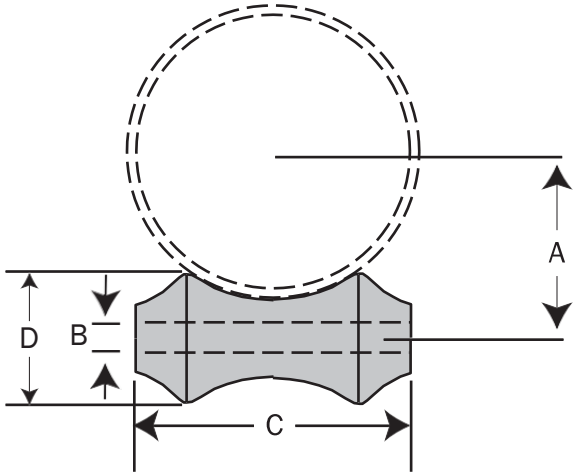
1 CAST IRON OR STEEL BASE
1 CAST IRON OR STEEL BASE PLATE
4 ADJUSTABLE BOLTS & LOCKING NUTS
1 ROLL AXLE
1 CAST IRON ROLL (OMIT WHEN ORDERING NON-CONDUCTIVE ROLLER)

All Dimensions in inches

Pipe Size	A	B		C	D	E	F	G	H	I	Max. Load lbs.	Weight lbs. ea.	Axle
		Min	Max										
2	1 13/16	4 1/2	5 7/8	6 7/8	5 1/2	3 7/8	1	5/8	3 1/2	4	390	14.56	1/2
2 1/2	2 1/16	4 3/8	6	6 7/8	5 1/2	3 7/8	1	5/8	3 1/2	4	390	14.56	1/2
3	2 3/8	5	6 3/8	6 7/8	5 1/2	3 7/8	1	5/8	3 1/2	4	390	14.56	1/2
3 1/2	2 5/8	5 1/4	6 5/8	6 7/8	5 1/2	3 7/8	1	5/8	3 1/2	4	390	14.56	1/2
4	2 3/4	5 3/4	7 1/4	8 1/8	5 3/4	5 1/8	1	5/8	4 7/8	4 3/8	950	18.32	1/2
5	3 3/8	6 1/4	7 3/4	8 1/8	5 3/4	5 1/8	1	5/8	4 7/8	4 3/8	950	18.32	1/2
6	3 15/16	6 7/8	8 3/8	8 1/8	5 3/4	5 1/8	1	5/8	4 7/8	4 3/8	950	18.32	1/2
8	5 1/4	9 5/8	11 3/4	10 5/8	6 3/4	7 3/8	1 1/8	5/8	7 1/16	5 1/16	2100	32.38	3/4
10	6 3/8	10 3/4	12 7/8	10 5/8	6 3/4	7 3/8	1 1/8	3/4	7 1/16	5 1/16	2100	32.38	3/4
12	7 1/2	12 1/8	14 3/4	13 1/4	8 3/16	9 3/4	1 1/8	7/8	9 1/4	6 1/16	3075	50.63	7/8
14	8 1/2	13	15 5/8	13 1/4	8 3/16	9 3/4	1 1/8	7/8	9 1/4	6 1/16	3075	50.63	7/8
16	9 1/4	14 3/4	18 1/8	14 5/8	8 5/8	11 1/8	1 1/4	1	10 3/4	6 3/4	4980	76.75	1 1/8
18	10 3/8	16 1/8	19 1/2	14 5/8	8 5/8	11 1/8	1 1/4	1	10 3/4	6 3/4	4980	76.75	1 1/8
20	11 3/8	17	20 3/8	14 5/8	8 5/8	11 1/8	1 1/4	1	10 3/4	6 3/4	4980	76.75	1 1/8
24	13 3/8	19 1/8	22 1/2	15 3/4	8 3/4	12 1/4	1 3/8	1	11 5/8	7 5/8	6100	85.25	1 1/4
30	16 11/16	24	26 3/4	19 1/4	8 3/4	15 3/4	1 5/8	1 1/4	14 1/4	8 3/16	7500	165.5	1 3/4

STAND PIPE ROLLER

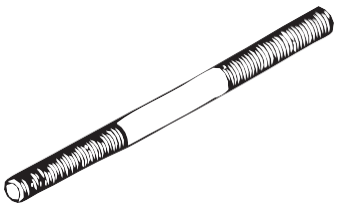


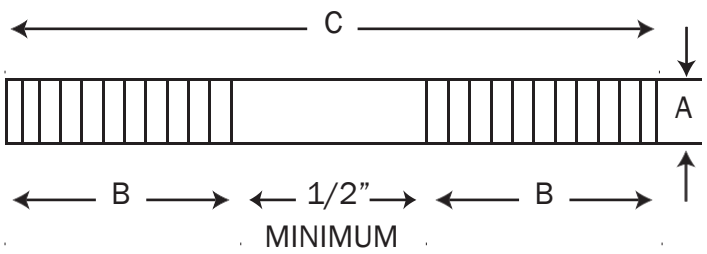


STAND PIPE ROLLER INCLUDES:
1 CAST IRON ROLL ONLY (STAND MODEL)
All Dimensions in inches

Pipe Size	A	B	C	D	Maximum Load/lbs.	Weight/Each No Rod
2	1 13/16	1/2	2 7/8	1 7/8	390	1
2 1/2	2 1/16	1/2	2 7/8	1 7/8	390	1
3	2 3/8	1/2	2 7/8	1 7/8	390	1
3 1/2	2 5/8	1/2	2 7/8	1 7/8	390	1
4	2 7/8	1/2	3 7/8	2 1/8	950	1.5
5	3 3/8	1/2	3 7/8	2 1/8	950	1.5
6	3 15/16	1/2	3 7/8	2 1/8	950	1.5
8	5 1/4	3/4	6 1/16	3 1/4	2100	4.85
10	6 3/8	3/4	6 1/16	3 1/4	2100	4.85
12	7 1/2	7/8	8 1/16	4	3075	8.9
14	8 1/8	7/8	9 1/8	4	3075	8.9
16	9 1/4	1 1/8	9 1/8	4 1/2	4980	13.2
18	10 3/8	1 1/8	9 1/8	4 1/2	4980	13.2
20	11 3/8	1 1/8	9 1/8	4 1/2	4980	13.2
24	13 3/8	1 1/4	10	4 11/16	6100	14
30	16 7/8	1 3/4	12 5/16	5 1/2	7500	24

HANGER ROD

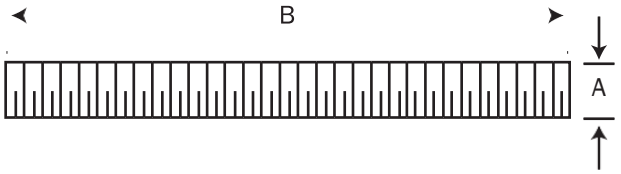




Rod Dia. A	Std. Thrd. Lgth. B	Maximum Recommended Load/lbs.		Weight Per C C = Length in Inches													
		650°F	750°F	8	10	12	14	18	24	30	36	42	48	54	60	66	72
3/8	6	610	540	*25	*32	*38	44	57	76	95	114	133	152	171	190	209	228
1/2	6	1130	1010	*45	*56	*67	78	100	134	167	201	235	268	302	335	369	402
5/8	6	1810	1610	*70	*86	*104	122	156	208	260	312	364	416	468	520	572	624
3/4	6	2710	2420	*100	*125	*150	174	225	300	375	450	525	600	675	750	825	900
7/8	6	3770	3360	*137	*169	*204	239	306	408	510	612	714	816	918	1020	1122	1224
1	6	4960	4420	*179	*214	*267	312	400	534	668	801	935	1068	1202	1335	1469	1602
1 1/8	8	6230	5560	*226	*280	*338	*395	507	676	845	1014	1183	1352	1521	1690	1859	2028
1 1/4	8	8000	7140	*279	*346	*417	*488	625	834	1043	1251	1460	1668	1877	2085	2294	2502
1 1/2	8	11630	10370	*402	*498	*600	*702	900	1200	1500	1800	2100	2400	2700	3000	3300	3600
1 3/4	10	15700	14000	*548	*675	*817	*947	*1225	1634	2042	2451	2860	3268	3676	4085	4493	4902
2	10	20700	18460	*717	*882	*1068	*1238	*1602	2136	2670	3204	3738	4272	4806	5340	5874	6408
2 1/4	12	27200	24260	*905	*1120	*1351	*1567	*2026	*2702	3377	4053	4728	5404	6080	6755	7430	8105
2 1/2	12	33500	29880	*1122	*1385	*1699	*1936	*2503	*3338	4172	5007	5841	6676	7510	8345	9180	10015

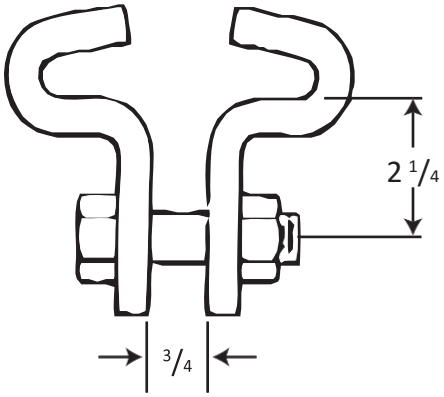
*CONTINUOUS THREADED ROD

CONTINUOUS THREADED ROD



Rod Size A	B = Feet	Max. Recom. Load/lbs.		Weight Per C Feet
		650° F	750° F	
1/4	6 and 12	240	215	12
3/8	6 and 12	610	540	30
1/2	6 and 12	1130	1010	54
5/8	6 and 12	1810	1610	85
3/4	6 and 12	2710	2420	124
7/8	6 and 12	3770	3360	171
1	6 and 12	4960	4420	223

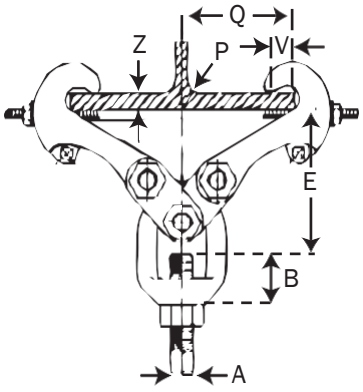
BEAM CLAMPS
HEAVY DUTY

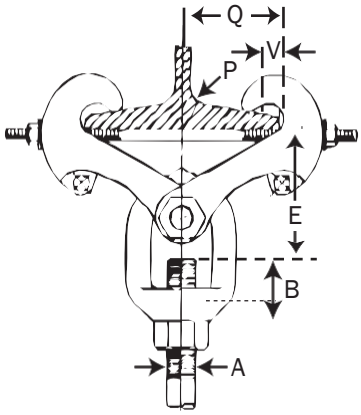


HEAVY DUTY BEAM CLAMPS INCLUDES:
TWO HALF CLAMPS
BOLT WITH NUT (ASSEMBLED)
All Dimensions in inches

Flange Width	Maximum Flange Thickness	Weight (approx.) lbs. ea.
4	1/2	3.82
5	5/8	4.35
6	3/4	4.52
7	7/8	4.84
8	7/8	5.10
9	1	5.83
10	1	6.25
11	1	6.67
12	1	7.09
Bolt Size	Stock Size	Max. Recom. Load/lbs.
5/8	1/2 x 2	3000

ADJUSTABLE BEAM CLAMP





Clamp Size Number	Maximum Rod Size A	Maximum Recommended Load/lbs.**	Weight (approximate) lbs. each	Maximum Beam Flange Thickness	**B**	**V**
1	3/4	2710	3.9	.60	1 1/4	1 1/8
2	1	4960	9.2	.60	1 11/16	1 1/8
3*	1	4960	13	.60	1 11/16	1 1/8
4	1	4960	21.7	1.031	1 1/2	1 1/8
5*	1	4960	33.9	1.031	1 1/2	1 1/8
6	1 1/2	11500	23.9	1.031	2 1/8	1 1/8
7*	1 1/2	11500	35.8	1.031	2 1/8	1 1/8
8	2	11500	36.8	1.031	4 9/16	1 1/8

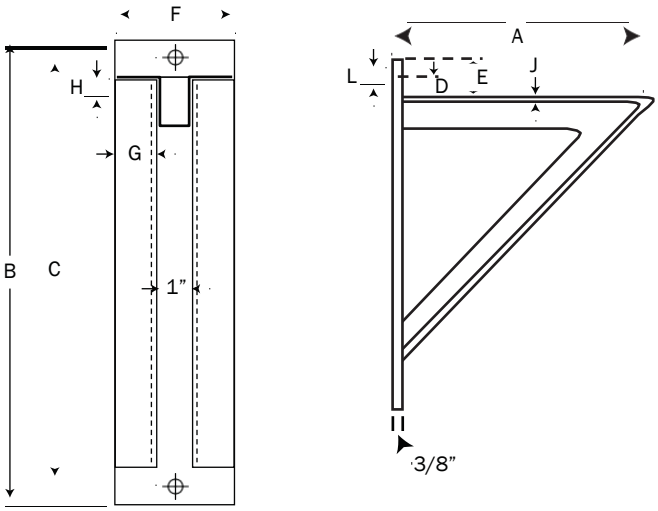
**Based on the allowable stresses shown in the ANSI Code for Pressure Piping

ROD TAKE-OUT (inches)

Clamp Size Number	Rod Take-Out, E For Width of Beam Flange												
	3	4	5	6	7	8	9	10	11	12	13	14	15
1	4 1/2	4 5/16	4 1/16	3 5/8	2 7/8								
2		4 3/4	4 7/16	4 1/8	3 3/8								
3*					5 15/16	6	5 5/16	5					
4		6 13/16	6 5/8	6 3/8	5 7/8	5 7/8	5 3/8	4 13/16					
5*									8 1/8	7 3/4	7 1/8	6 5/8	6 1/16
6		7 3/16	7	6 3/4	6 3/4	6 5/16	5 13/16	5 3/16					
7*									8 1/2	8 1/8	7 1/2	7	6 7/16
8		8 5/8	8 7/16	8 3/16	8 3/16	7 3/4	7 1/4	6 5/8					

*Furnished with Links

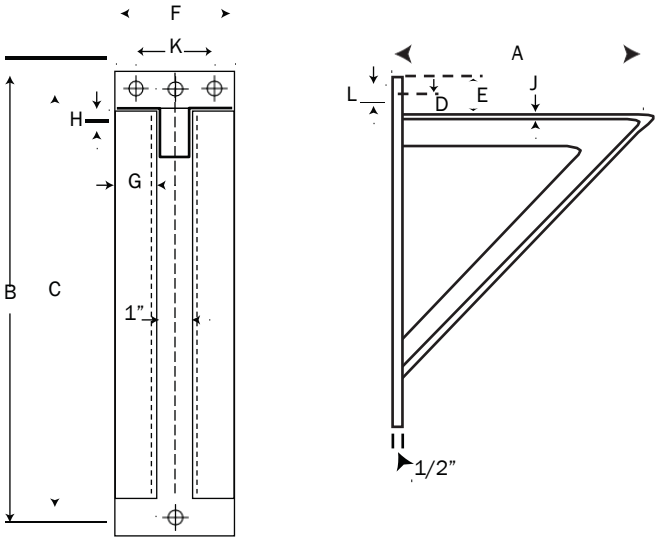
MEDIUM WELDED STEEL BRACKET



MAXIMUM RECOMMENDED LOAD 1,500 LBS.
All Dimensions in inches

Bracket Number	Weight (approx.) lbs. ea.	A	B	C	D	E	F	G	H	J	L
0	17.4	12	18	15 1/2	1 1/4	2 1/2	4	1 1/2	1 1/2	1/4	13/16
1	27.3	18	24	21 1/2	1 1/4	2 1/2	5	1 3/4	1 3/4	3/16	13/16
2	47.7	24	30	27 1/2	1 1/4	2 1/2	5	2	2	1/4	13/16

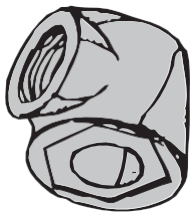
HEAVY WELDED STEEL BRACKET

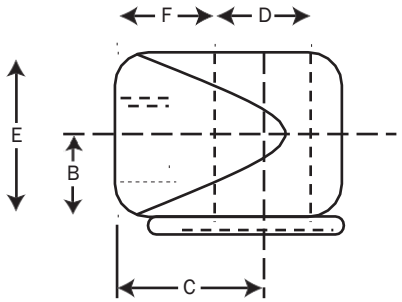


MAXIMUM RECOMMENDED LOAD 3,000 LBS.
All Dimensions in inches

Bracket Number	Weight (approx.) lbs. ea.	A	B	C	D	E	F	G	H	J	L	
0	24.3	12	18	15 1/4	1 3/8	2 3/4	4	1 1/2	2	1/4		13/16
1	51.8	18	24	21 3/8	1 7/16	2 3/4	5	2	2	3/8	2 3/4	15/16
2	65.8	24	30	27 1/2	1 1/2	2 3/4	5	2	2 1/2	5/16	2 1/2	1 1/16
3	82.1	30	36	33 1/4	1 5/8	3	5	2	2 1/2	5/16	2 1/2	1 1/16
4	140.5	36	42	39	1 1/2	3	6	2 1/2	3 1/2	3/8	3 1/2	1 1/16
5	166.4	42	50	46	1 1/2	1 1/2	6	2 1/2	3 1/2	3/8	3 1/2	1 1/16

ROLLER SOCKET





SIZE RANGE: 3/8" THRU 1 3/4" SHAFT THREAD
MATERIAL: CAST IRON (CAN BE MACHINED FROM STAINLESS STEEL) SERVICE:
TO BE USED WITH ROLLER PIPE HANGERS
ORDERING: SPECIFY MODEL NUMBER, SOCKET SIZE NUMBER, SHAFT THREAD, NAME.
Dimensions in inches

Shaft Size Number	Shaft Size & Threads / inch Number **A**	**B**	**C**	Rod Size **D**	**E**	**F**	Weight / lbs. Per 100 Sockets
1	3/8 - 16	5/8	11/16	3/8	1 1/16	1/2	13
2	1/2 - 13	3/4	13/16	1/2	1 3/8	1/2	24
3	1/2 - 13	3/4	15/16	5/8	1 1/2	5/8	35
3	5/8 - 11	7/8	15/16	5/8	1 1/2	5/8	49
4	3/4 - 10	1	1 1/4	3/4	1 3/4	7/8	77
5	7/8 - 9	1 1/8	1 1/2	7/8	2 1/4	1 1/16	122
5	1 - 8	1 1/4	1 1/2	7/8	2 1/4	1 1/16	152
6	1 1/8 - 7	1 3/8	1 1/2	1	2 1/2	1	213
6	1 1/4 - 7	1 1/12	1 1/2	1	2 1/2	1	244
7	1 1/4 - 7	1 1/2	1 1/2	1 1/8	2 3/4	1	282
8	1 1/4 - 7	1 5/8	1 7/8	1 1/4	3 1/4	1 1/4	390
9	1 1/2 - 6	1 3/4	2 1/8	1 1/2	3 3/8	1 3/8	530
9	1 3/4 - 5	1 3/4	2 1/8	1 1/2	3 3/8	1 3/8	775

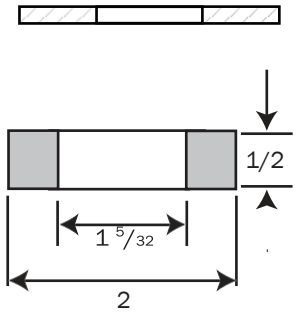
A = Diameter of Axle & Threads per Inch D = Diameter of Hanger Rod

CLEVIS INSULATOR

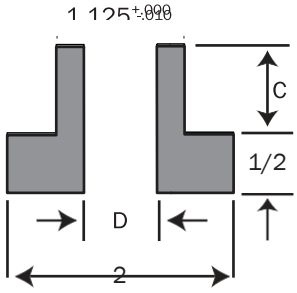
The CLEVIS INSULATOR ensures electrical isolation from the carrier pipe and its support. In the event the pipe were to contact the hanger the clevis insulator prevents any metal to metal contact between the main's clevis hanger and any supporting structures. The insulators are generally used in conjunction with Non-Conductive Rollers on clevis hangers because even minor alignment problems frequently result in pipe to hanger contact. Clevis insulator collars and bushings are fabricated from DuPont Delrin ™, washers are stainless steel.

Clevis Insulators can be used with any standard pipe hanger

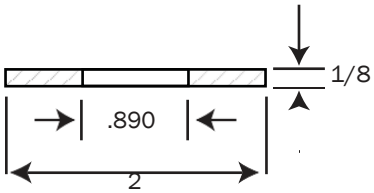
CLEVIS INSULATOR COMPONENTS



DELRIN COLLAR

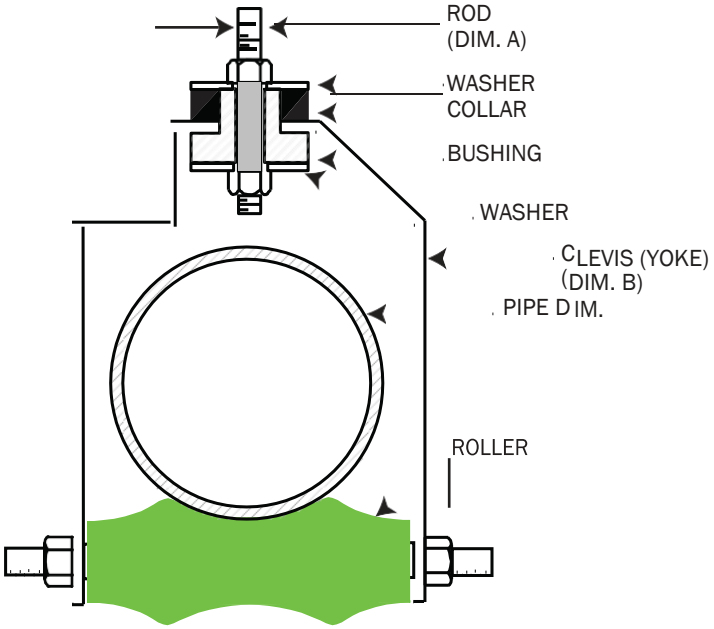


DELRIN BUSHING



ST. STL. WASHER TOP & BOTTOM

TYPICAL APPLICATION



DIMENSIONS

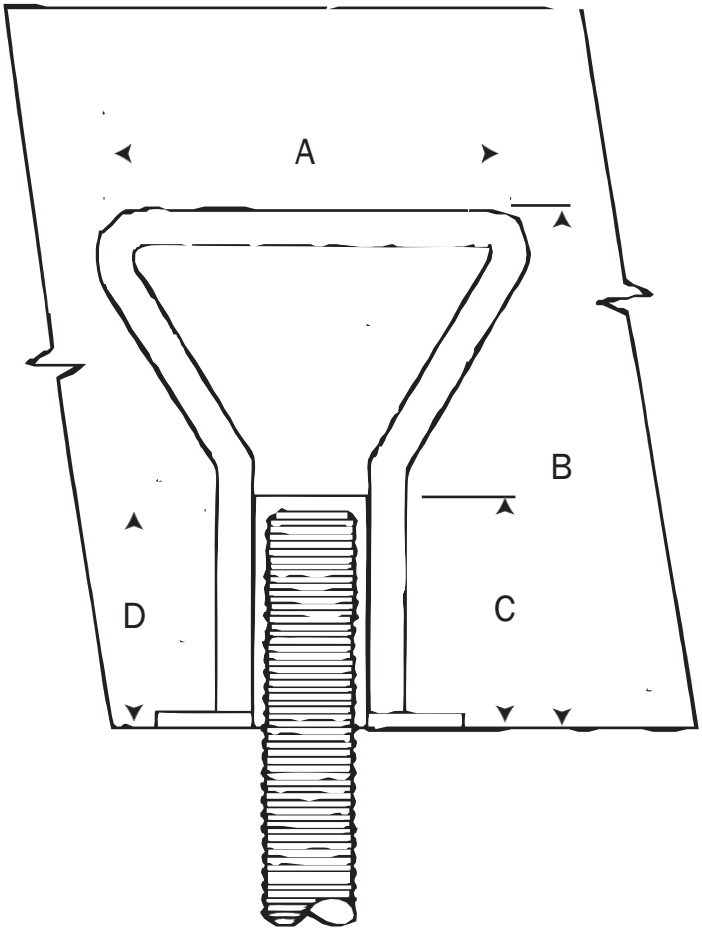
Dimensions in inches

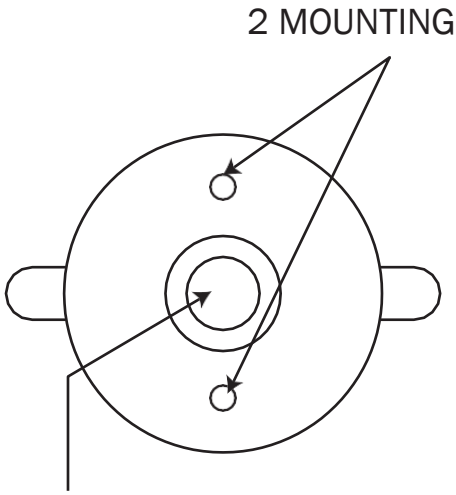
Pipe Diameter	Hanger Rod Diameter **A**	Clevis (Yoke) Stock Size **B**	Bushing Neck Height **C**	I.D. Bushing
2”	3/8	1/4 - 2 1/2	11/16	25/64
3”	1/2	1/4 - 2 1/2	11/16	33/64
4”	5/8	1/4 - 2 1/2	11/16	41/64
5”	5/8	3/8 - 2 1/2	27/32	41/64
6”	3/4	3/8 - 2 1/2	27/32	25/32
8”	7/8	3/8 - 2 1/2	27/32	57/64
10”	7/8	1/2 - 2 1/2	31/32	57/64
12”	7/8	1/2 - 3	31/32	57/64

PHYSICAL PROPERTY COMPARISON

PHYSICAL PROPERTIES	ASTM	UNITS	DELRIN 150 E
Izod Impact (Notched) -40°F +73°F	D256	ft-lb/in	1.2 1.5
Tensile - Impact Strength	D1822 (long)	ft-lb/in2	170
Flex Modulus (0.05 in/min) -68°F +73°F	D790	kpsi	640 425
Compressive Stress +73°F @ 10% def	D695	kpsi	18
Modulus of Elasticity	D638	kpsi	450
Flexural Strength, Yield +73°F	D790	kpsi	14.3
Poisson's Ratio	____	____	.35
Shear Strength +73°F	D732	kpsi	9.5
Tensile Strength (0.2in/min) -68°F +73°F	D638	kpsi	14.7 10
Tensile Elongation at Break -68°F +73°F	D638	%	38 60
Moisture Absorption Comparison	24 hr, 50% RH 24 hr Immersion	Delrin .25% Delrin .90%	Nylon 1.2% Nylon 8.0%

LOOP DESIGN LIGHT DUTY CONCRETE INSERT





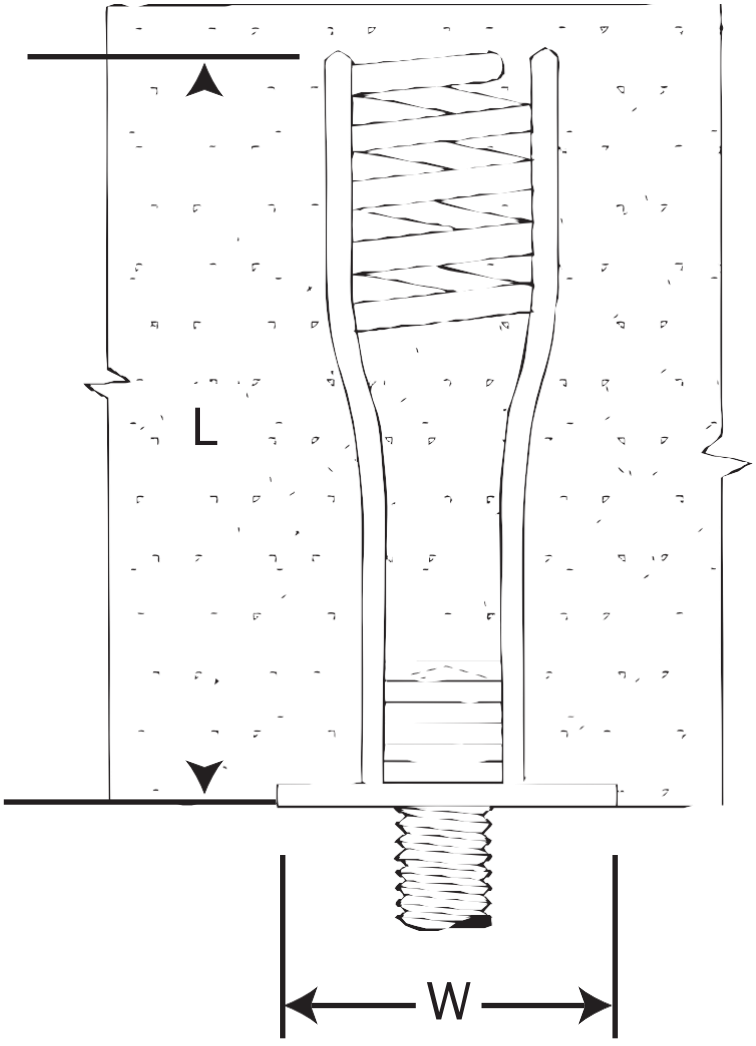
BOTTOM VIEW

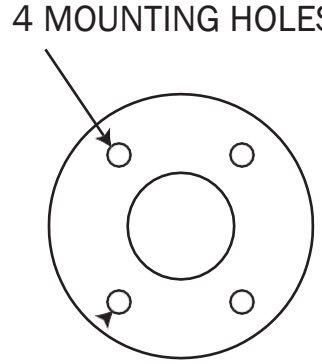
HANGER ROD NOT INCLUDED

ROD DIA. & T.P.I.	**A**	**B**	SAFE LOAD	**C**	**D**
1/2" x 13	2 3/8"	4 3/32"	2800 lbs.	1 7/8"	1 5/8"
5/8" x 11	3 3/8"	4 3/32"	3600 lbs.	1 7/8"	1 5/8"
3/4" x 10	3 3/8"	4 3/32"	3600 lbs.	1 7/8"	1 5/8"

COIL DESIGN HEAVY DUTY CONCRETE INSERT

SAFE WORKING LOADS REFLECT A 3:1 SAFETY (ULTIMATE WORKING LOAD)
FOR CONCRETE COMPRESSIVE STRENGTH OF 3000 psi (20.7 MPa)





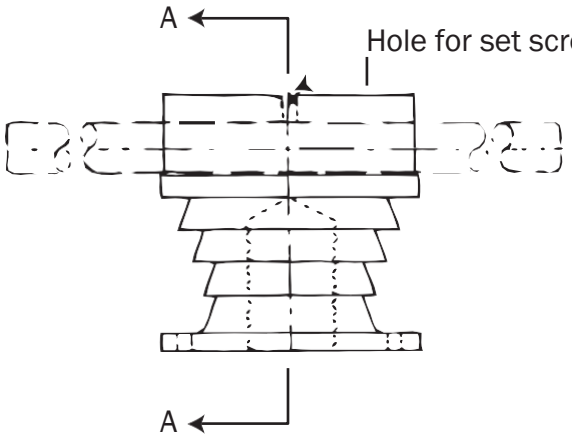
THREADED HOLE FOR HANGER ROD

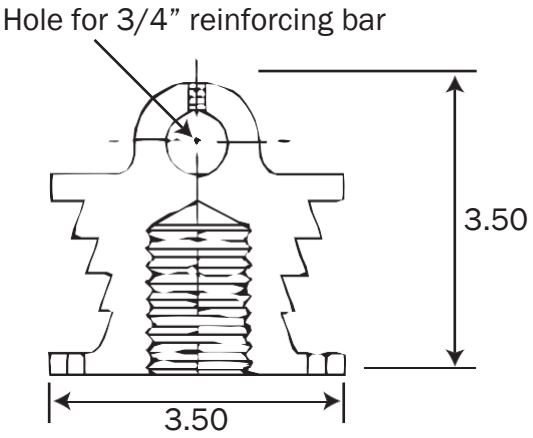
BOTTOM VIEW

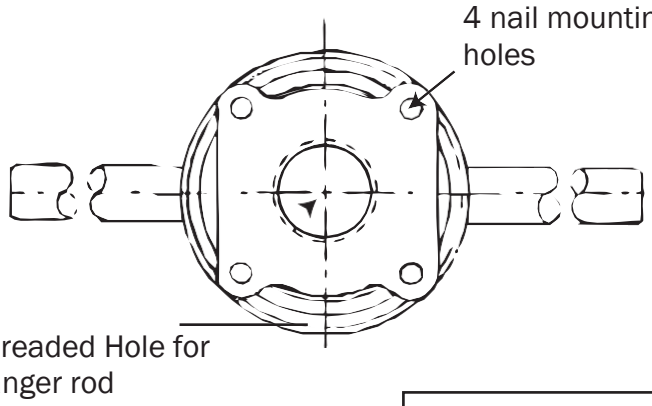
HANGER ROD NOT INCLUDED

ROD DIA.	WIDTH	LENGTH	SAFE LOAD Shear	WASHER THICKNESS	Minimum Concrete Thickness
7/8”	2 5/8”	5 1/2”	6000 lbs.	3/16”	6”
1”	2 5/8”	5 1/2”	8000 lbs.	3/16”	6”
1 1/4”	3 1/8”	7 1/2”	13,200 lbs.	7/32”	8”
1 1/2”	3 1/4”	9 1/2”	18,000 lbs.	7/32”	12”

SKYHOOK DESIGN™ CONCRETE INSERT







SECTION A-A

LB&A, INC. - A "UTILITY SERVICE" COMPANY
SKYHOOK DESIGN™ CONCRETE INSERT
Design by Linn Brown **Patent No. 362,177**

ADVANTAGES & IMPROVEMENTS:

SOLID one piece construction, compact design, Type 316 stainless steel throughout.

SINGLE 3/4" x 12" TYPE 316 STAINLESS STEEL REINFORCING BAR (included) has more surface area than two 1/2" bars. Bar is held in place by set screw.

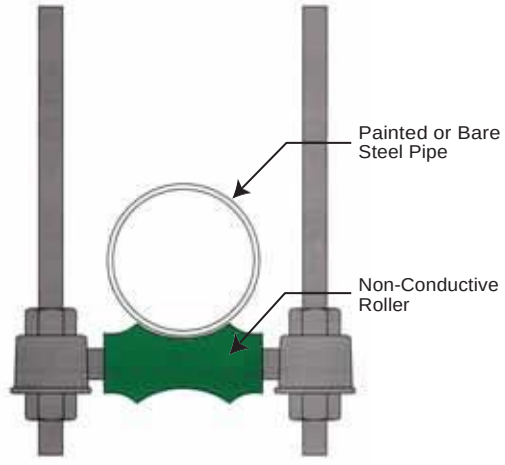
LONGER AND STRONGER THREAD ENGAGEMENT for hanger rods of 3/4" up to 1 1/2" diameter.

RINGS OF "BARRACUDA" TEETH around wedge shaped body for superior anchoring.

COMPLETE PROTECTION of tapped hanger rod hole for poured concrete.

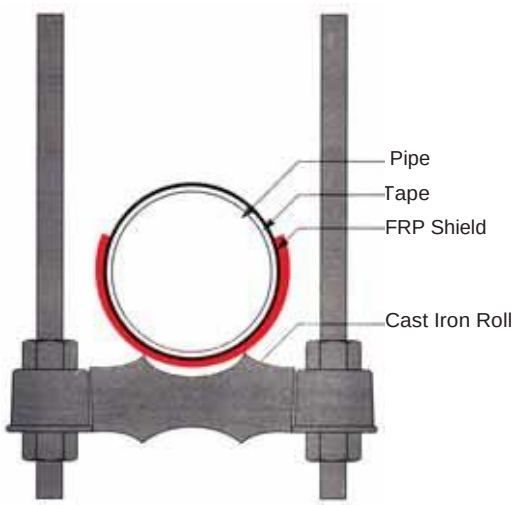
SINGLE PIPE ROLL (1B)

PAINTED OR BARE STEEL PIPE



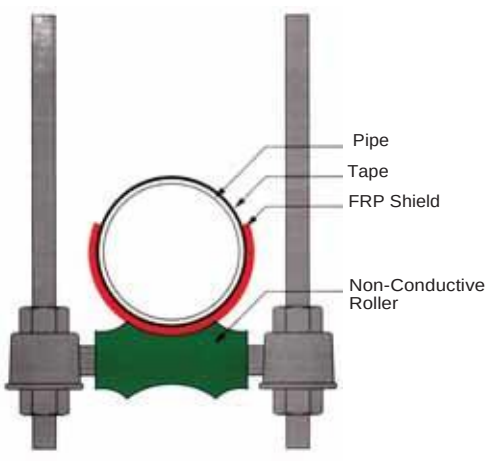
Recommendation: Non-Conductive Pipe Roller
Reasons: Eliminates the possibility of moisture entrapment.
Roller will not bind or abrade the paint.
Maintains electrical isolation.

TAPE COATED STEEL PIPE WITH CAST IRON ROLLER

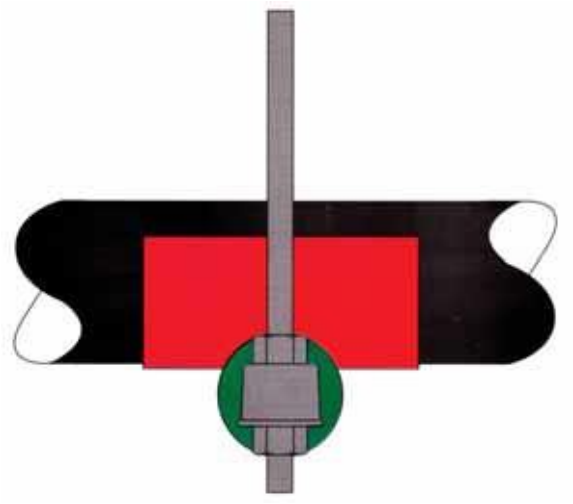


Recommendation: FRP Type # 240 Shield
Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLER



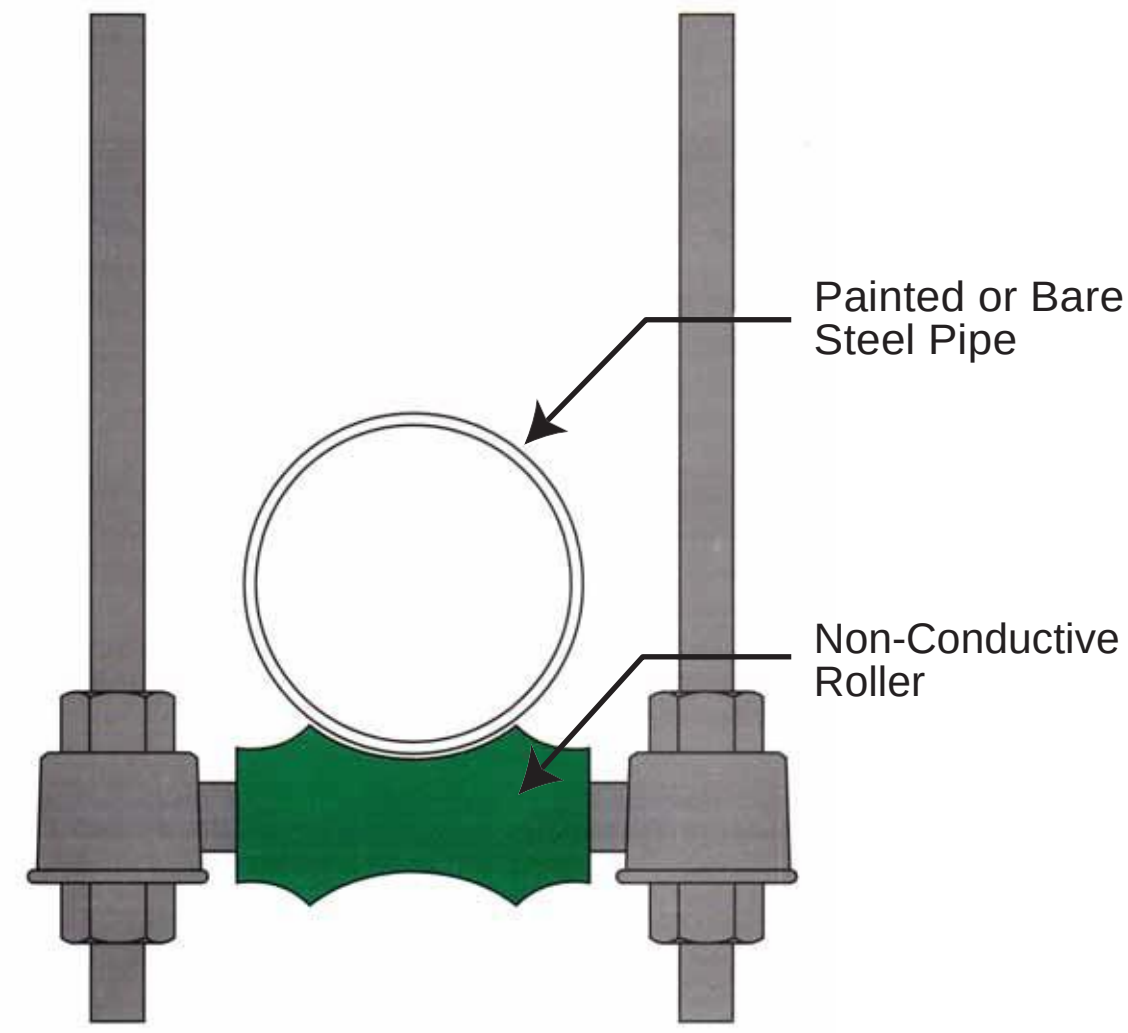
Recommendation: FRP Type # 240 Shield & Non- Conductive Roller
Reasons: Protects tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation
Non- Conductive Roller will not bind



Side View: Type # 240 Shield
Non- Conductive Roller

SINGLE PIPE ROLL (1B)

PAINTED OR BARE STEEL PIPE



Recommendation: Non-Conductive Pipe Roller

Reasons: Eliminates the possibility of moisture entrapment.
Roller will not bind or abrade the paint.
Maintains electrical isolation.

PIPELINE BRIDGE CROSSINGS

CONDITION: PAINTED OR BARE STEEL PIPE

Recommendation:

Non-Conductive Rollers should be used in lieu of, or as a direct replacement for, cast iron rolls on any bridge main installation that is, or going to be, painted. This applies for both existing and new mains. Most paints provide only a thin barrier and are extremely susceptible to abrasion damage. This is particularly true at each pipe to support contact.

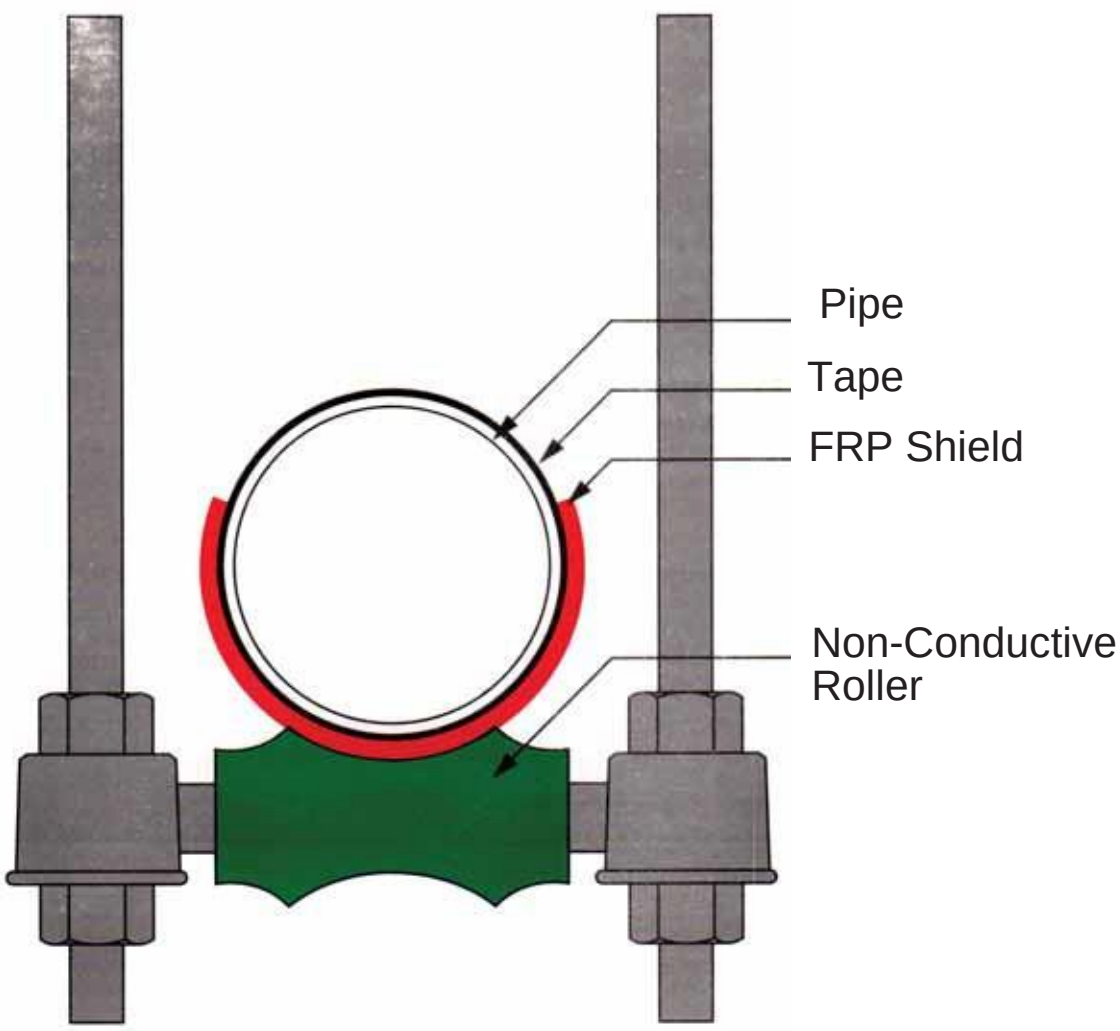
Reasons:

The polyurethane based Non-Conductive Rollers are best used alone with thin coatings because they are non-abrasive and maintain a minimum surface contact. This eliminates any possibility of moisture collecting between the pipe and support. In addition, the Non-Conductive Rollers are solid and do not have the same tendency to bind as the hollow cast iron rolls. Lubricating the roller's stainless steel sleeve prior to inserting the axle seals out moisture and reduces friction.

When a pipe has a thin barrier coating the use of a FRP Shield increases the possibility of moisture entrapment between the pipe and shield interface. In most cases this would aggravate any corrosive conditions located between the pipe and the FRP Shield.

SINGLE PIPE ROLL (1B)

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLER



Recommendation:	FRP Type # 240 Shield & Non-Conductive Roller
Reasons:	Protects tape from abrasion
	Prevents cold flow of the tape
	Ensures electrical isolation
	Non- Conductive Roller will not bind

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP COATING WITH NON-CONDUCTIVE ROLLER™

Recommendation:

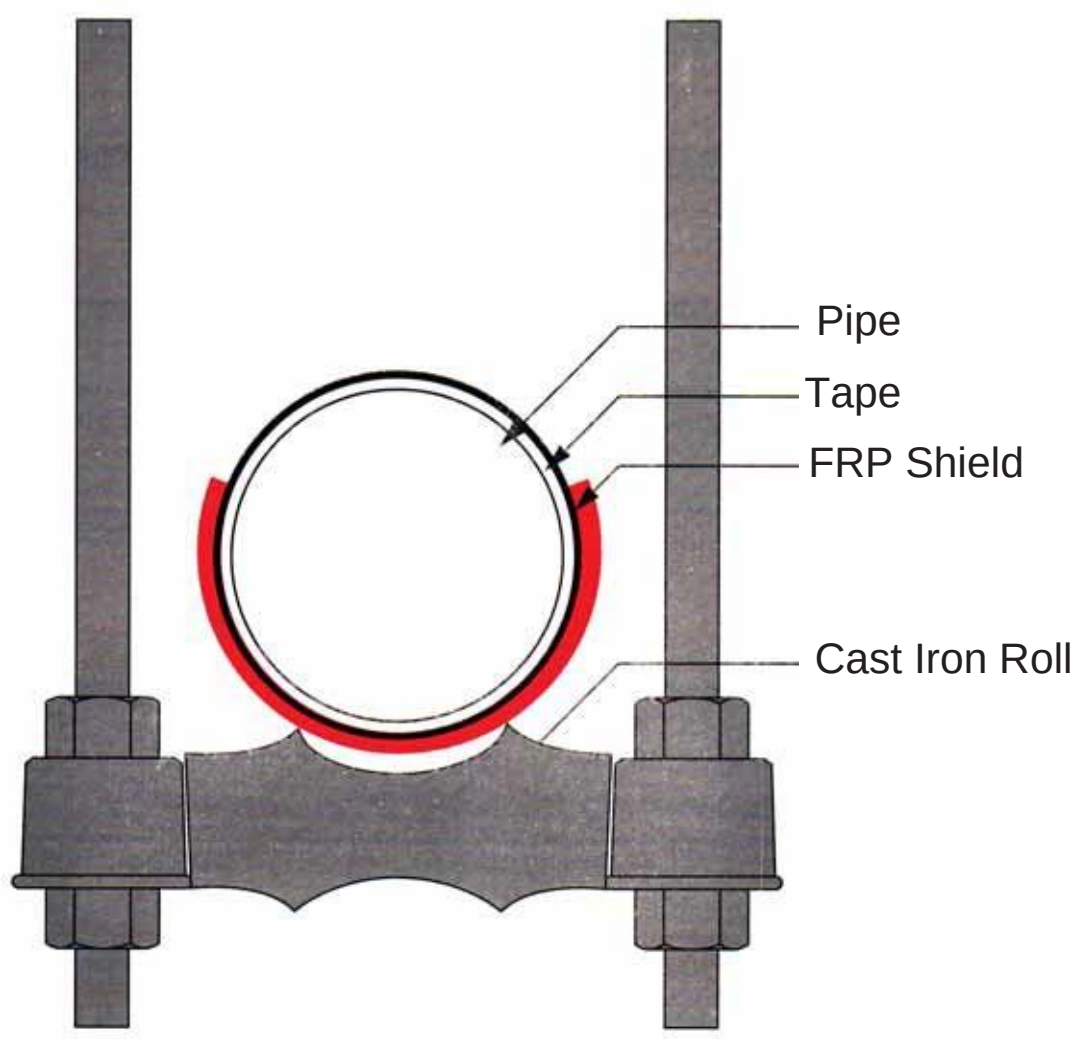
A Type # 240 Shield needs to be installed with any factory or field applied tape. This is the case even when Non-Conductive Roller are used. The profile of a urethane roller is designed to accommodate both the tape wrap and FRP Shield. Although the Non-Conductive Rollers greatly reduce the possibility of abrasion, the tape must still be protected from cold flow damage. FRP Shields prevent damage by providing the necessary weight distribution between the pipe and its support. This is particularly important if the pipe becomes misaligned.

Reasons:

When used together, the Non-Conduction Rollers and FRP Shields provide the best possible protection for any tape type wrap. Unlike hollow cast iron rolls, the Non-Conductive Rollers are solid and do not tend to bind and will not corrode internally. The urethane composition stays flexible even in cold temperatures. This provide a degree of vibration tolerate which is one of the primary causes for alignment problems. Lubrication the roller's stainless steel sleeves seals out moisture and reduces friction. FRP Shields maintain the tape's integrity against both normal and possible abnormal loading due to misalignments and/or support failure.

SINGLE PIPE ROLL (1B)

TAPE COATED STEEL PIPE WITH CAST IRON ROLLER



Recommendation: FRP Type # 240 Shield

Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP COATING WITH CAST IRON ROLL

Recommendation:

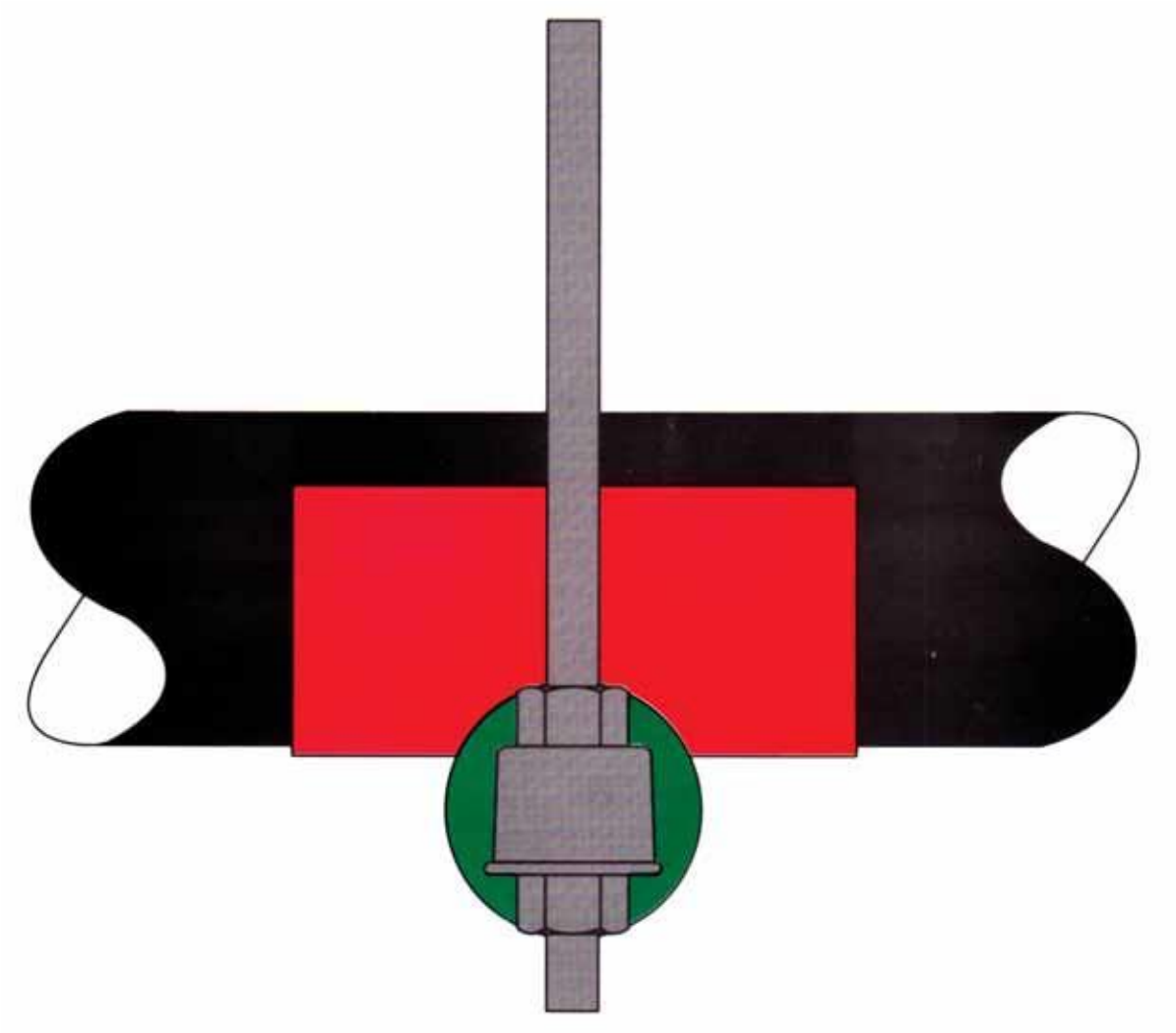
A Type # 240 Shield needs to be installed with any factory or field applied tape. This is particularly important when cast iron rolls are used. The profile of cast iron rolls do not accommodate thick barrier coatings. The tapes change the OD of the pipe to the point it will no longer rest in the cradle of the roll as is the case with bare or painted pipes. Instead, the pipe will rest on the peaks of the roll. This situation aggravates the point loading that normally occurs at each of the pipe's support.

Reasons:

Tape wraps are a thick barrier coating that must be protected at each support. Without protection the tape will cold flow as a result of being sandwiched between the pipe and its support. Abrasion due to even minor thermal expansion and contraction will further compromise the integrity of the tape. Fiberglass reinforcement enables the FRP Shields to tolerate the point loading and prevent abrasion damage by providing a desirable weight distribution. The FRP Shields also ensure a high degree of electrical isolation.

Unlike non-reinforced plastics, the Fiberglass Reinforced Shields do not get brittle in the cold and are resistant to UV degradation.

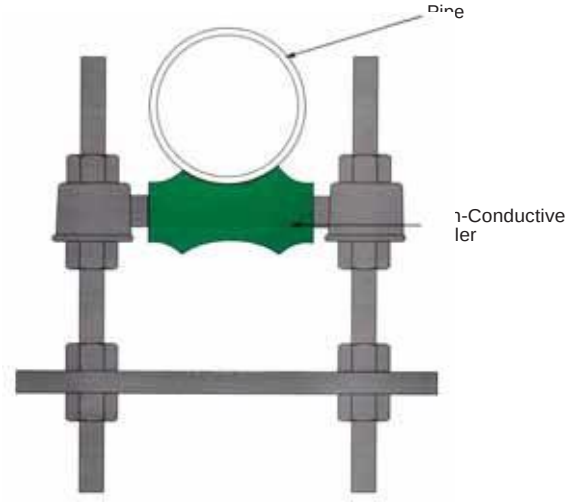
SINGLE PIPE ROLL (1B)



Side View: Type # 240 Shield
Non- Conductive Roller

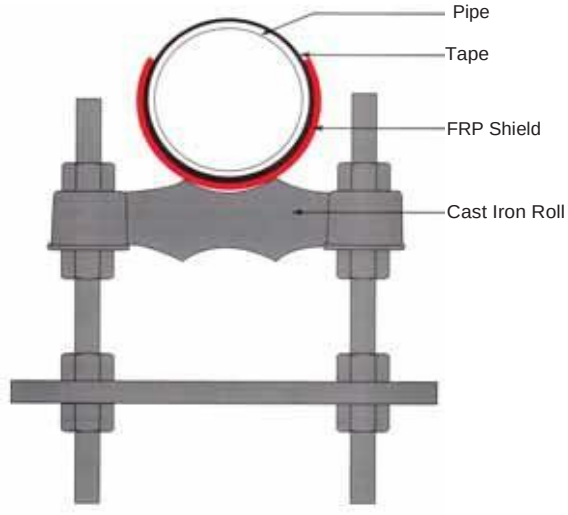
ADJUSTABLE ROLL SUPPORT (2B)

PAINTED OR BARE STEEL PIPE



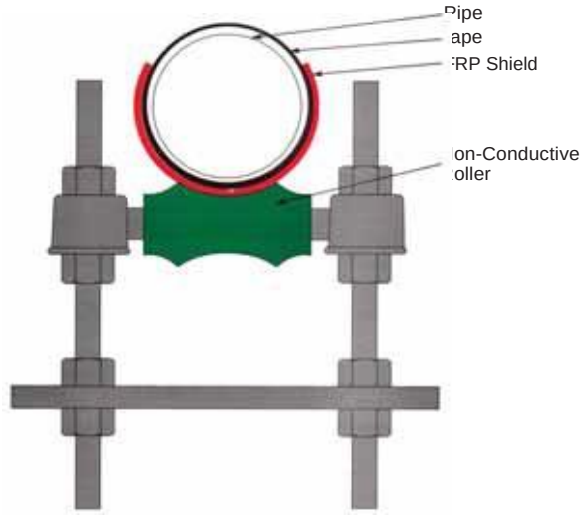
Recommendation: Non-Conductive Pipe Roller
Reasons: Eliminates the possibility of moisture entrapment
Roller will not bind or abrade the paint
Maintains electrical isolation

TAPE COATED STEEL PIPE WITH CAST IRON ROLLER

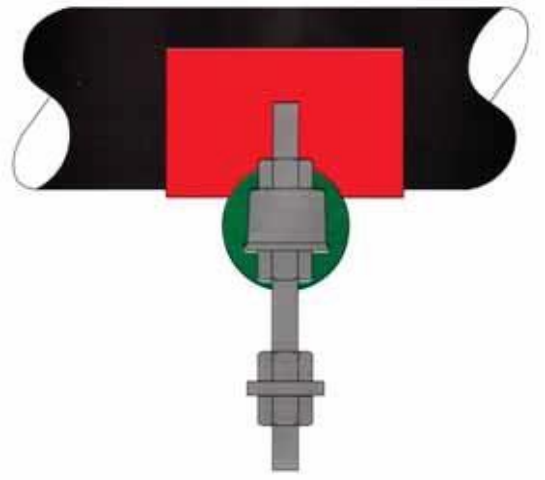


Recommendation: FRP Type # 240 Shield
Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLER



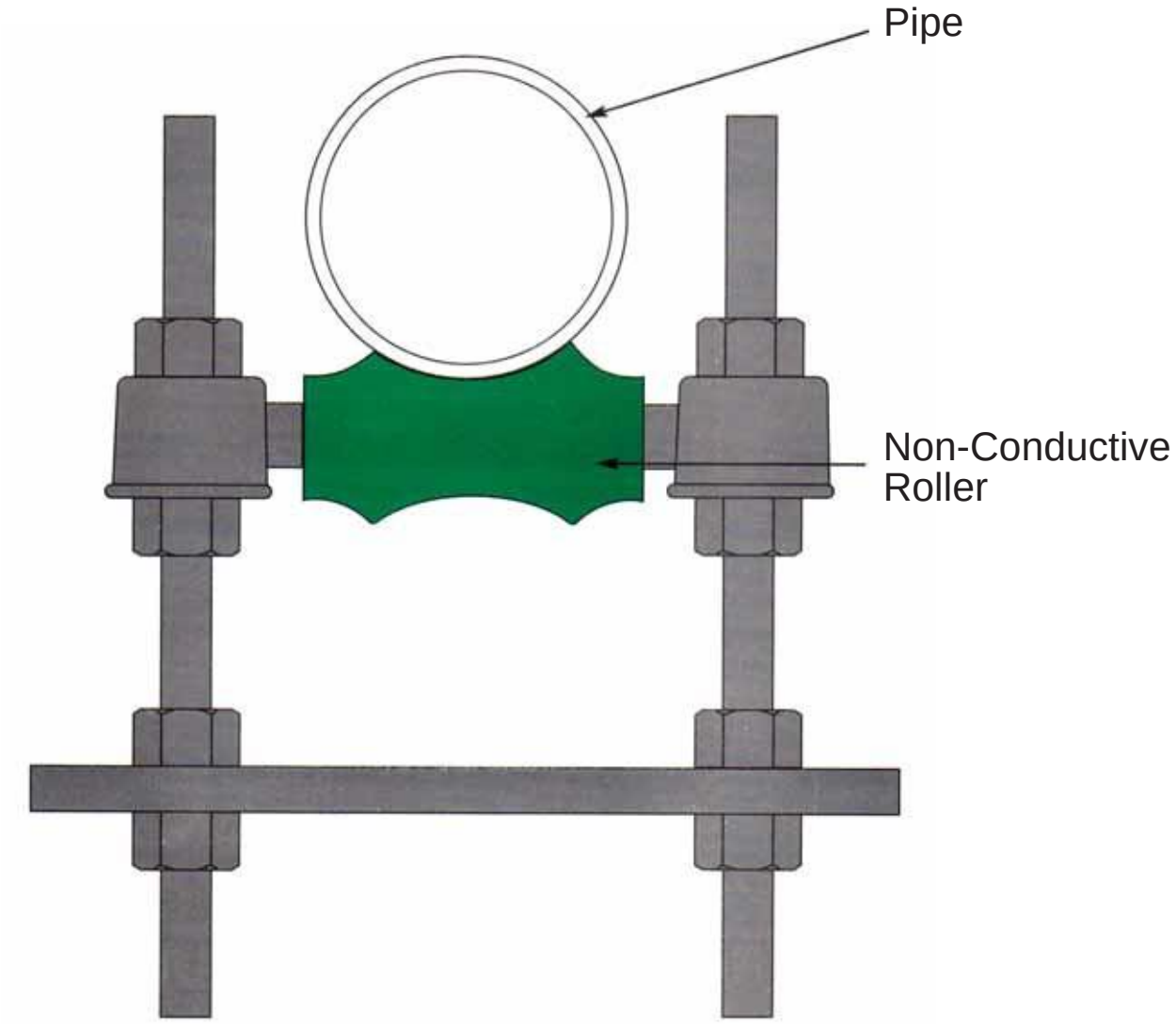
Recommendation: FRP Type #240 Shield & Non-Conductive Roller
Reasons: Protects tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation
Non-Conductive Roller will not bind



Side View: FRP Type #240 Shield
Non-Conductive Roller

ADJUSTABLE ROLL SUPPORT (2B)

PAINTED OR BARE STEEL PIPE



Recommendation: Non-Conductive Pipe Roller

Reasons: Eliminates the possibility of moisture entrapment
Roller will not bind or abrade the paint
Maintains electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: PAINTED OR BARE STEEL PIPE

Recommendation:

Non-Conductive Rollers should be used in lieu of, or as a direct replacement for, cast iron rolls on any bridge main installation that is, or is going to be, painted. This applies for both existing and new mains. Most paints provide only a thin barrier and are extremely susceptible to abrasion damage. This is particularly true at each pipe to support contact.

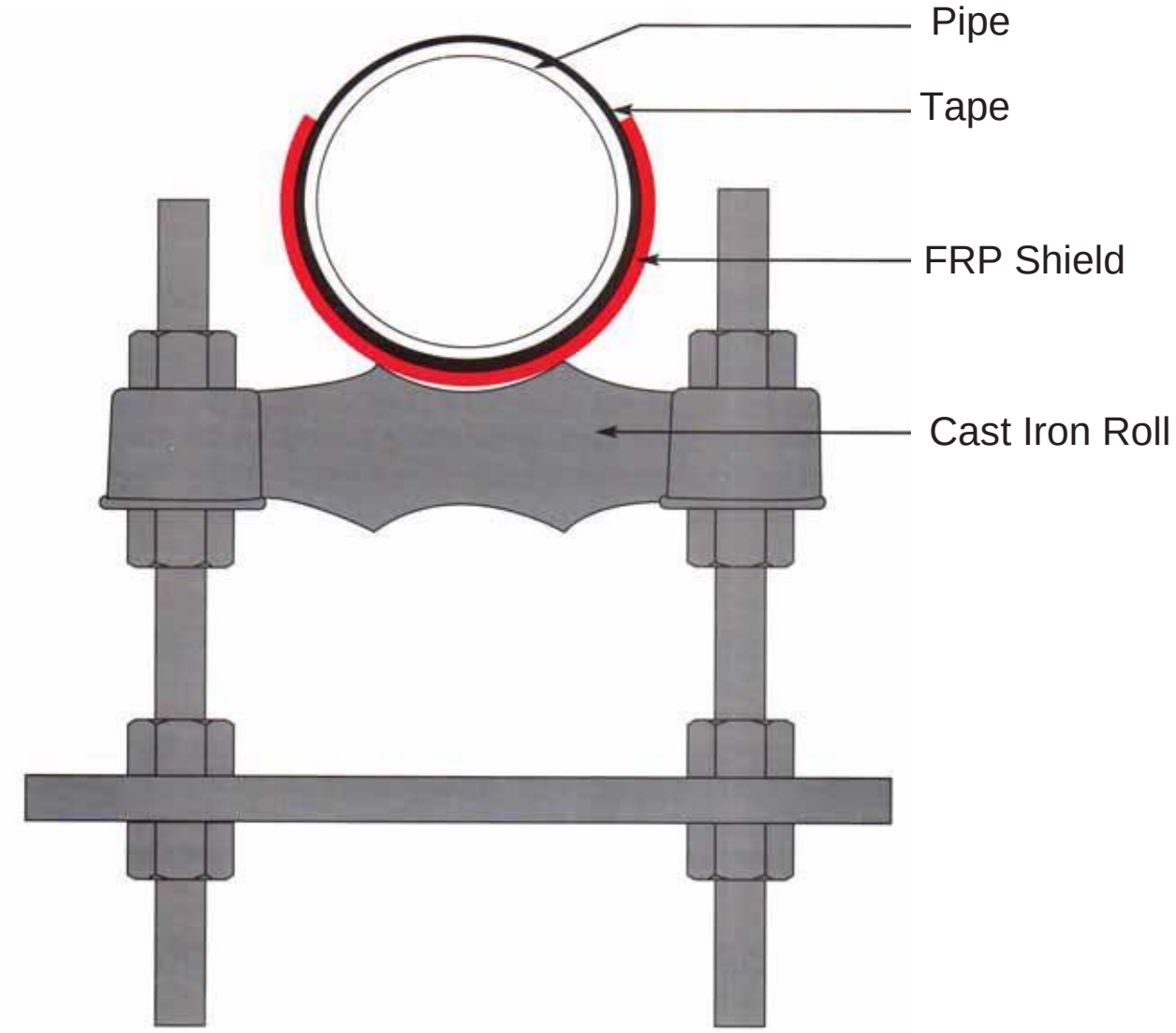
Reasons:

The polyurethane based Non-Conductive Rollers are best used alone with thin coatings because they are non-abrasive and maintain a minimum surface contact. This eliminates any possibility of moisture collecting between the pipe and support. In addition, the Non-Conductive Rollers are solid and do not have the same tendency to bind as the hollow cast iron rolls. Lubricating the roller's stainless steel sleeve prior to inserting the axle seals out moisture and reduces friction.

When a pipe has a thin barrier coating the use of an FRP Shield increases the possibility of moisture entrapment between the pipe and shield interface. In most cases this would aggravate any corrosive conditions located between the pipe and FRP Shield.

ADJUSTABLE ROLL SUPPORT (2B)

TAPE COATED STEEL PIPE WITH CAST IRON ROLLER



Recommendation: FRP Type # 240 Shield

Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP COATING WITH CAST IRON ROLL

Recommendation:

A Type # 240 Shield needs to be installed with any factory or field applied tape. This is particularly important when cast iron rolls are used. The profile of cast iron rolls do not accommodate thick barrier coatings. The tapes change the OD of the pipe to the point it will no longer rest in the cradle of the roll as is the case with bare or painted pipes. Instead, the pipe will rest on the peaks of the roll. This situation aggravates the point loading that normally occurs at each of the pipe's support.

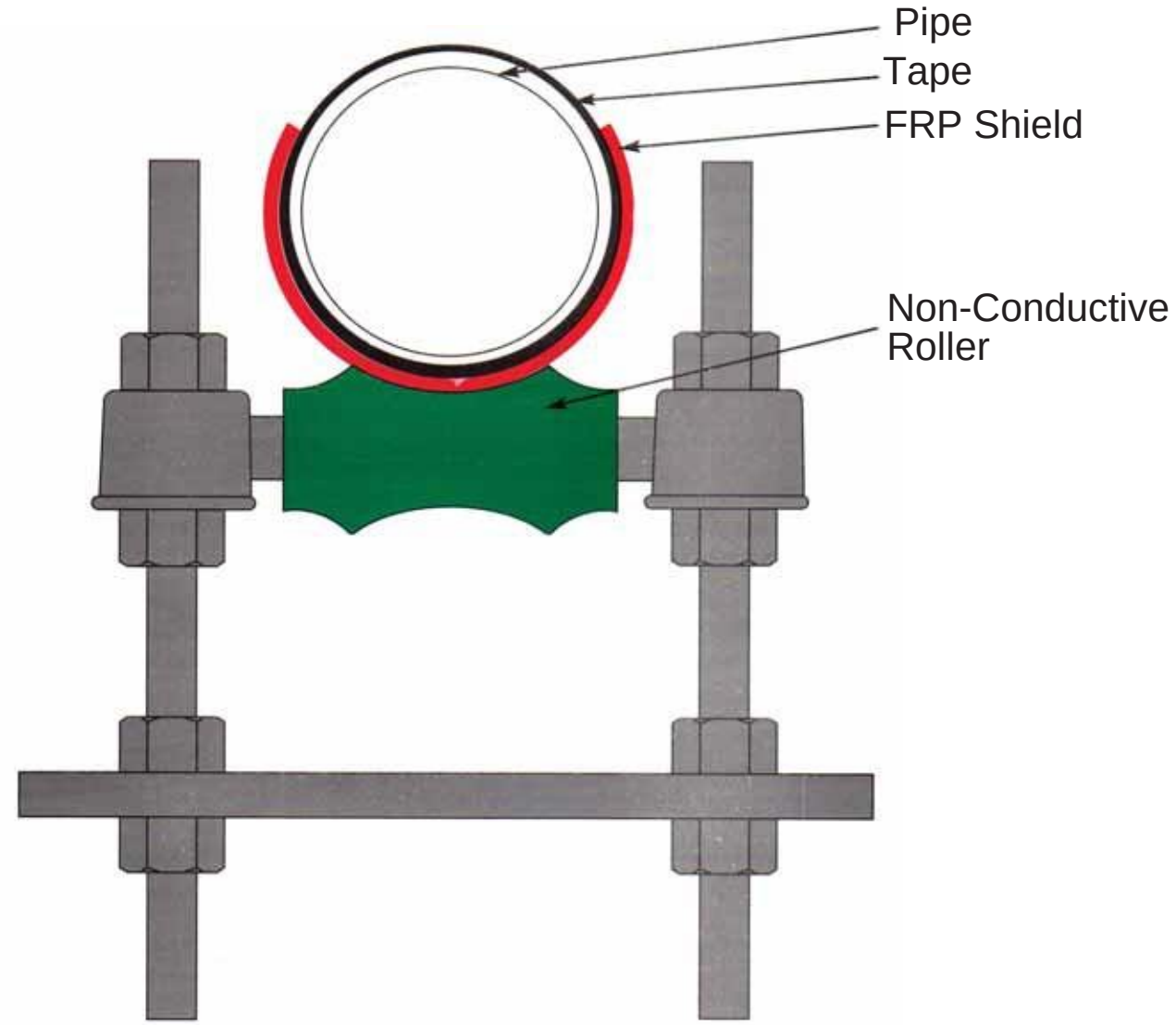
Reasons:

Tape wraps are a thick barrier coating that must be protected at each support. Without protection the tape will cold flow as a result of being sandwiched between the pipe and its support. Abrasion due to even minor thermal expansion and contraction will further compromise the integrity of the tape. Fiberglass reinforcement enables the FRP Shields to tolerate the point loading and prevent abrasion damage by providing a desirable weight distribution. The FRP Shields also ensure a high degree of electrical isolation.

Unlike non-reinforced plastics, the Fiberglass Reinforced Shields do not get brittle in the cold and are resistant to UV degradation.

ADJUSTABLE ROLL SUPPORT (2B)

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLER



Recommendation: FRP Type #240 Shield & Non-Conductive Roller

Reasons:
- Protects tape from abrasion
- Prevents cold flow of the tape
- Ensures electrical isolation
- Non-Conductive Roller will not bind

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP WITH NON-CONDUCTIVE ROLLER ™

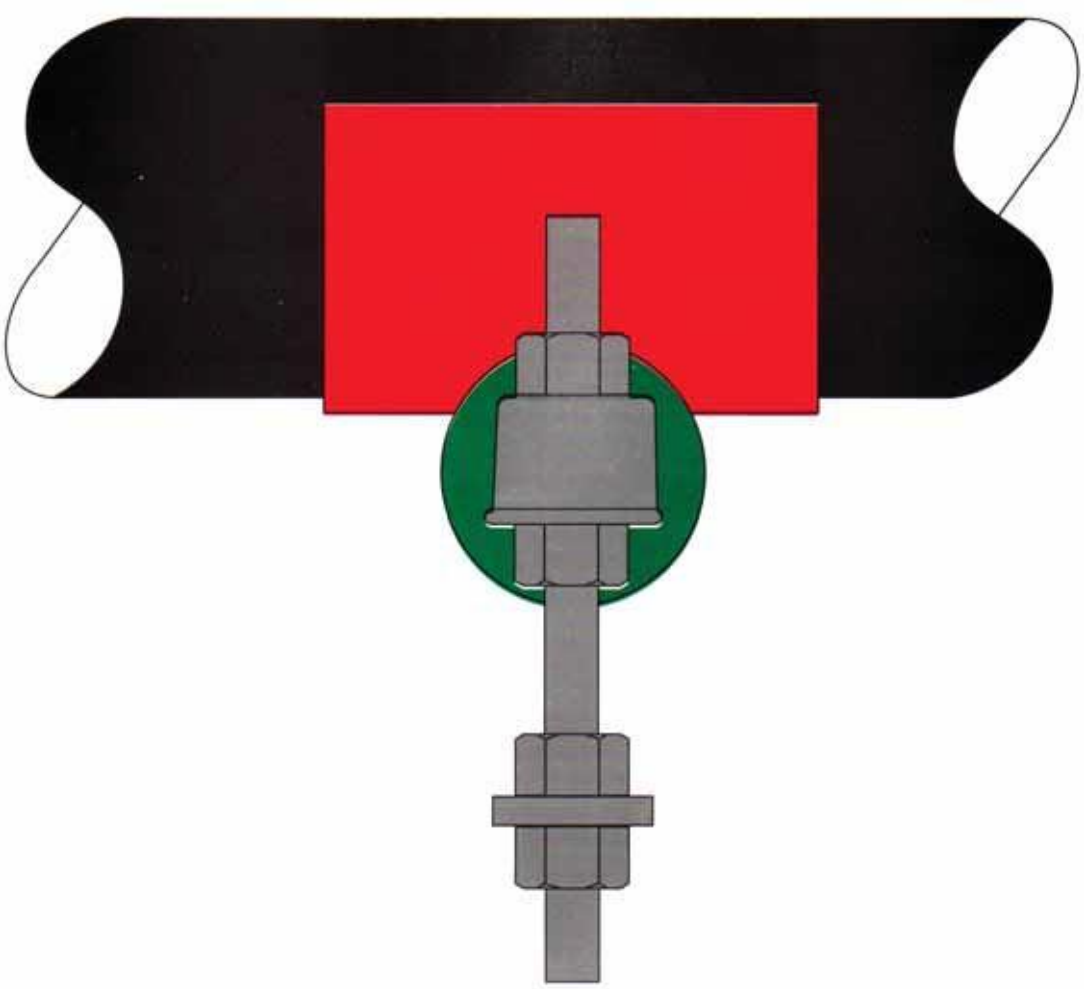
Recommendation:

A Type # 240 Shield needs to be installed with any factory or field applied tape. This is the case even when Non-Conductive Roller are used. The profile of a urethane roller is designed to accommodate both the tape wrap and FRP Shield. Although the Non-Conductive Rollers greatly reduce the possibility of abrasion, the tape must still be protected from cold flow damage. FRP Shields prevent damage by providing the necessary weight distribution between the pipe and its support. This is particularly important if the pipe becomes misaligned.

Reasons:

When used together, the Non-Conduction Rollers and FRP Shields provide the best possible protection for any tape type wrap. Unlike hollow cast iron rolls, the Non-Conductive Rollers are solid and do not tend to bind and will not corrode internally. The urethane composition stays flexible even in cold temperatures. This provide a degree of vibration tolerate which is one of the primary causes for alignment problems. Lubrication the roller's stainless steel sleeves seals out moisture and reduces friction. FRP Shields maintain the tape's integrity against both normal and possible abnormal loading due to misalignments and/or support failure.

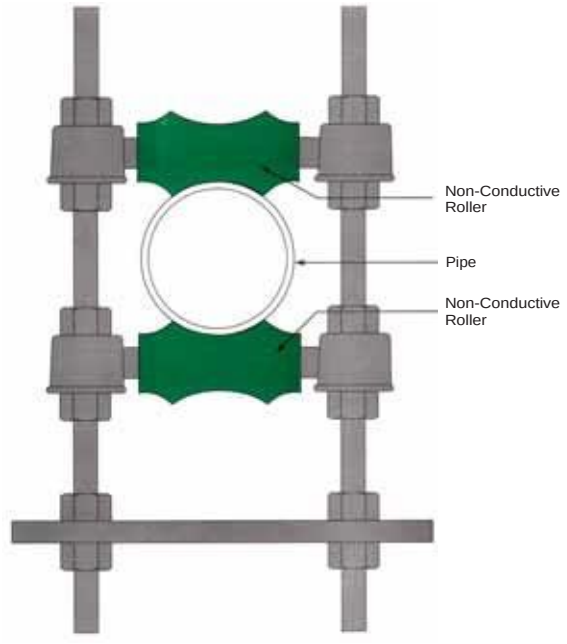
ADJUSTABLE ROLL SUPPORT (2B)



Side View: FRP Type #240 Shield
Non-Conductive Roller

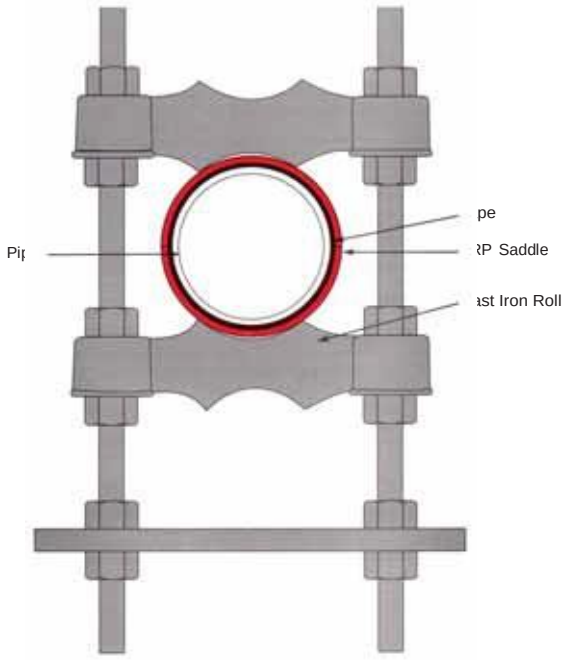
ADJUSTABLE ROLL GUIDE (3B)

PAINTED OR BARE STEEL PIPE



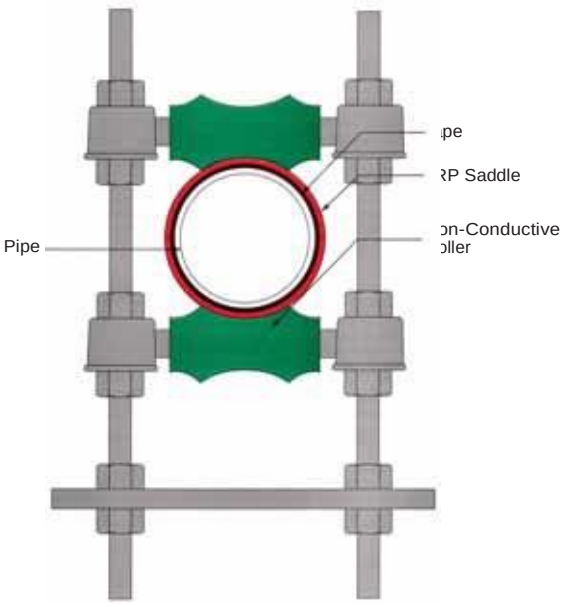
Recommendation: Non-Conductive Pipe Roller
Reasons: Eliminates the possibility of moisture entrapment
Roller will not bind
Maintains electrical isolation

TAPE COATED STEEL PIPE WITH CAST IRON ROLLS

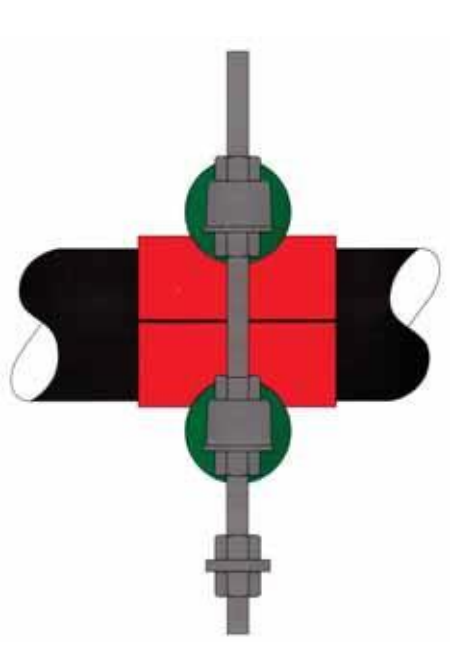


Recommendation: FRP Type #180 Saddles
Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLERS



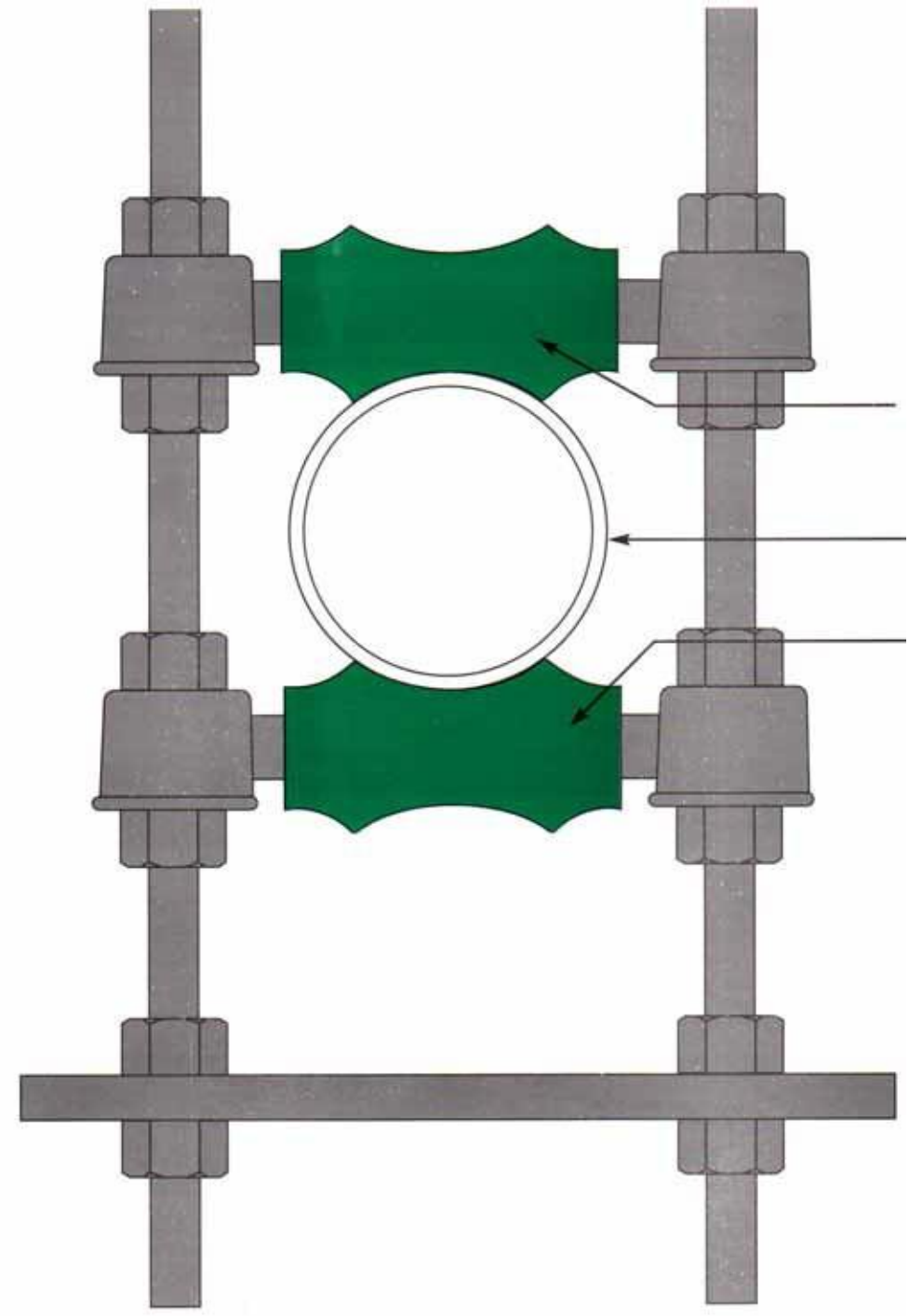
Recommendation: FRP Type #180 Saddles & Non-Conductive Rollers
Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensures electrical isolation
Non-Conductive Rollers will not bind



Side View: FRP Type #180 Saddles
Non-Conductive Pipe Rollers

ADJUSTABLE ROLL GUIDE (3B)

PAINTED OR BARE STEEL PIPE



Recommendation: Non-Conductive Pipe Roller

Reasons: Eliminates the possibility of moisture entrapment
Roller will not bind
Maintains electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: PAINTED OR BARE STEEL PIPE

Recommendation:

Non-Conductive Rollers should be used in lieu of, or as a direct replacement for, cast iron rolls on any bridge main installation that is, or is going to be, painted. This applies for both existing and new mains. Most paints provide only a thin barrier and are extremely susceptible to abrasion damage. This is particularly true at each pipe to support contact.

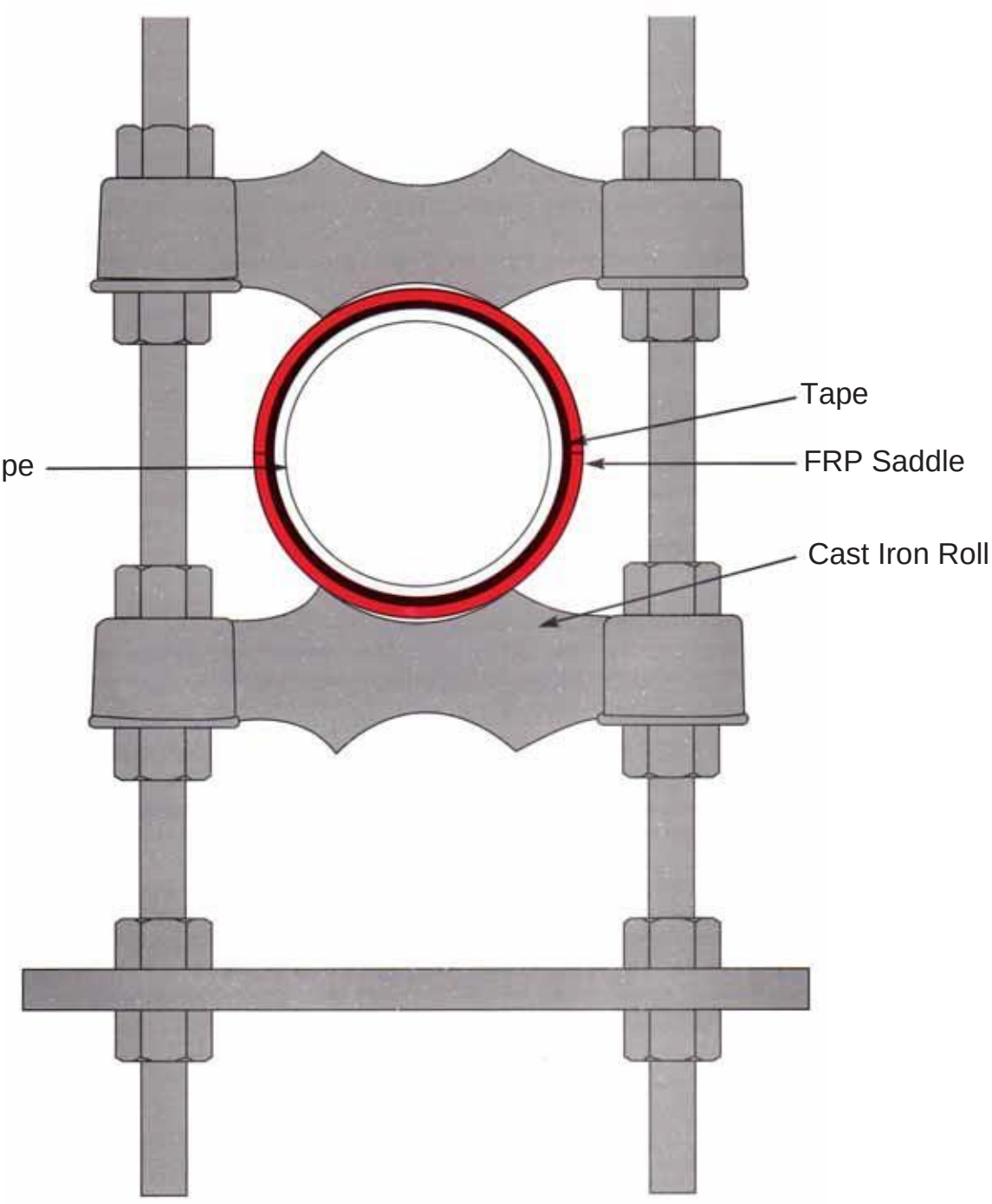
Reasons:

The polyurethane based Non-Conductive Rollers are best used alone with thin coatings because they are non-abrasive and maintain a minimum surface contact. This eliminates any possibility of moisture collecting between the pipe and support. In addition, the Non-Conductive Rollers are solid and do not have the same tendency to bind as the hollow cast iron rolls. Lubricating the roller's stainless steel sleeve prior to inserting the axle seals out moisture and reduces friction.

When a pipe has a thin barrier coating the use of an FRP Shield increases the possibility of moisture entrapment between the pipe and shield interface. In most cases this would aggravate any corrosive conditions located between the pipe and FRP Shield.

ADJUSTABLE ROLL GUIDE (3B)

TAPE COATED STEEL PIPE WITH CAST IRON ROLLS



Recommendation:	FRP Type #180 Saddles
Reasons:	Protects the tape from abrasion
	Prevents cold flow of the tape
	Ensures electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP COATING WITH CAST IRON ROLL

Recommendation:

Type #180 Saddles need to be installed with any factory or field applied tape that is used with an adjustable roll guide (3B). This is particularly important when cast iron rolls are used. The profile of cast iron rolls do not accommodate thick barrier coatings. The tapes change the OD of the pipe to the point it will no longer rest in the cradle of the roll as is the case with bare or painted pipes. Instead, the pipe will rest on the peaks of the roll. This situation aggravates the point loading that normally occurs at each of the pipe's supports.

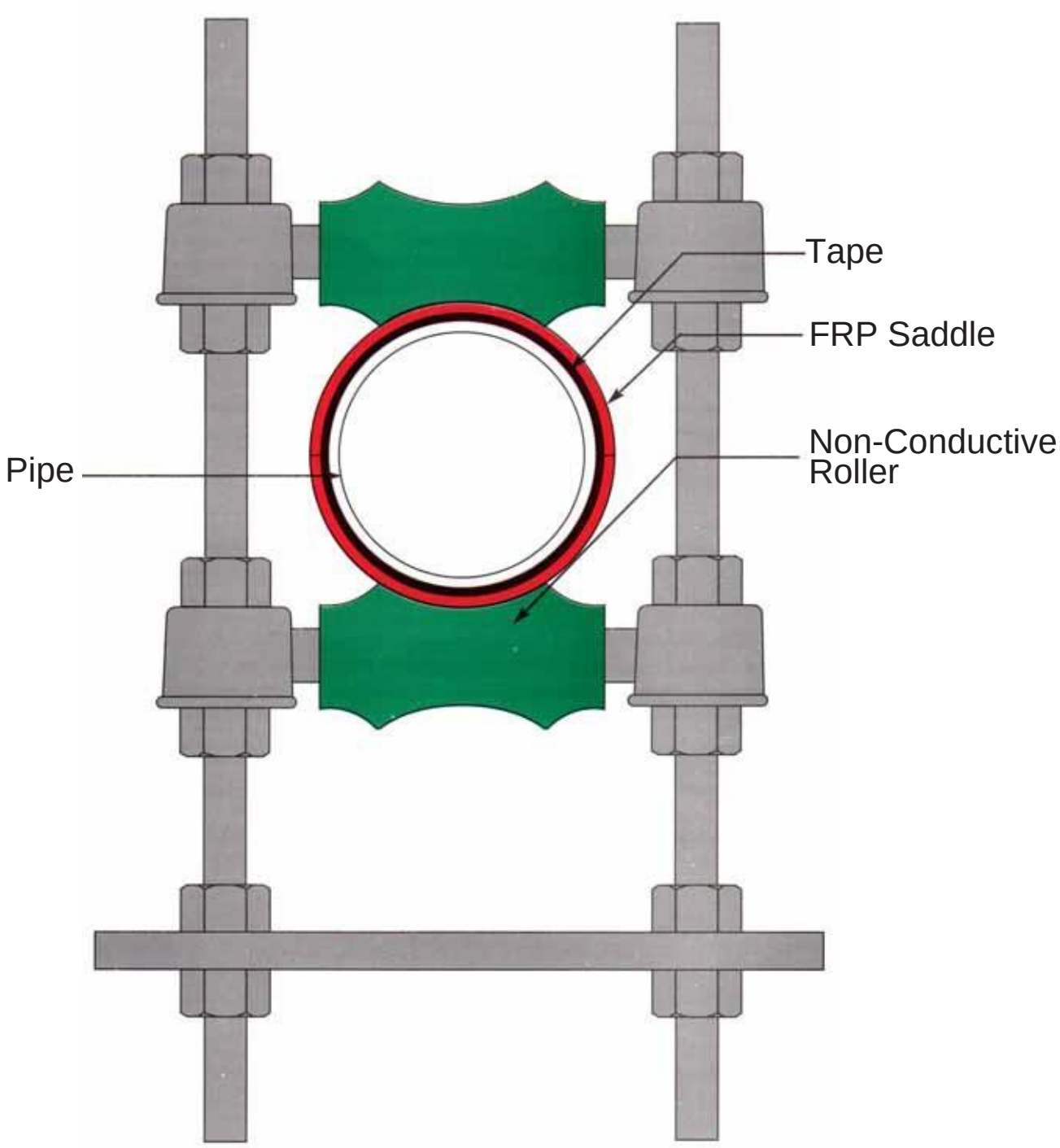
Reasons:

Tape wraps are a thick barrier coating that must be protected at each support. Without protection the tape will cold flow as a result of being sandwiched between the pipe and its support. Abrasion due to even minor thermal expansion and contraction will further compromise the integrity of the tape. Fiberglass reinforcement enables the FRP Shields to tolerate the point loading and prevent abrasion damage by providing a desirable weight distribution. The FRP Shields also ensure a high degree of electrical isolation.

Unlike non-reinforced plastics, the Fiberglass Reinforced Shields do not get brittle in the cold and are resistant to UV degradation.

ADJUSTABLE ROLL GUIDE (3B)

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLERS



Recommendation:	FRP Type #180 Saddles & Non-Conductive Rollers
Reasons:	Protects the tape from abrasion
	Prevents cold flow of the tape
	Ensures electrical isolation
	Non-Conductive Rollers will not bind

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP WITH NON-CONDUCTIVE ROLLER™

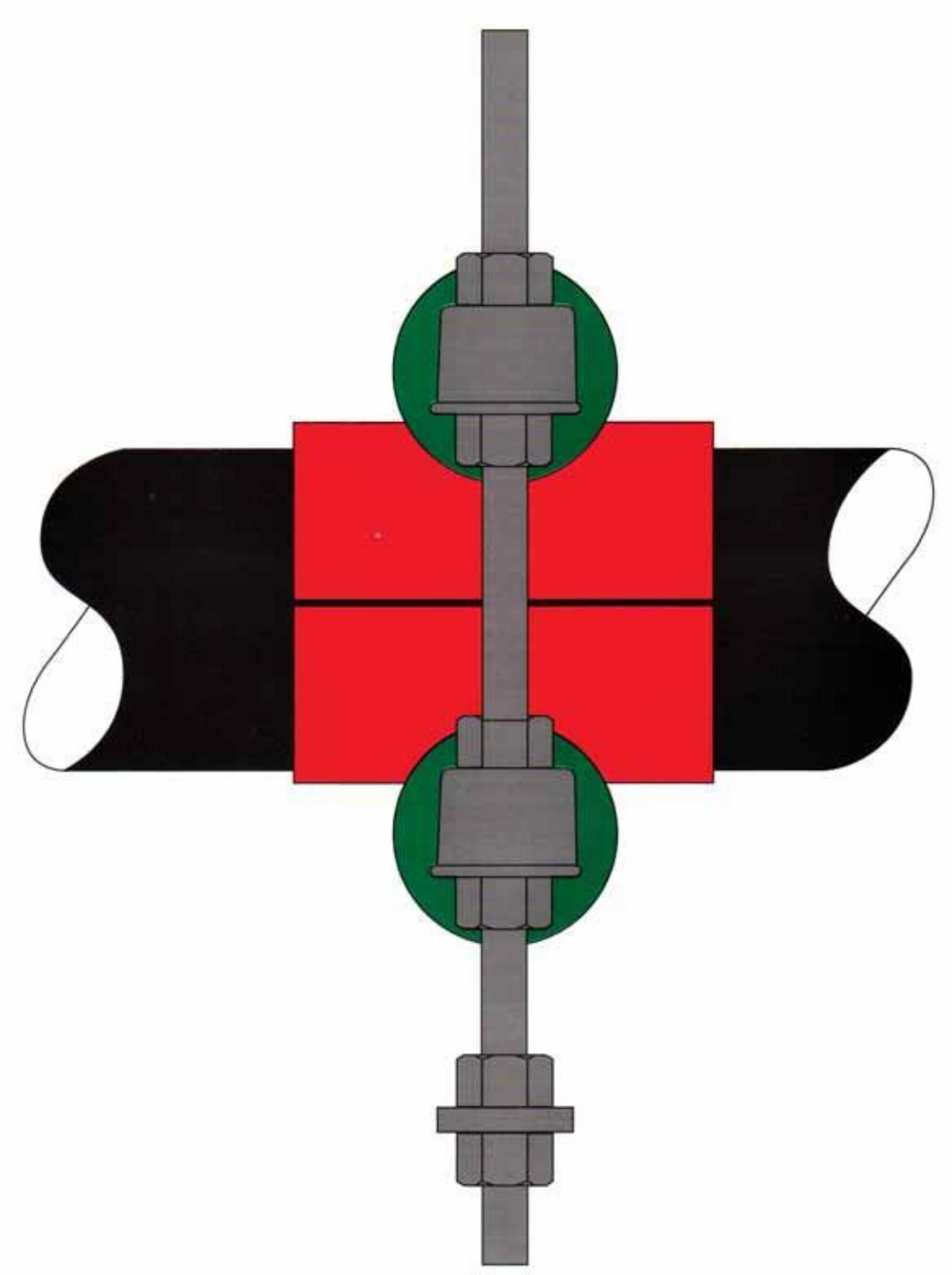
Recommendation:

Type #180 Saddles need to be installed with any factory or field applied tape that is used with an adjustable roll guide (3B). This is the case even when Non-Conductive Rollers are used. The profile of a urethane roller is designed to accommodate both the tape wrap and FRP Saddle. Although the Non-Conductive Rollers greatly reduce the possibility of abrasion, the tape must still be protected from cold flow damage. FRP Saddles prevent damage by providing the necessary weight distribution between the pipe and its support. This is particularly important if the pipe becomes misaligned.

Reasons:

When used together, the Non-Conduction Rollers and FRP Shields provide the best possible protection for any tape type wrap. Unlike hollow cast iron rolls, the Non-Conductive Rollers are solid and do not tend to bind and will not corrode internally. The urethane composition stays flexible even in cold temperatures. This provide a degree of vibration tolerate which is one of the primary causes for alignment problems. Lubrication the roller's stainless steel sleeves seals out moisture and reduces friction. FRP Shields maintain the tape's integrity against both normal and possible abnormal loading due to misalignments and/or support failure.

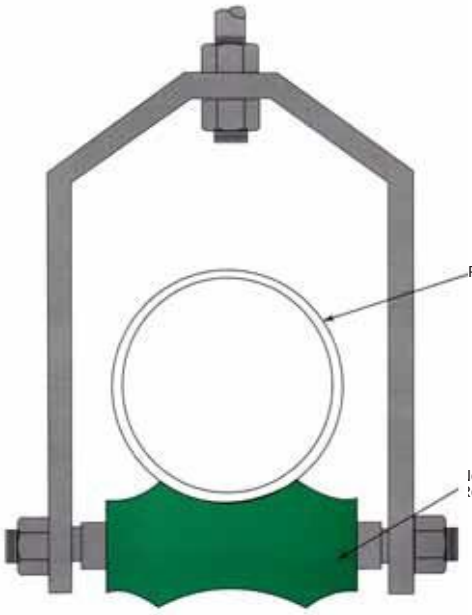
ADJUSTABLE ROLL GUIDE (3B)



Side View: FRP Type #180 Saddles
Non-Conductive Pipe Rollers

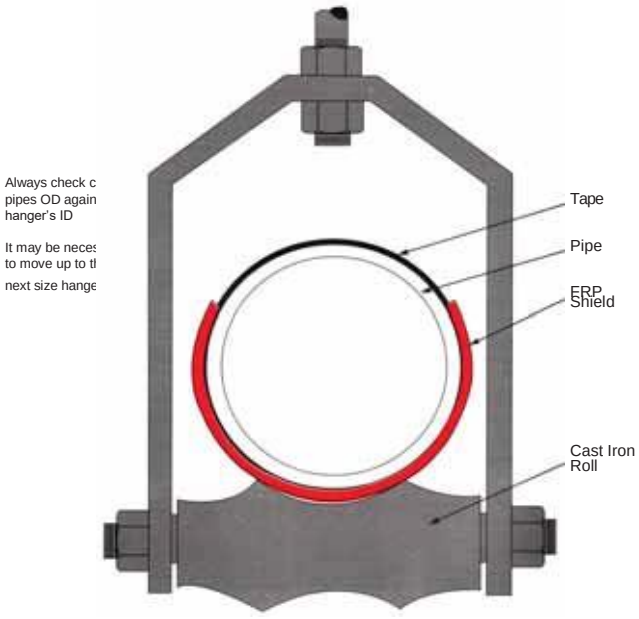
ADJUSTABLE ROLLER HANGER (4B)

PAINTED OR BARE STEEL PIPE



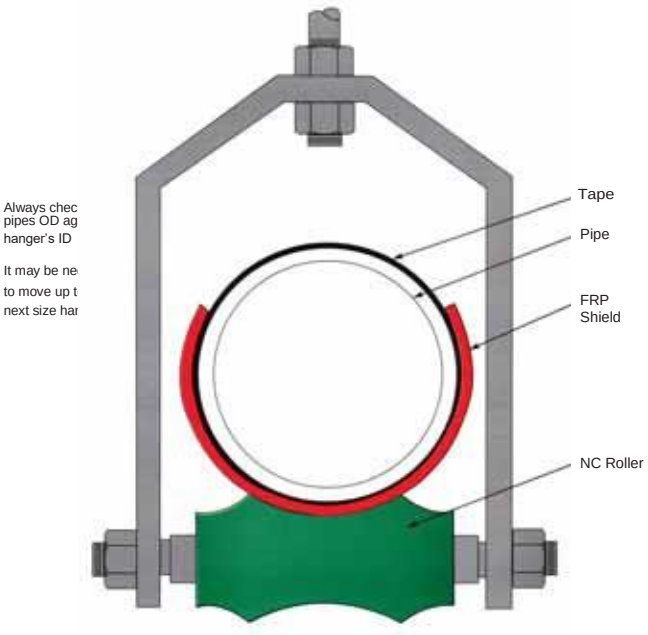
Recommendation: Non-Conductive Pipe Roller
Reasons: Eliminates the possibility of moisture entrapment
Roller will not bind
Maintains electrical isolation

TAPE COATED STEEL PIPE WITH CAST IRON ROLLS

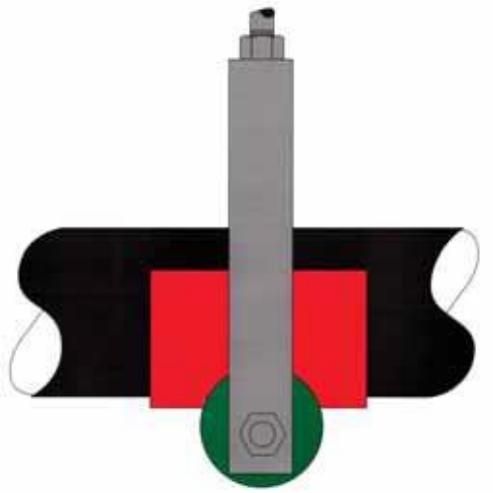


Recommendation: FRP Type #240 Saddles
Reasons: Protects the tape from abrasion
Prevents cold flow of the tape
Ensure electrical isolation

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLERS



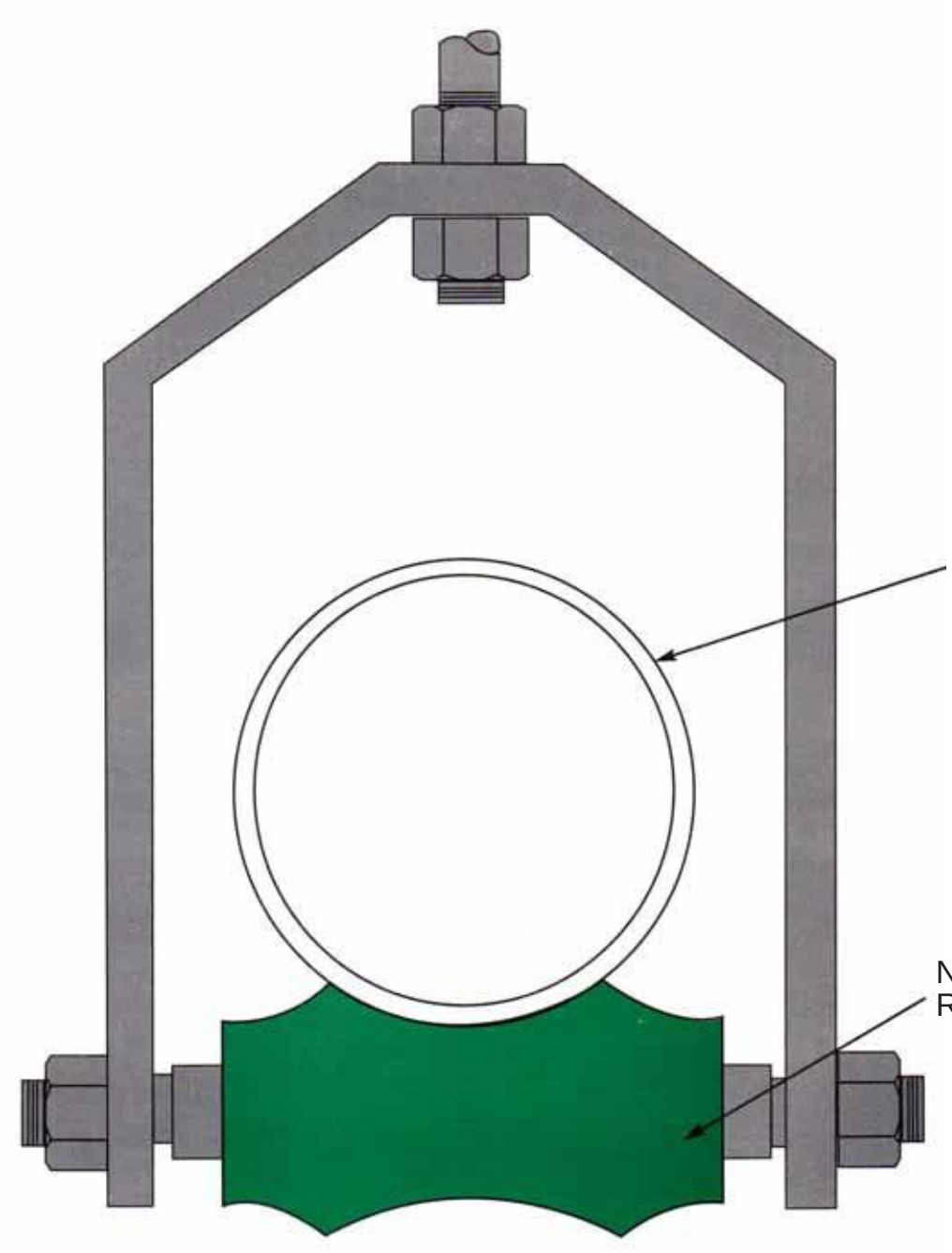
Recommendation: FRP Type #240 Shields
Reasons: Prevents cold flow of the tape
Ensure electrical isolation
Non-Conductive Roller will not bind



Side View: Type #240 Shield
Non-Conductive Pipe Roll

ADJUSTABLE ROLLER HANGER (4B)

PAINTED OR BARE STEEL PIPE



Recommendation: Non-Conductive Pipe Roller

Reasons: Eliminates the possibility of moisture entrapment
Roller will not bind
Maintains electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: PAINTED OR BARE STEEL PIPE

Recommendation:

Non-Conductive Rollers should be used in lieu of, or as a direct replacement for, cast iron rolls on any bridge main installation that is, or is going to be, painted. This applies for both existing and new mains. Most paints provide only a thin barrier and are extremely susceptible to abrasion damage. This is particularly true at each pipe to support contact.

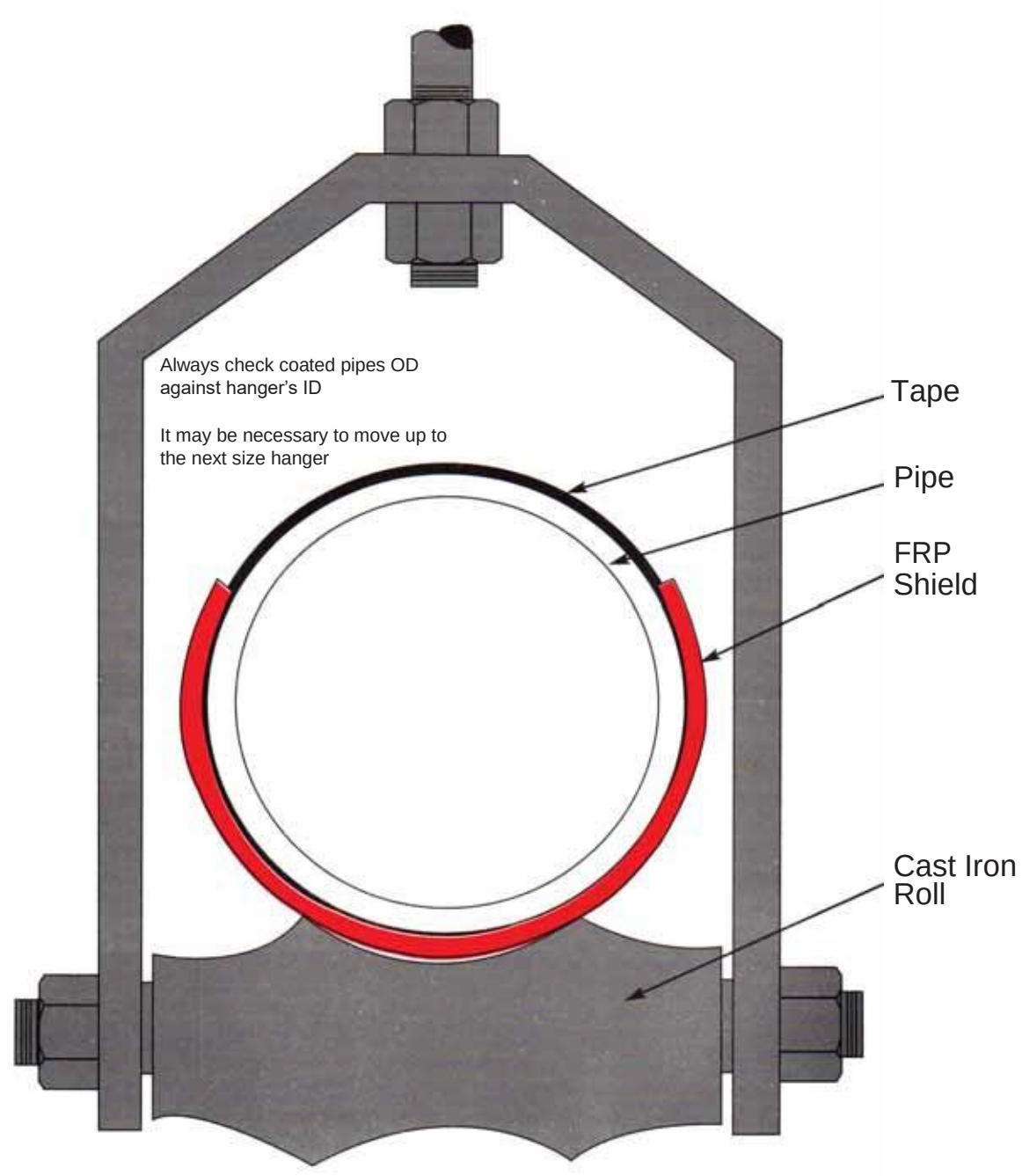
Reasons:

The polyurethane based Non-Conductive Rollers are best used alone with thin coatings because they are non-abrasive and maintain a minimum surface contact. This eliminates any possibility of moisture collecting between the pipe and support. In addition, the Non-Conductive Rollers are solid and do not have the same tendency to bind as the hollow cast iron rolls. Lubricating the roller's stainless steel sleeve prior to inserting the axle seals out moisture and reduces friction.

When a pipe has a thin barrier coating the use of an FRP Shield increases the possibility of moisture entrapment between the pipe and shield interface. In most cases this would aggravate any corrosive conditions located between the pipe and FRP Shield.

ADJUSTABLE ROLLER HANGER (4B)

TAPE COATED STEEL PIPE WITH CAST IRON ROLLS



Recommendation:	FRP Type #240 Saddles
Reasons:	Protects the tape from abrasion
	Prevents cold flow of the tape
	Ensure electrical isolation

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP COATING WITH CAST IRON ROLL

Recommendation:

A Type #240 Shield needs to be installed with any factory or field applied tape. This is particularly important when cast iron rolls are used. The profile of cast iron rolls do not accommodate thick barrier coatings. The tapes change the OD of the pipe to the point it will no longer rest in the cradle of the roll as is the case with bare or painted pipes. Instead, the pipe will rest on the peaks of the roll. This situation aggravates the point loading that normally occurs at each of the pipe's support.

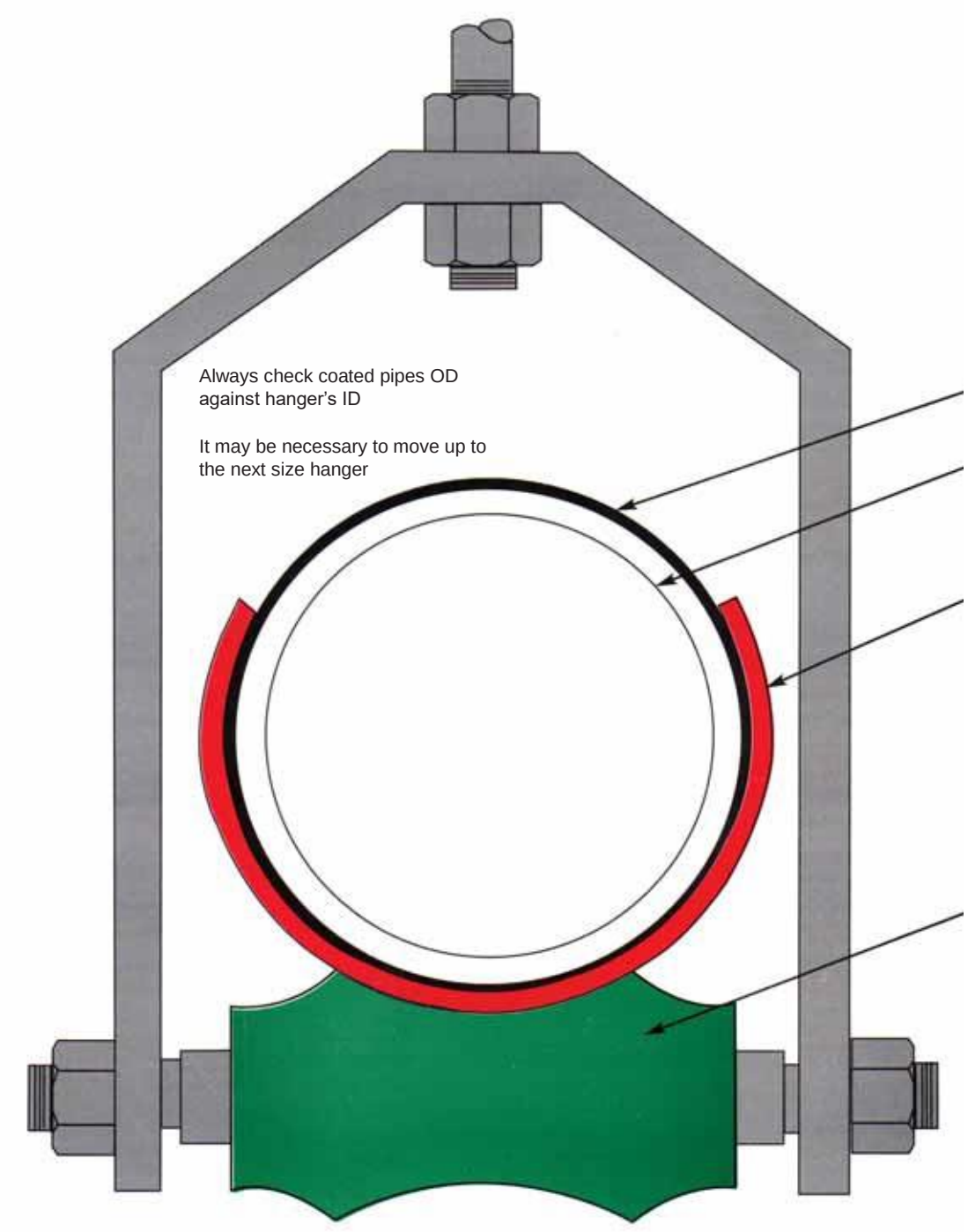
Reasons:

Tape wraps are a thick barrier coating that must be protected at each support. Without protection the tape will cold flow as a result of being sandwiched between the pipe and its support. Abrasion due to even minor thermal expansion and contraction will further compromise the integrity of the tape. Fiberglass reinforcement enables the FRP Shields to tolerate the point loading and prevent abrasion damage by providing a desirable weight distribution. The FRP Shields also ensure a high degree of electrical isolation.

Unlike non-reinforced plastics, the Fiberglass Reinforced Shields do not get brittle in the cold and are resistant to UV degradation.

ADJUSTABLE ROLLER HANGER (4B)

TAPE COATED PIPE WITH NON-CONDUCTIVE ROLLERS



Recommendation: FRP Type #240 Shields
Reasons: Prevents cold flow of the tape
Ensure electrical isolation
Non-Conductive Roller will not bind

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE WRAP WITH NON-CONDUCTIVE ROLLER ™

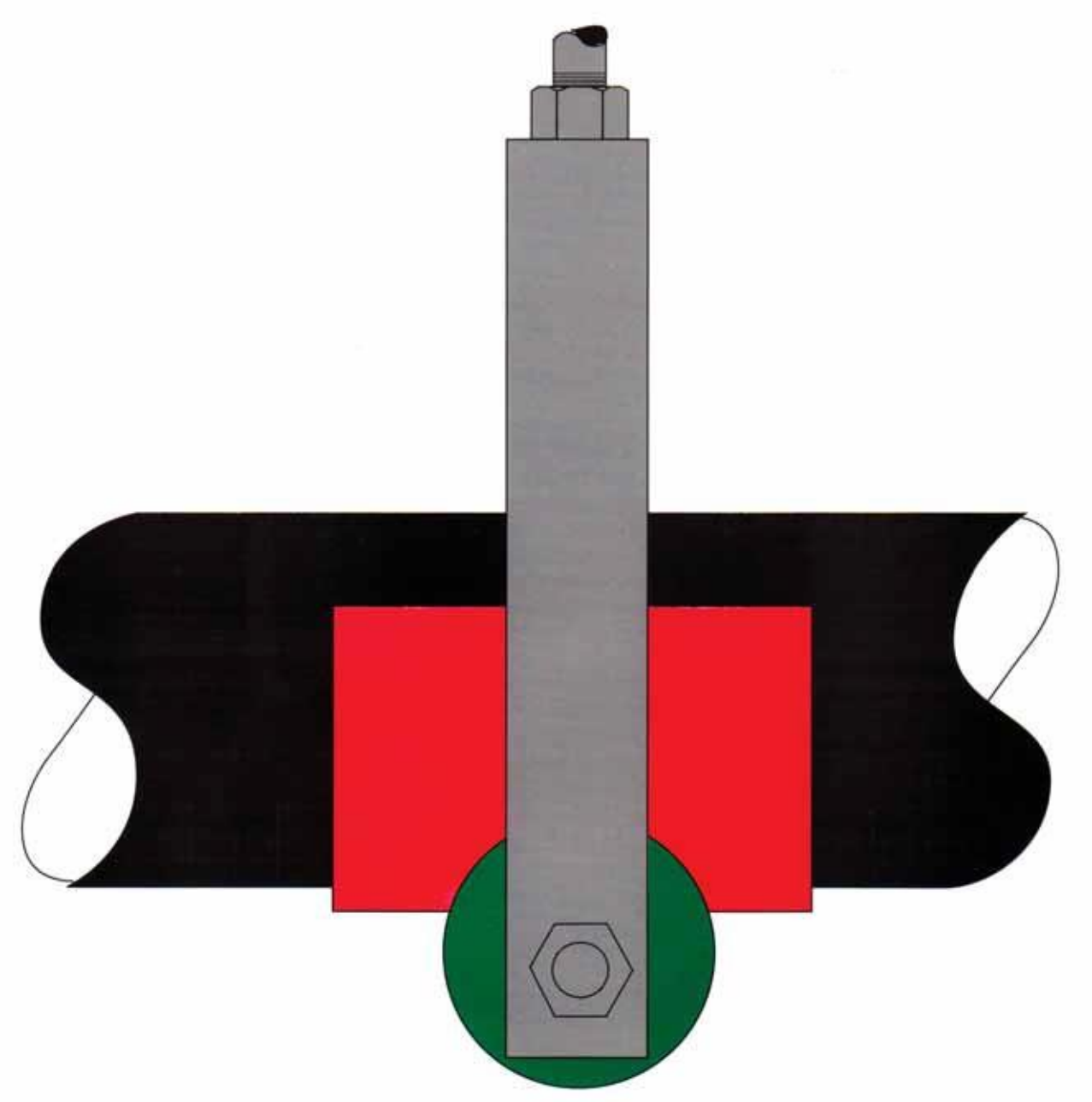
Recommendation:

A Type # 240 Shield needs to be installed with any factory or field applied tape. This is the case even when Non-Conductive Roller are used. The profile of a urethane roller is designed to accommodate both the tape wrap and FRP Shield. Although the Non-Conductive Rollers greatly reduce the possibility of abrasion, the tape must still be protected from cold flow damage. FRP Shields prevent damage by providing the necessary weight distribution between the pipe and its support. This is particularly important if the pipe becomes misaligned.

Reasons:

When used together, the Non-Conduction Rollers and FRP Shields provide the best possible protection for any tape type wrap. Unlike hollow cast iron rolls, the Non-Conductive Rollers are solid and do not tend to bind and will not corrode internally. The urethane composition stays flexible even in cold temperatures. This provide a degree of vibration tolerate which is one of the primary causes for alignment problems. Lubrication the roller's stainless steel sleeves seals out moisture and reduces friction. FRP Shields maintain the tape's integrity against both normal and possible abnormal loading due to misalignments and/or support failure.

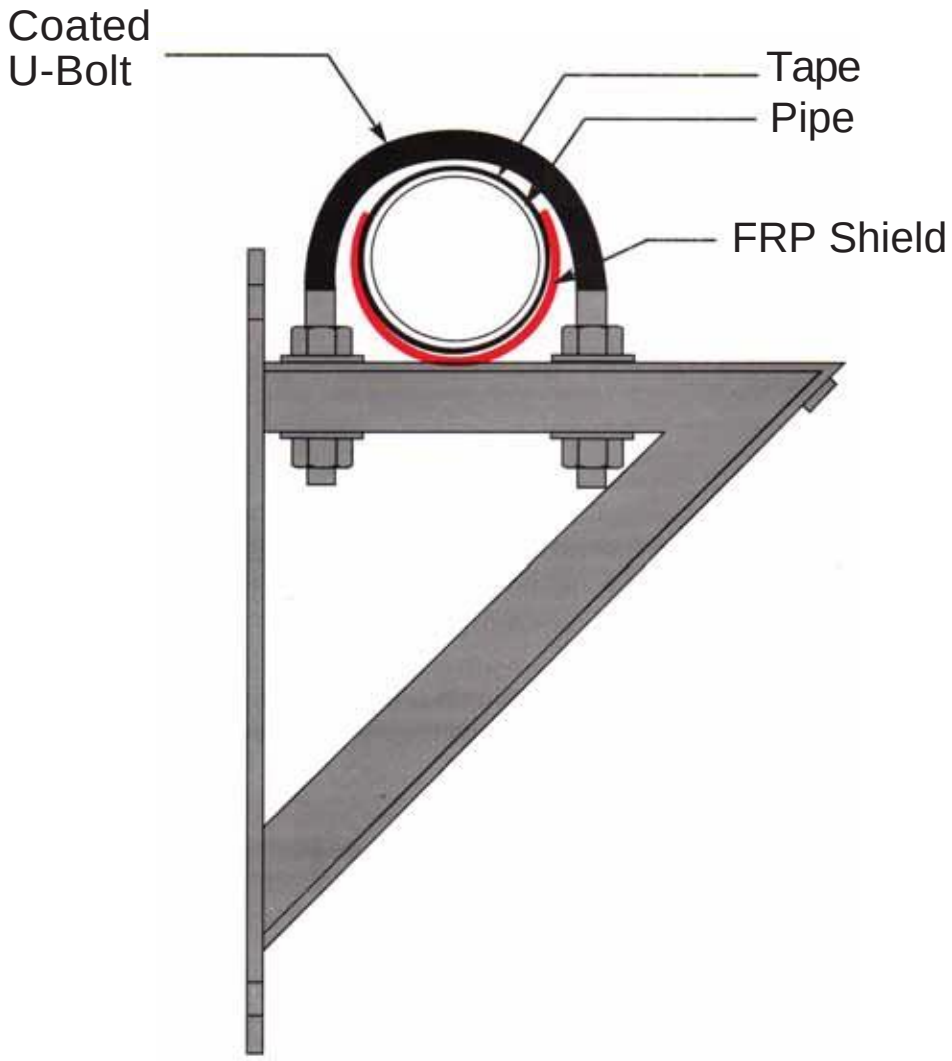
ADJUSTABLE ROLLER HANGER (4B)



Side View: FRP Type #240 Shield
Non-Conductive Pipe Roll

STEEL BRACKETS (15B)

TAPE COATED STEEL PIPE



Recommendation:	FRP Type #240 Shield & Coated U-Bolt
Reasons:	Protects tape from abrasion
	Electrically isolates pipe from support
	Prevents cold flow of the tape

PIPELINE BRIDGE CROSSINGS

CONDITION: TAPE COATING ON STEEL BRACKET, I-BEAM, ETC.

Recommendation:

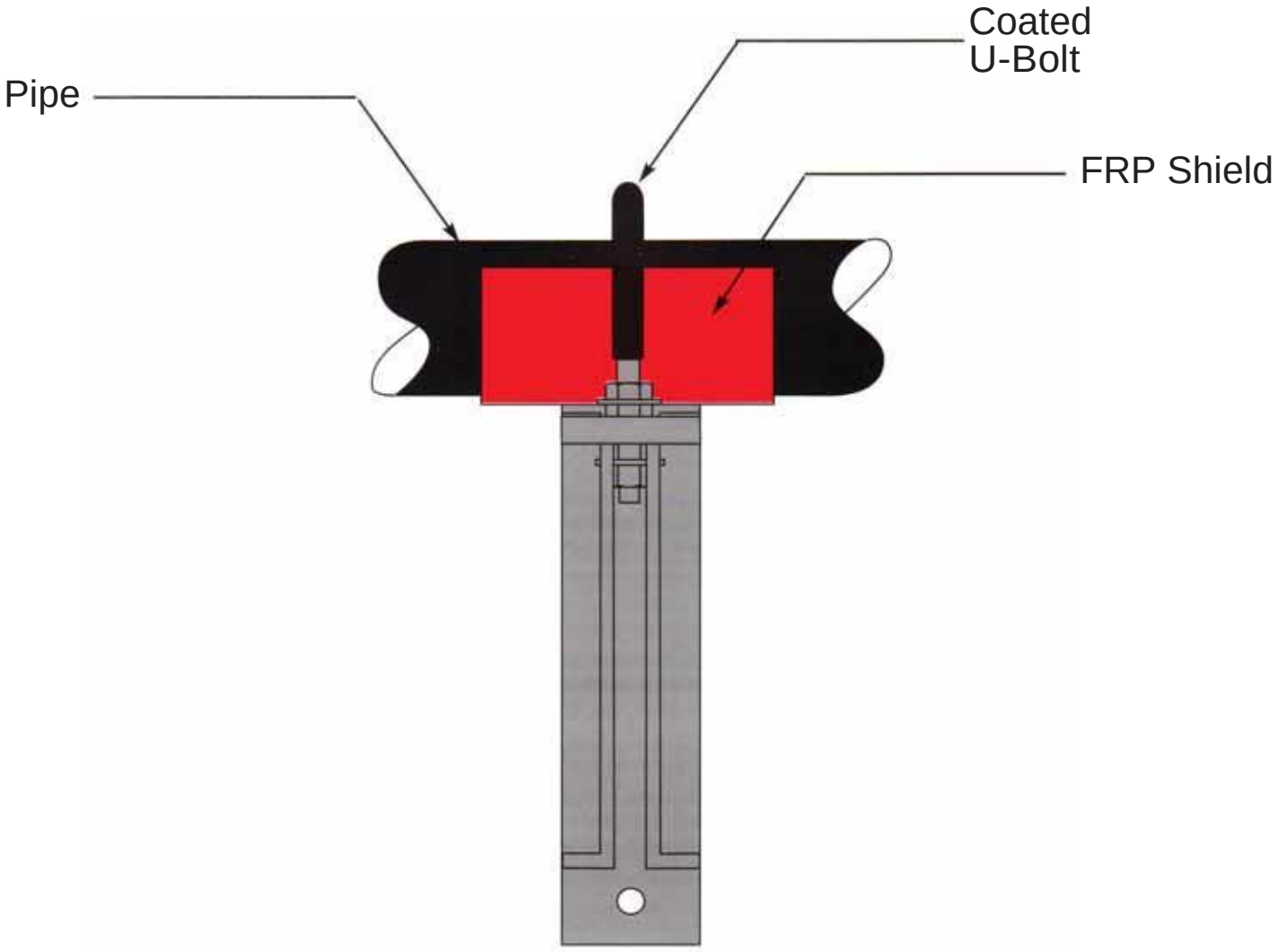
A Type #240 Shield needs to be installed with any factory or field applied tape. This is particularly important when the main is supported by steel brackets, I-beams, etc. Using a coated, hot dipped galvanized u-bolt as a guide will prevent any possible metal to metal contact. In order to have enough clearance the u-bolt will need to be sized up or fabricated with a special ID.

Reasons:

Tape wraps are a thick barrier coating that must be protected at each support. Without protection the tape will cold flow as a result of being sandwiched between the pipe and its support. Abrasion due to even minor thermal expansion and contraction will further compromise the integrity of the tape. Fiberglass reinforcement enables the FRP Shields to tolerate the point loading and prevent abrasion damage by providing a desirable weight distribution. The FRP Shields also ensure a high degree of electrical isolation. Unlike non-reinforced plastics, the Fiberglass Reinforced Shields do not get brittle in the cold and are resistant to UV degradation.

The coated u-bolts provide a corrosion resistant guide that maintains proper pipe alignment and eliminates the possibility of any metal to metal contact on the top third of the pipe.

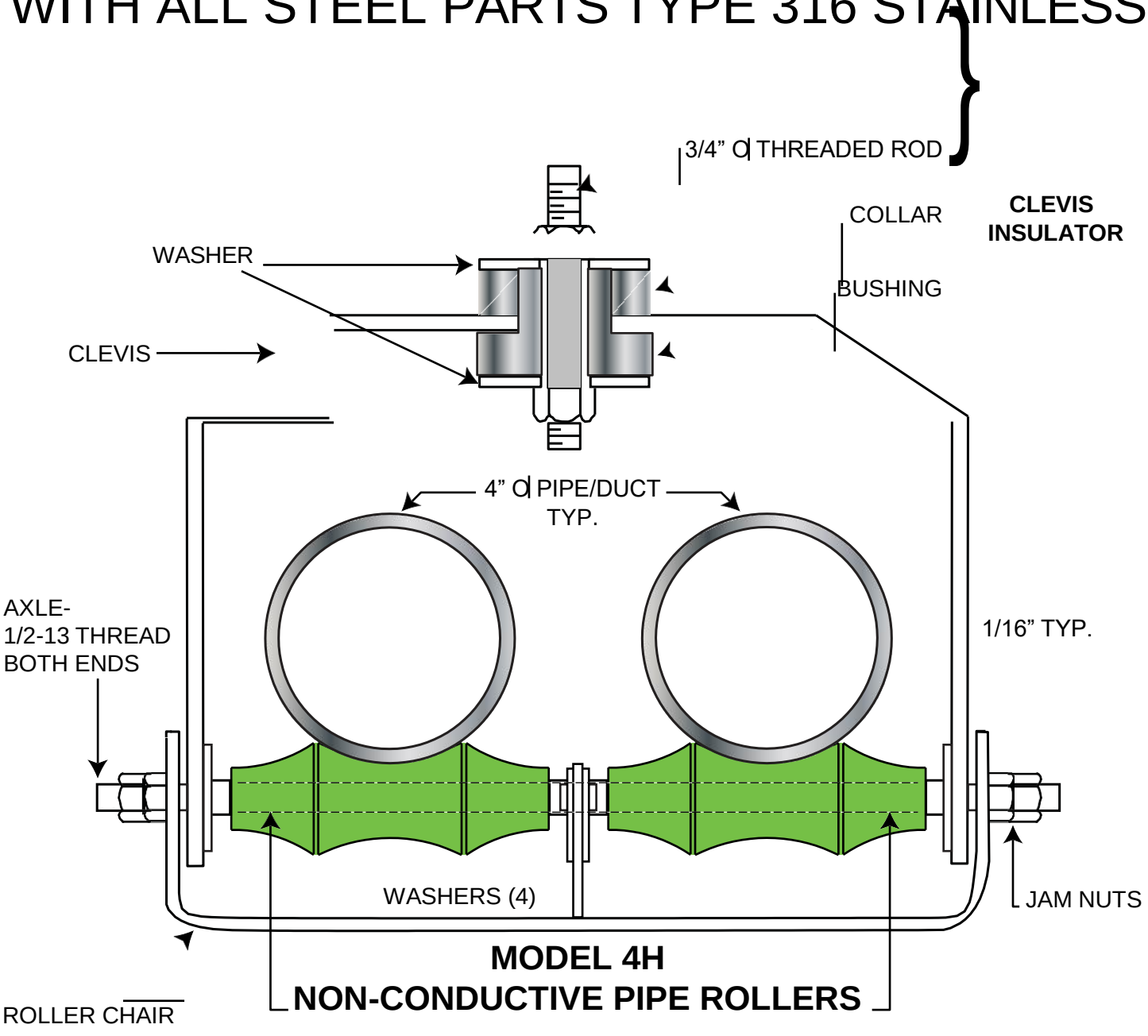
STEEL BRACKETS (15B)



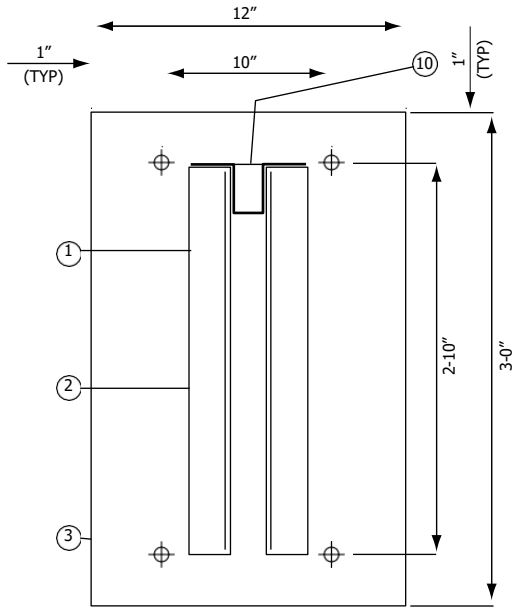
Side View: FRP Type #240 Shield
Coated U-Bolt

CORROSION RESISTANT AND REDUNDANTLY NON-CONDUCTIVE TWIN PIPE/DUCT HANGER SYSTEM

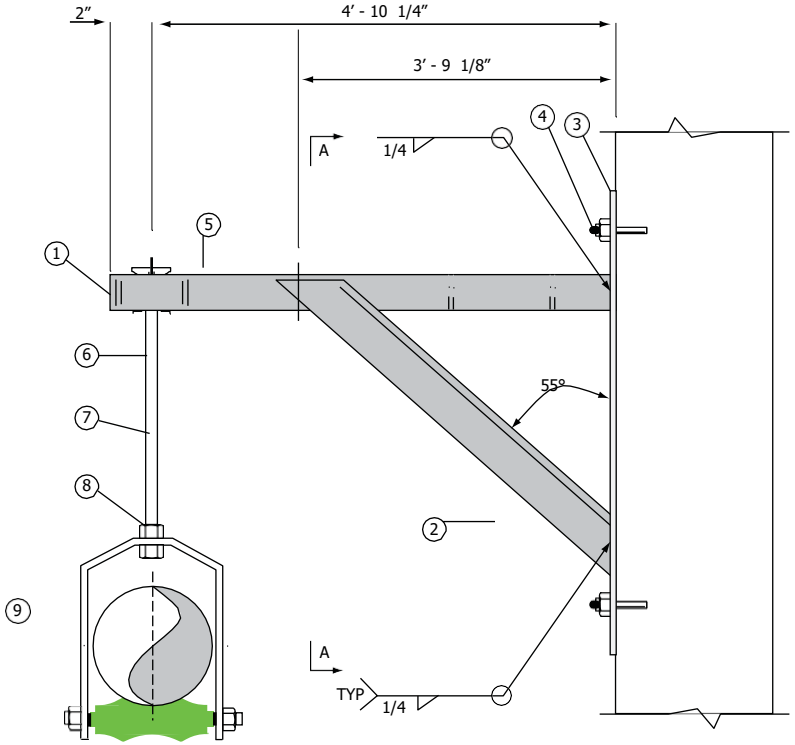
WITH ALL STEEL PARTS TYPE 316 STAINLESS



CRARNCTPDHS_11_08



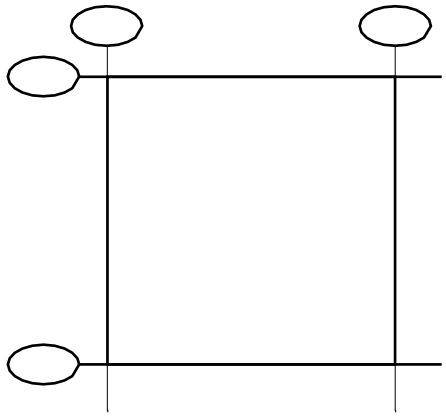
SECTION A-A



NOT TO SCALE

ELEVATION VIEW

ITEM	QTY	FIGURE NO.	FIN.	SIZE	LENGTH	MATERIAL DESCRIPTION
1	2	CS	HDG	L3	x3 x1/4	ANGLE x5′-0″LG.
2	2	CS	HDG	L2	x2 x1/4	ANGLE x4′-9 1/8″LG.
3	1	CS	HDG	1/4″	x12 x3′-0″LG.	PLATE W/(4) 5/8″ o HOLE
4	4	1309	SS	1/2″ o	x4 3/4″LG.	WEDGE ANCHOR (MIN.EMB.=2 3/4″)
5	2	260	HDG	5/8″		WASHER PLATE (FURNISHED LOOSE)
6	4	165	HDG	5/8″		HEAVY HEX NUT
7	1	94	HDG	5/8″ o	x3′-0″LG.	A.T. ROD
8	2	103	HDG	5/8″		ROUND WASHER PLATE
9	1	SP140	HDG	4″		HAVARD ROLL HANGER W/NON CONDUCTIVE
						PIPE ROLLER
10	4	CS	HDG	1/4″	x1″ x3″LG.	PLATE
11						



LOCATION PLAN

N

• PIPE ATTACH.

X STRUCT. ATTACH.

NOTES

HDG = HOT DIP GALVANIZED
SS = STAINLESS STEEL

JOB NO. 3449

PIPE LOAD & MOVEMENT DATA			
ANALYSIS NODE NO.	LATERAL	DOWN	AXIAL
LOAD (lb)		-350	
MOV'T (in)			
HYDRO. TEST LOAD:		DN.	

	PIPE SPECIFICATIONS	
2	PIPE SIZE	4″
	PIPE SCH.	
	TEMPERATURE	°F
	INSULATION	
	MATERIAL	CS
QUANTITY	LINE NO.	4″ G

REFERENCE DRAWINGS

PIPE SUPPORT DRAWING

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

PROJECT: BPS-1 JOB NO. : LB&A 093005

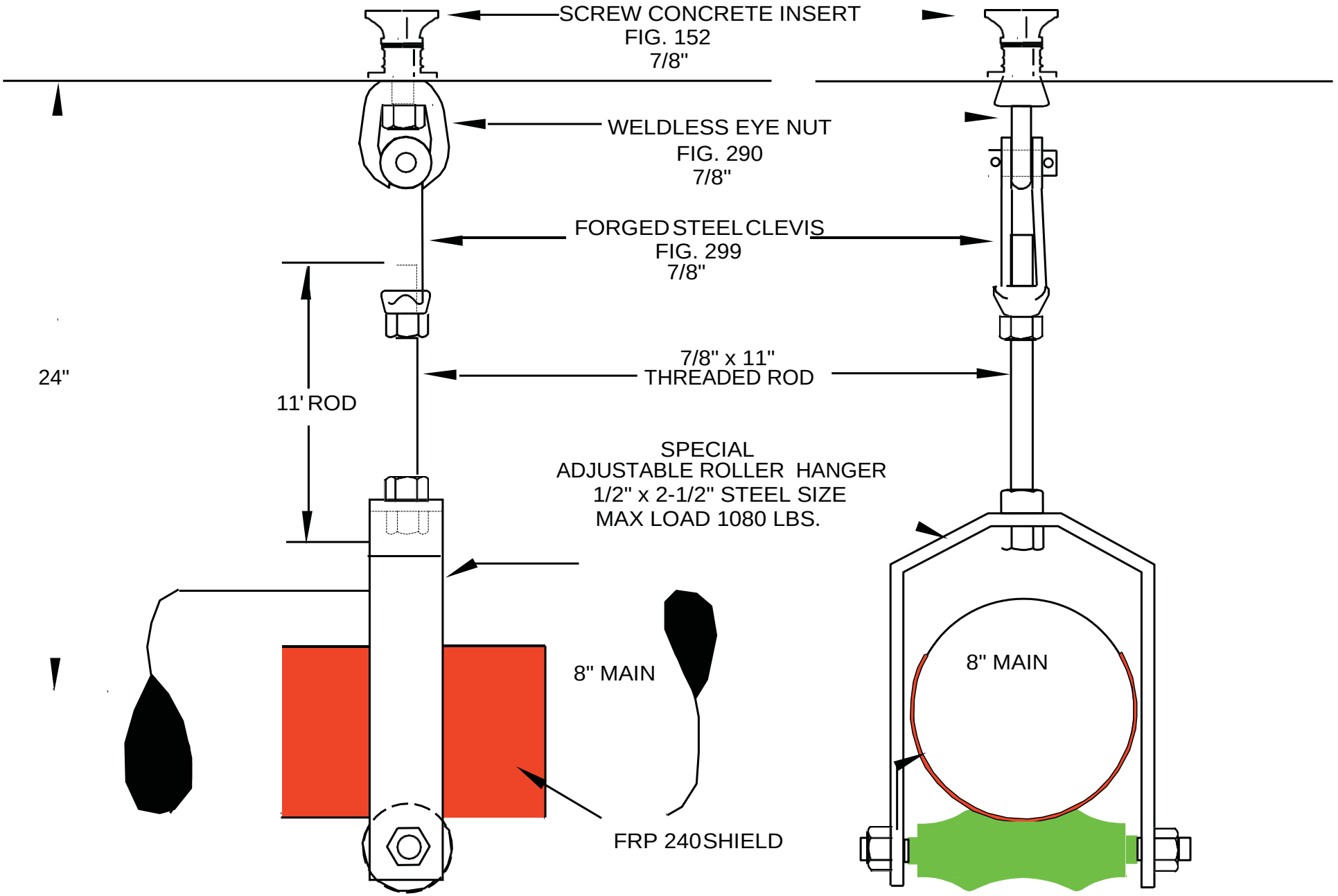
PIPING SYSTEM: GAS

CODE NO.: **BPS H1 12 08**

REV. 12/2008

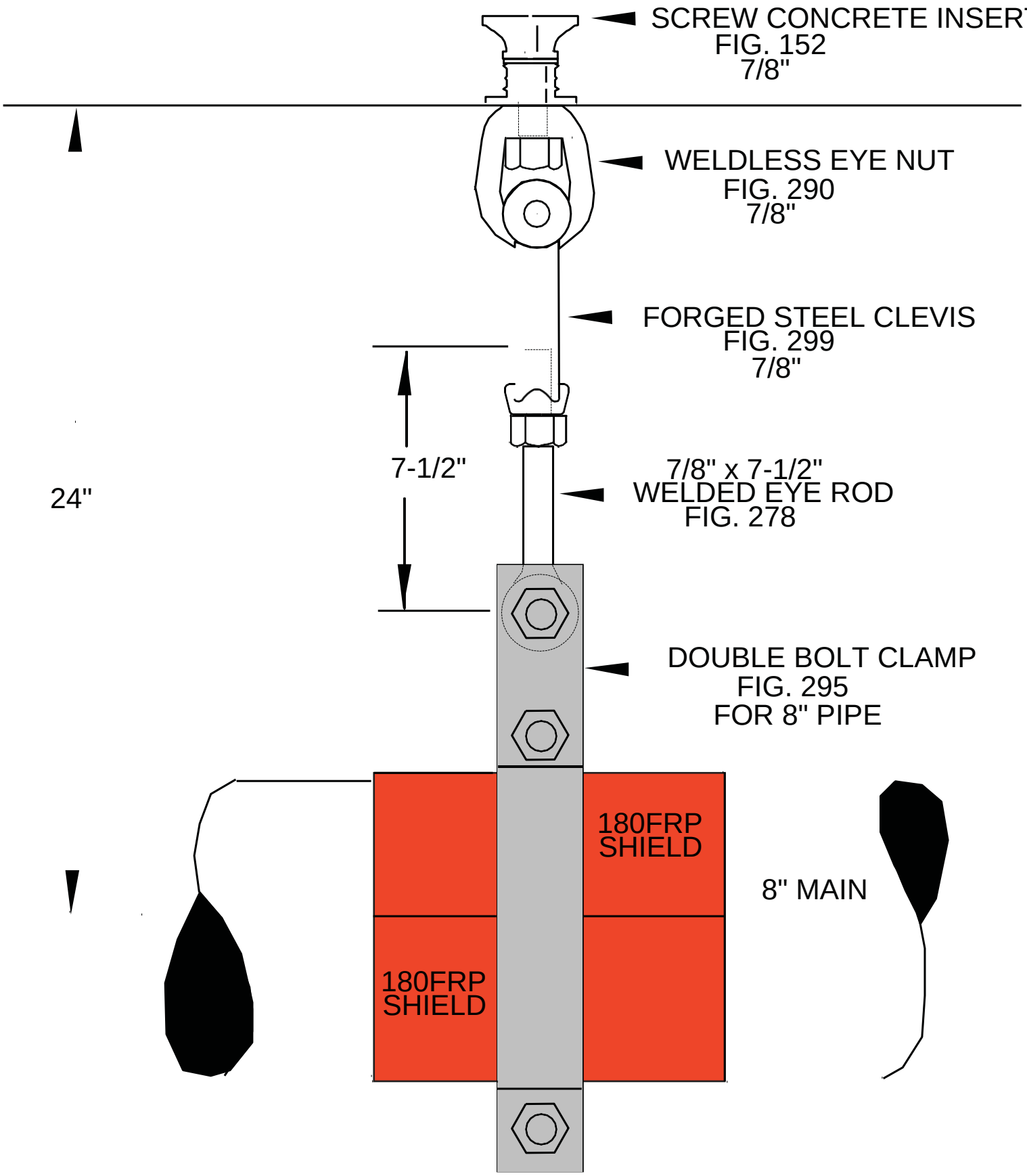
CONCRETE BRIDGE

CONCRETE BRIDGE

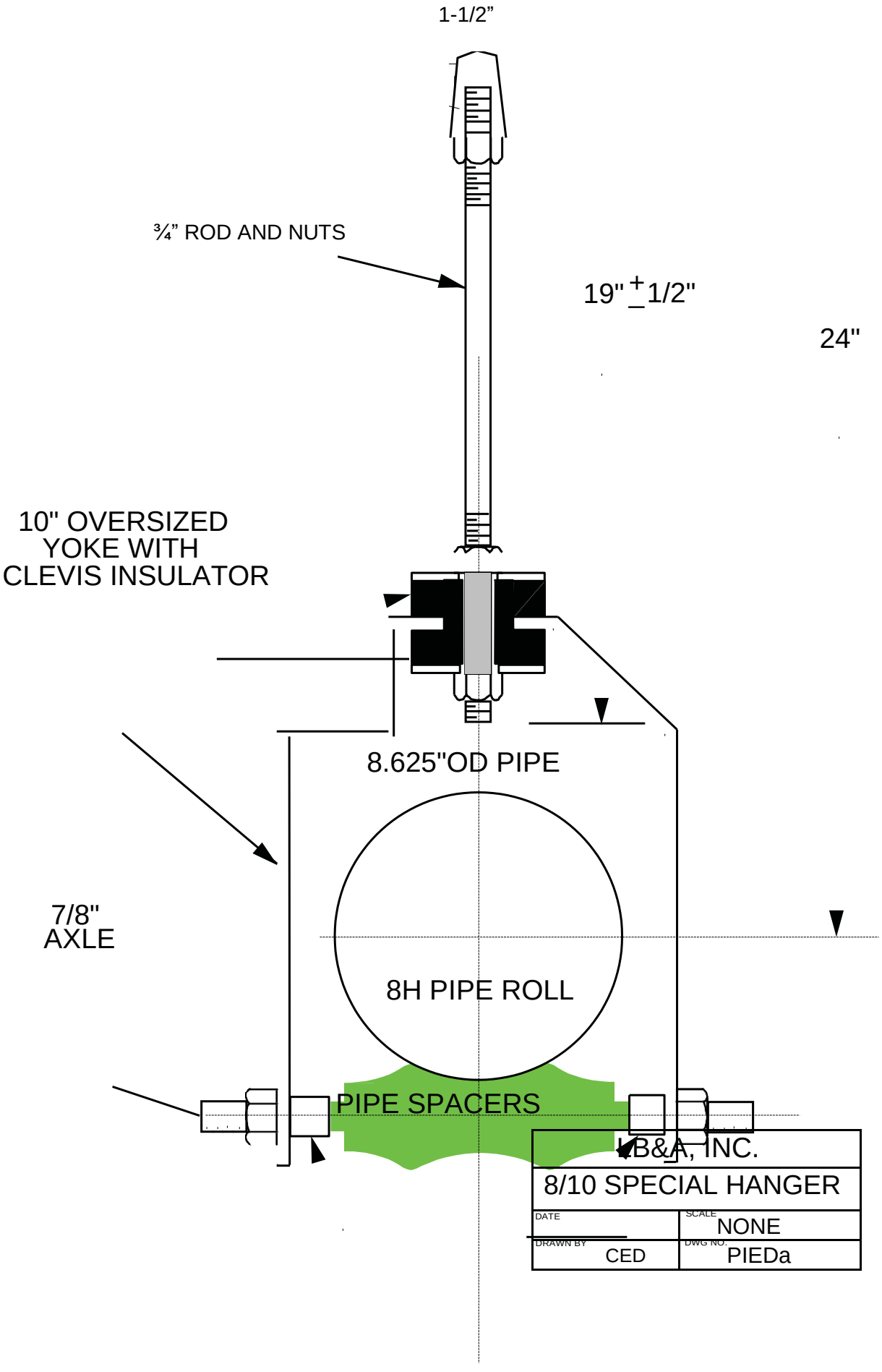


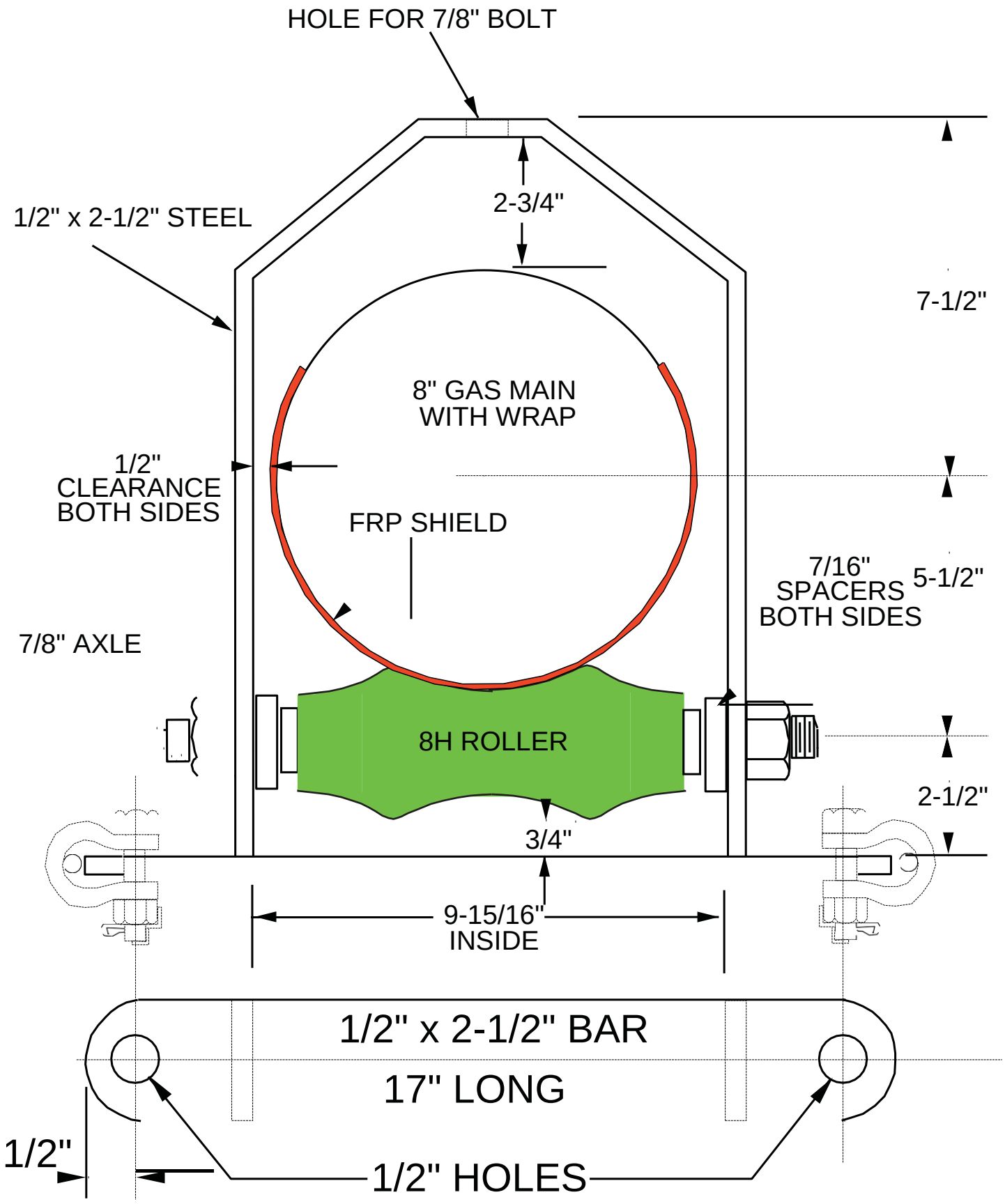
LB & A, INC.	
SPECIAL PIPE CLAMP	
DATE	SCALE NONE
DRAWN BY CED	DRAWING NO. EYECLP1a

CONCRETE BRIDGE



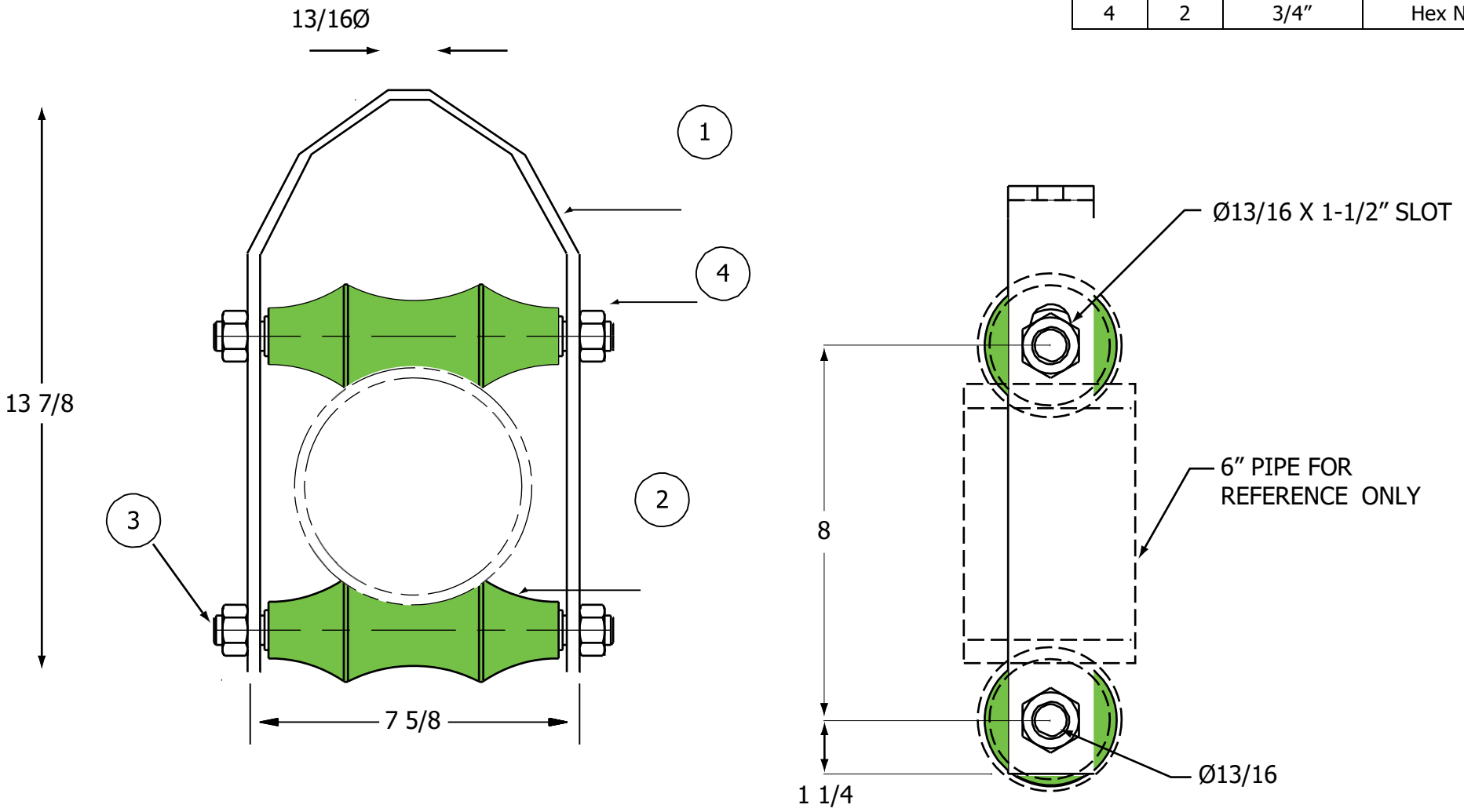
LB & A, INC.	
SPECIAL PIPE CLAMP	
DATE	SCALE: NONE
DRAWN BY: CED	DWG NO.: EYECLMPa


1-1/2”
¾” ROD AND NUTS
19" ± 1/2"
24"
10" OVERSIZED
YOKE WITH
CLEVIS INSULATOR
8.625"OD PIPE
7/8"
AXLE
8H PIPE ROLL
PIPE SPACERS
LB&A, INC.
8/10 SPECIAL HANGER
DATE
SCALE
NONE
DRAWN BY
CED
DWG NO.
PIEDa



LB&A, INC.	
SPECIAL PIPE ROLL HANGER	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. CABLE8Ca

Parts List			
ITEM	QTY	SIZE	DESCRIPTION
1	1	1/4" X 2"	Flat Bar
2	2	6"	Long Pattern Roll
3	2	3/4" X 8-1/2"	Hex Bolt
4	2	3/4"	Hex Nut



DESCRIPTION	FINISH	UNIT QTY.
250 - 6" ROLLER HANGER W/ (2) PIPE ROLLS	HDG	5

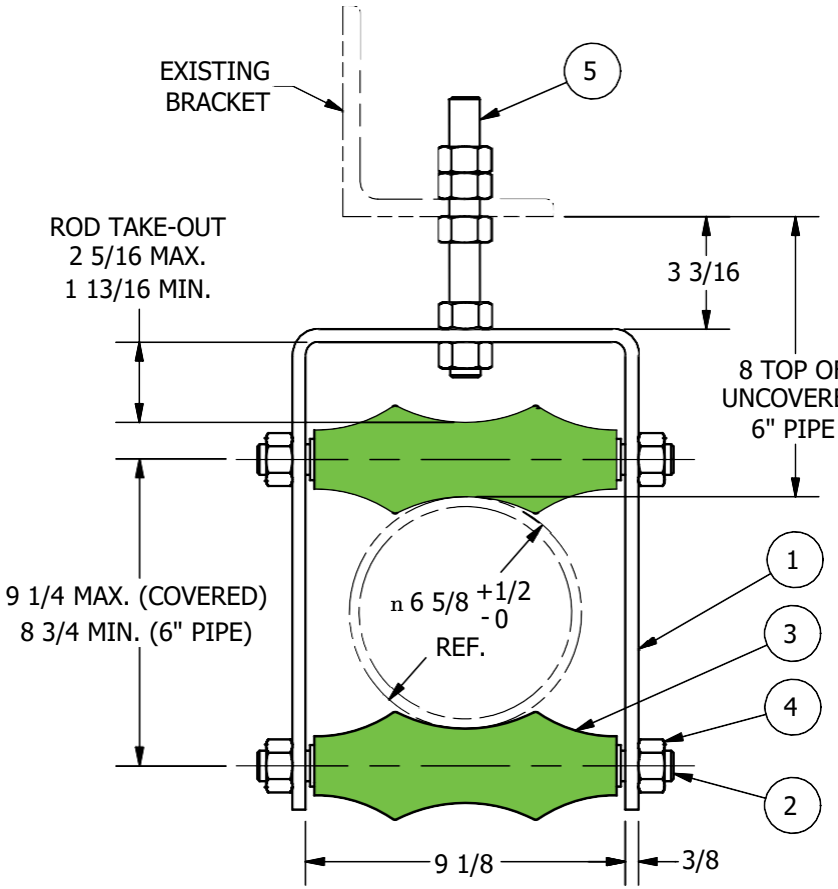
PROJECT

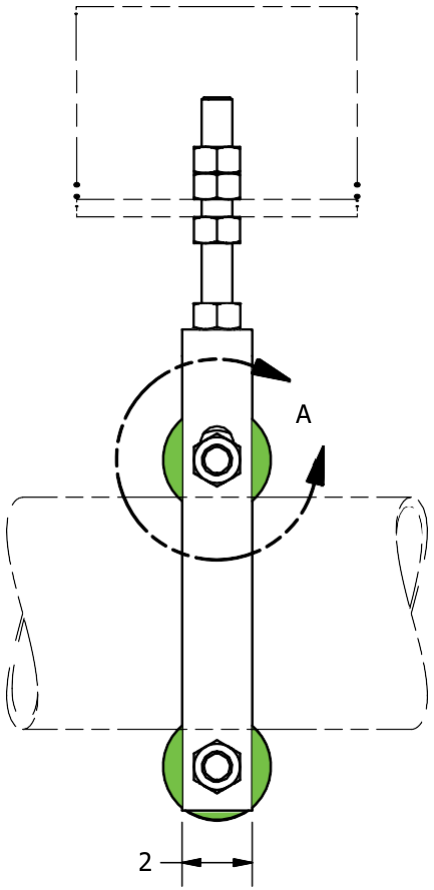
SCALE	ORDER NO.	DRAWING NO.	SHEET	REV.	TAG
5/16" = 1"	001467	2506D8_12_08	1 OF 1	0	

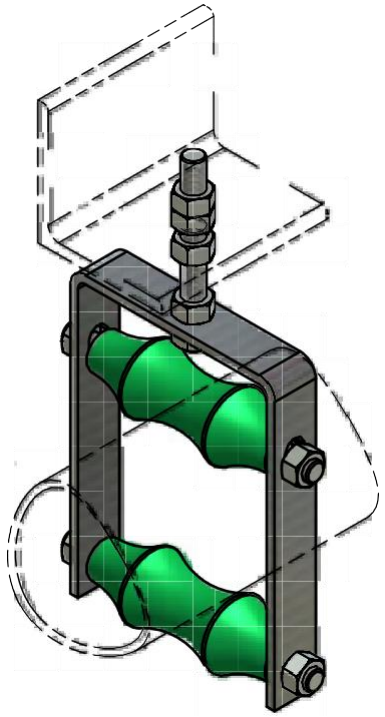
LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

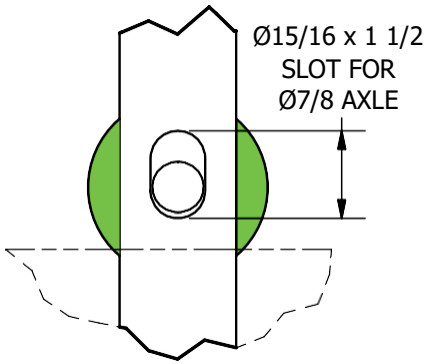
ITEM	QTY	PART NUMBER	DESCRIPTION	FINISH	LENGTH	WEIGHT EA.
1	1	BS-3016	FLAT STOCK, 3/8" x 2"	HDG	35 1/2 in	7.21
2	2	247G-0064	8" AXLE, 7/8" x 11-7/8"	EG	11 7/8 in	2.02
3	2	8H	NON-CONDUCTIVE PIPE ROLLER, 8"			1.57
4	9	785G-0007	REGULAR HEX NUT, 7/8"	EG		0.19
5	1	755G-0007	CONTINUOUS THREADED ROD, 7/8"	EG	8 in	1.36

NOTES:
1. SPECIAL ITEMS ARE NON-RETURNABLE.





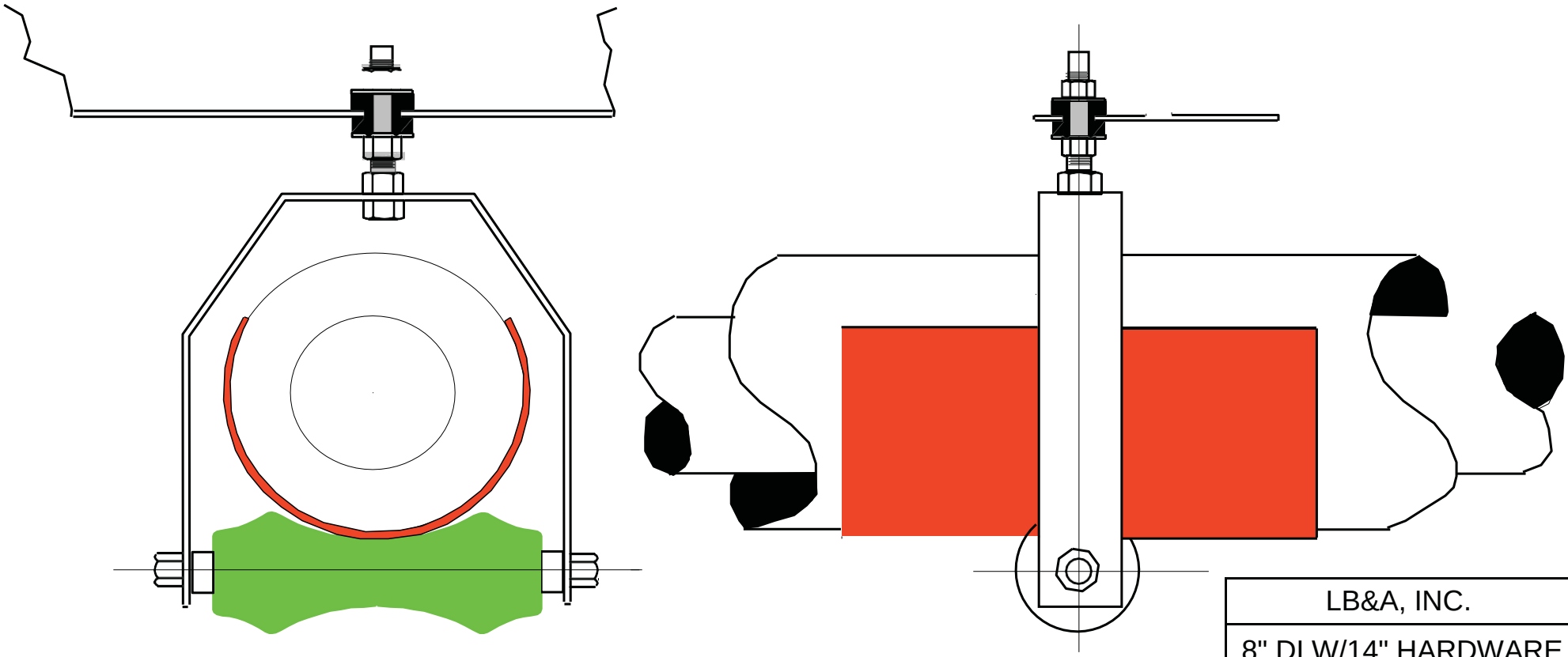




DETAIL A
SCALE 5 / 16

DESCRIPTION							FINISH	UNIT QTY.
SPECIAL - SINGLE ROD ROLLER HANGER W/ DOUBLE ROLLER							AS NOTED	47
CUSTOMER				PROJECT				
LINN BROWN & ASSOCIATES, INC.								
DRAWN BY	DUE DATE	SCALE	ORDER NO.	DRAWING NO.	SHEET	REV.	TAG	
JTOY		3/16" = 1"		250G-8-2R	1 OF 1	0		

LB&A, Inc

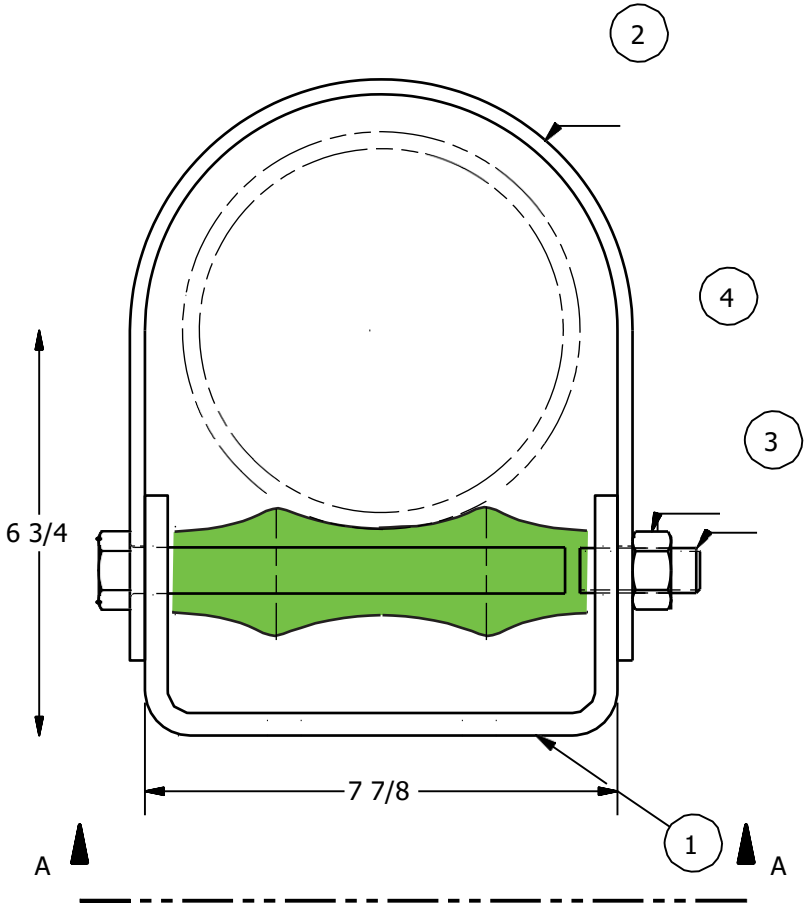


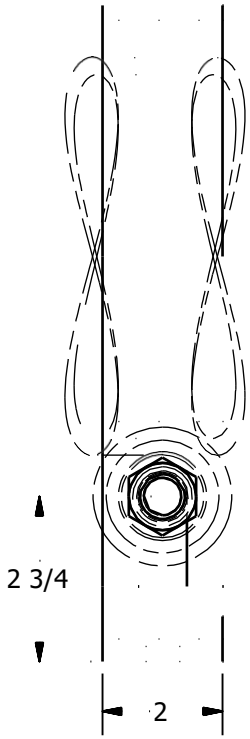
CLEVIS HANGER
W/ INSULATING BUSHING

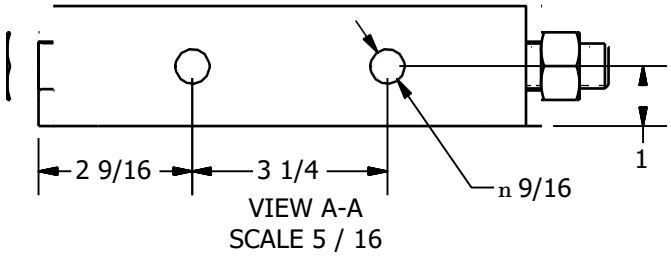
LB&A, INC.	
8" DI W/14" HARDWARE	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 1GARBB

SPECIAL ITEMS ARE NON-RETURNABLE

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	BSS-3016	FLAT BAR T304 3/8" X 2"
2	1	BSS-2016	FLAT BAR T304 1/4" X 2"
3	1	SPECIAL	3/4" HEX BOLT 18-8 SS
4	1	785S-0006	REGULAR HEX NUT, 3/4" 18-8 SS



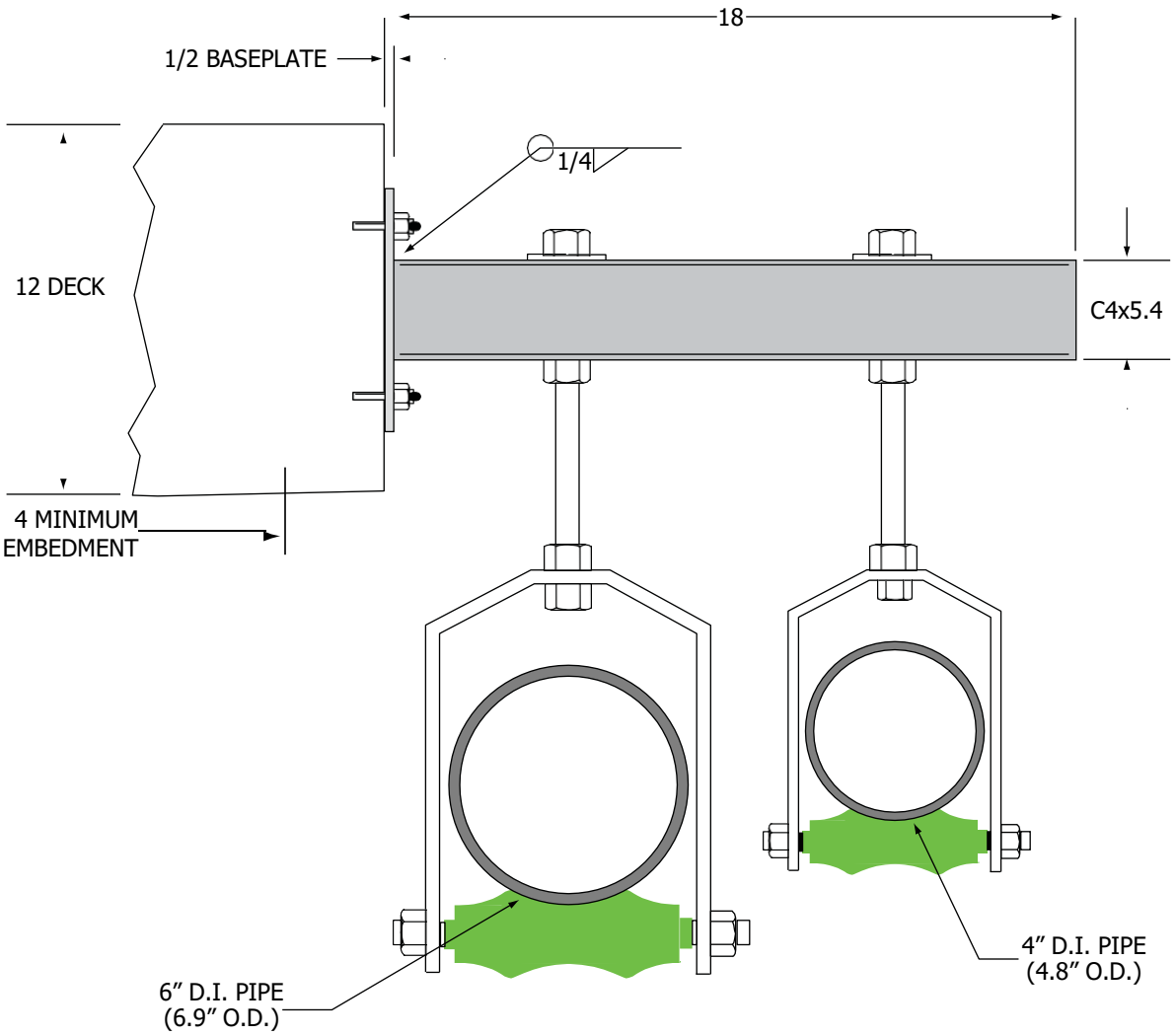


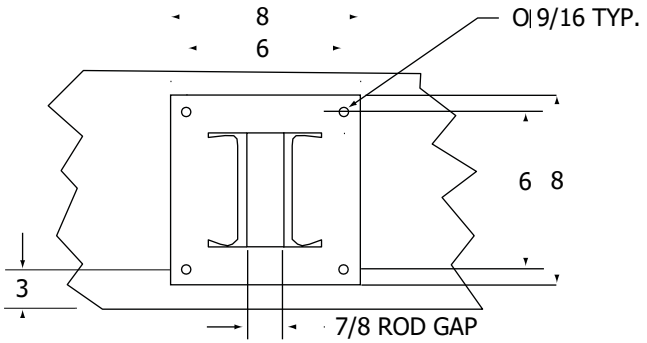


NOTE:
1) 6" PIPE & PIPE ROLL BY OTHERS

DESCRIPTION						FINISH	UNIT QTY.
245 - 6" ROLLER CHAIR W/ HOLD DOWN STRAP						304 SS	14
CUSTOMER			PROJECT				
LINN BROWN							
DRAWN BY	DATE	SCALE	ORDER NO.	DRAWING NO.	SHEET	REV.	TAG
AJM	3/12/2009		001830	245-6CHDS	1 OF 3	0	

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY



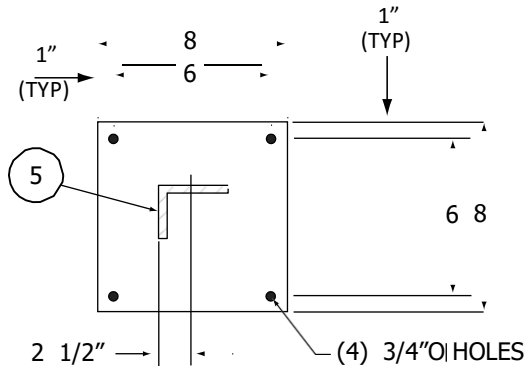


NOTES:

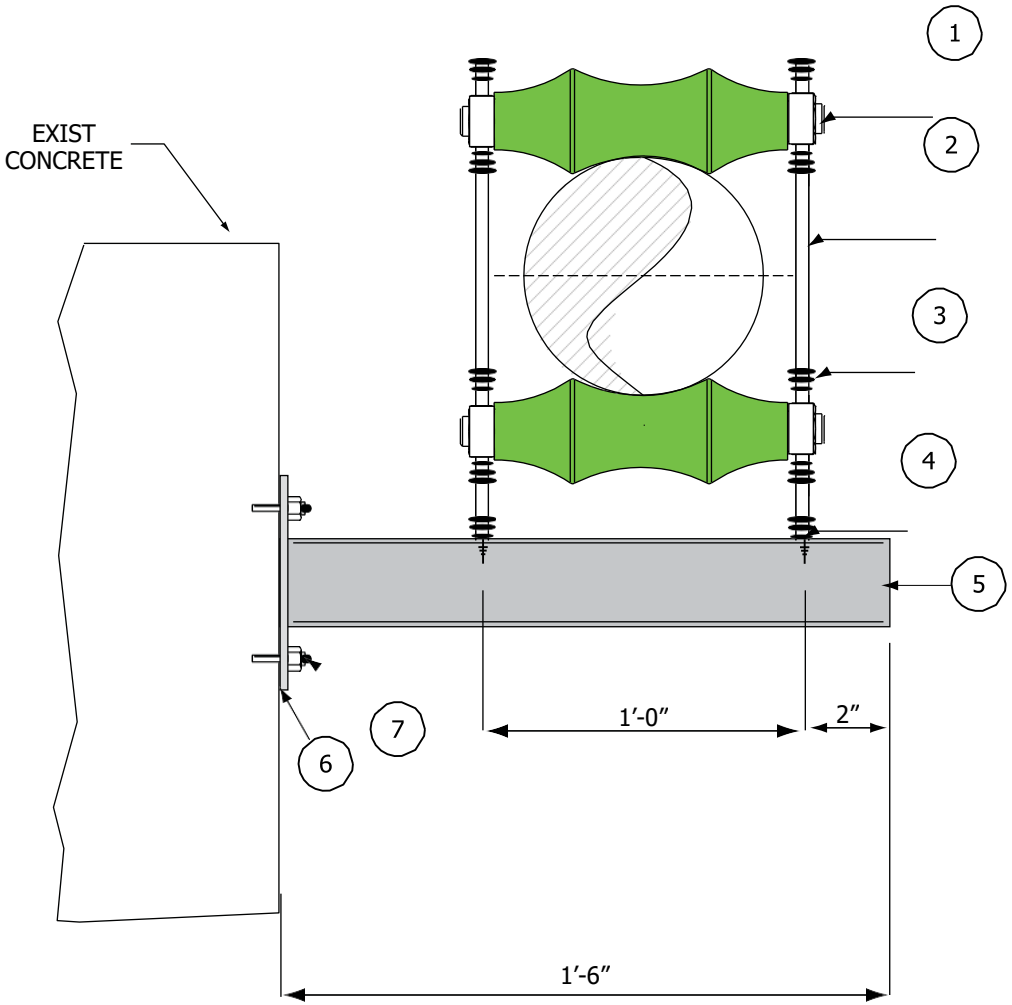
1. APPROXIMATE WEIGHT = 27 lbf.
2. 1/2" x 5 1/2" LONG WEDGE ANCHORS, EG.
3. MAXIMUM LOAD = 350 lbf.

SPECIAL ITEM DESCRIPTION				FINISH	REV.	TAG
PIPE SUPPORT BEAM				HDG	UNIT QTY. 2	
		PROJECT				
	SCALE 1/8" = 1"	ORDER NO.	DRAWING NO. PBS_12_08	SHEET 1 OF 1	0	

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY



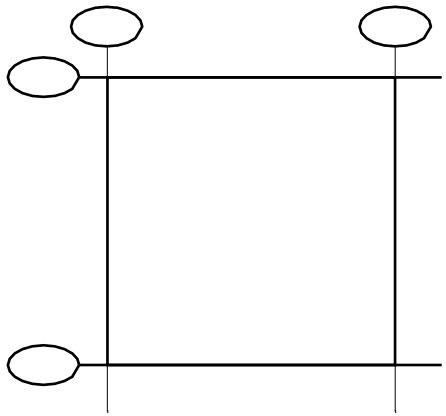
DETAIL ITEM NO.6



NOT TO SCALE

ELEVATION VIEW

ITEM	QTY	FIGURE NO.	FIN.	SIZE	LENGTH	MATERIAL DESCRIPTION
1	2	142	HDG	8"		ADJUSTABLE ROLL SUPPORT
2	2	94	SS	7/8"o	x2' -0"LG.	A.T. ROD (FIELD CUT TO SUIT)
3	24	165H	SS	7/8"		HEAVY HEX NUT
4	4	103	SS	7/8"		ROUND WASHER
5	1	CS	HDG	L4 x4	x3/8 x1'-5 1/2"LG.	ANGLE W/(2) 15/16"x 1 1/2" LG.
						SLOTTED HOLE
6	1	CS	HDG	1/2"	x 8' x0'-8'LG.	PLATE W/(4) 3/4" o HOLE
7	4	1309	SS	5/8" o	x7"LG.	WEDGE ANCHOR (MIN. EMB=3 3/4")
8						
9						
10						
11						



LOCATION PLAN

NOTES

SS = STAINLESS STEEL TYPE 304
HDG = HOT DIP GALVANIZED

JOB NO. 3524

PIPE LOAD & MOVEMENT DATA			
ANALYSIS NODE NO.	LATERAL	DOWN	AXIAL
LOAD (lb)		-1400	
MOV'T (in)			
HYDRO. TEST LOAD:		DN.	

PIPE SPECIFICATIONS	
PIPE SIZE	8"
PIPE SCH.	
TEMPERATURE	°F
INSULATION	
MATERIAL	CS
LINE NO.	8" G

QUANTITY

REFERENCE DRAWINGS

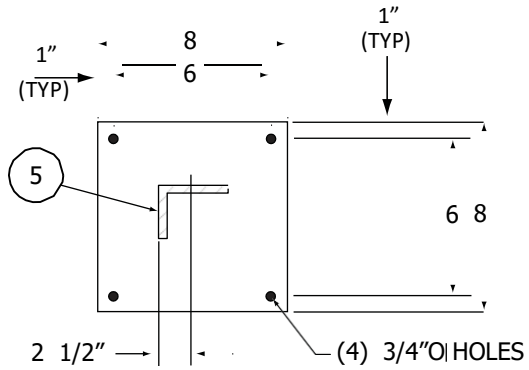
1)_____ 3) _____

2)_____ 4) _____

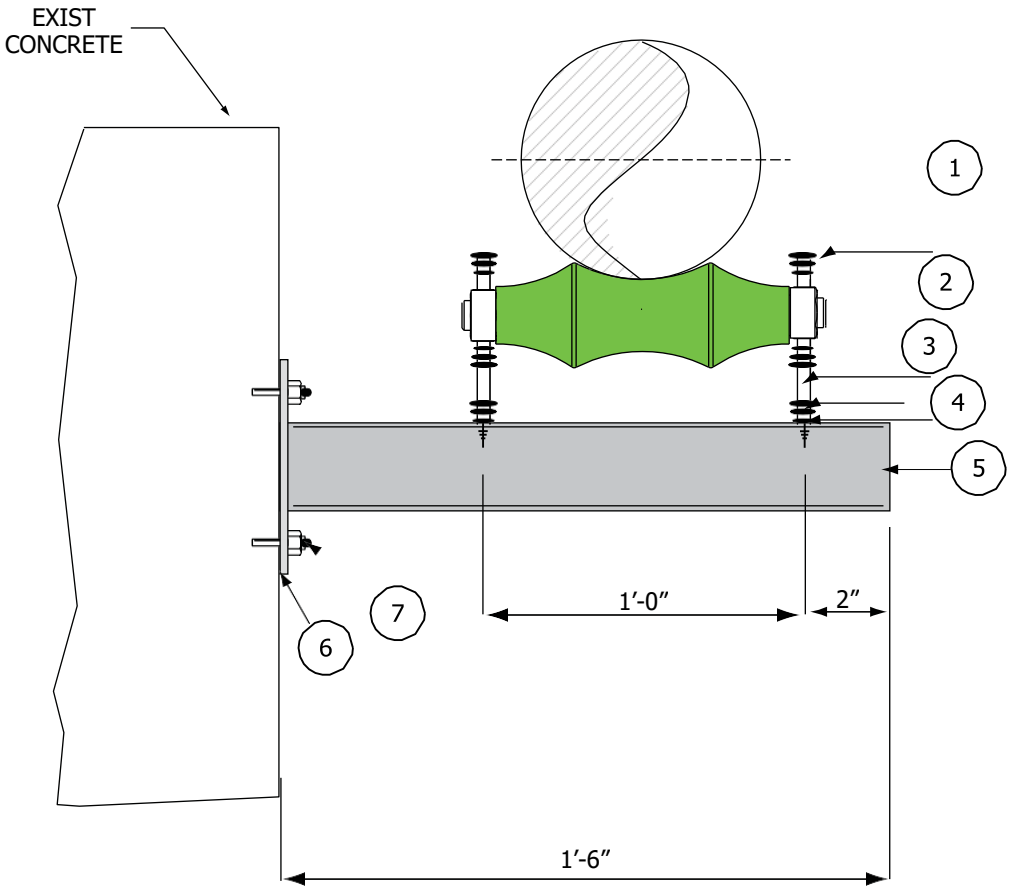
PIPE SUPPORT DRAWING

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

PIPING SYSTEM	GAS	
CODE NO.	**DINO6_02_12_08**	REV. 12/2008



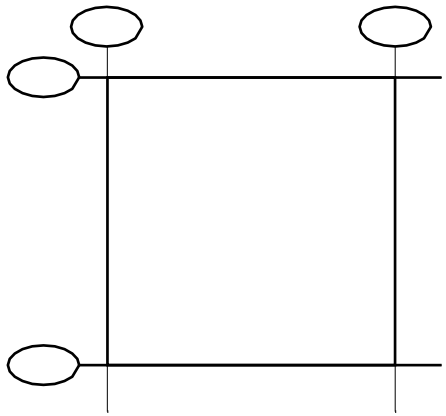
DETAIL ITEM NO.6



NOT TO SCALE

ELEVATION VIEW

ITEM	QTY	FIGURE NO.	FIN.	SIZE	LENGTH	MATERIAL DESCRIPTION
1	1	142	HDG	8"		ADJUSTABLE ROLL SUPPORT
2	2	94	SS	7/8"Ø	x1' -0"LG.	A.T. ROD (FIELD CUT TO SUIT)
3	16	165H	SS	7/8"		HEAVY HEX NUT
4	4	103	SS	7/8"		ROUND WASHER
5	1	CS	HDG	L4 x4	x3/8 x)'-5 1/2"LG.	ANGLE W/(2) 15/16"x 1 1/2" LG.
						SLOTTED HOLE
6	1	CS	HDG	1/2"	x 8' x0'-8'LG.	PLATE W/(4) 3/4" ØHOLE
7	4	1309	SS	5/8" Ø	x7"LG.	WEDGE ANCHOR (MIN. EMB=3 3/4")
8						
9						
10						
11						



LOCATION PLAN

• PIPE ATTACH.

X STRUCT. ATTACH.

NOTES

SS = STAINLESS STEEL TYPE 304
HDG = HOT DIP GALVANIZED

JOB NO. 3524

PIPE LOAD & MOVEMENT DATA			
ANALYSIS NODE NO.	LATERAL	DOWN	AXIAL
LOAD (lb)		-1400	
MOV'T (in)			
HYDRO. TEST LOAD:		DN.	

PIPE SPECIFICATIONS	
PIPE SIZE	8"
PIPE SCH.	
TEMPERATURE	°F
INSULATION	
MATERIAL	CS
LINE NO.	8" G

QUANTITY

REFERENCE DRAWINGS

1)_____ 3) _____

2)_____ 4) _____

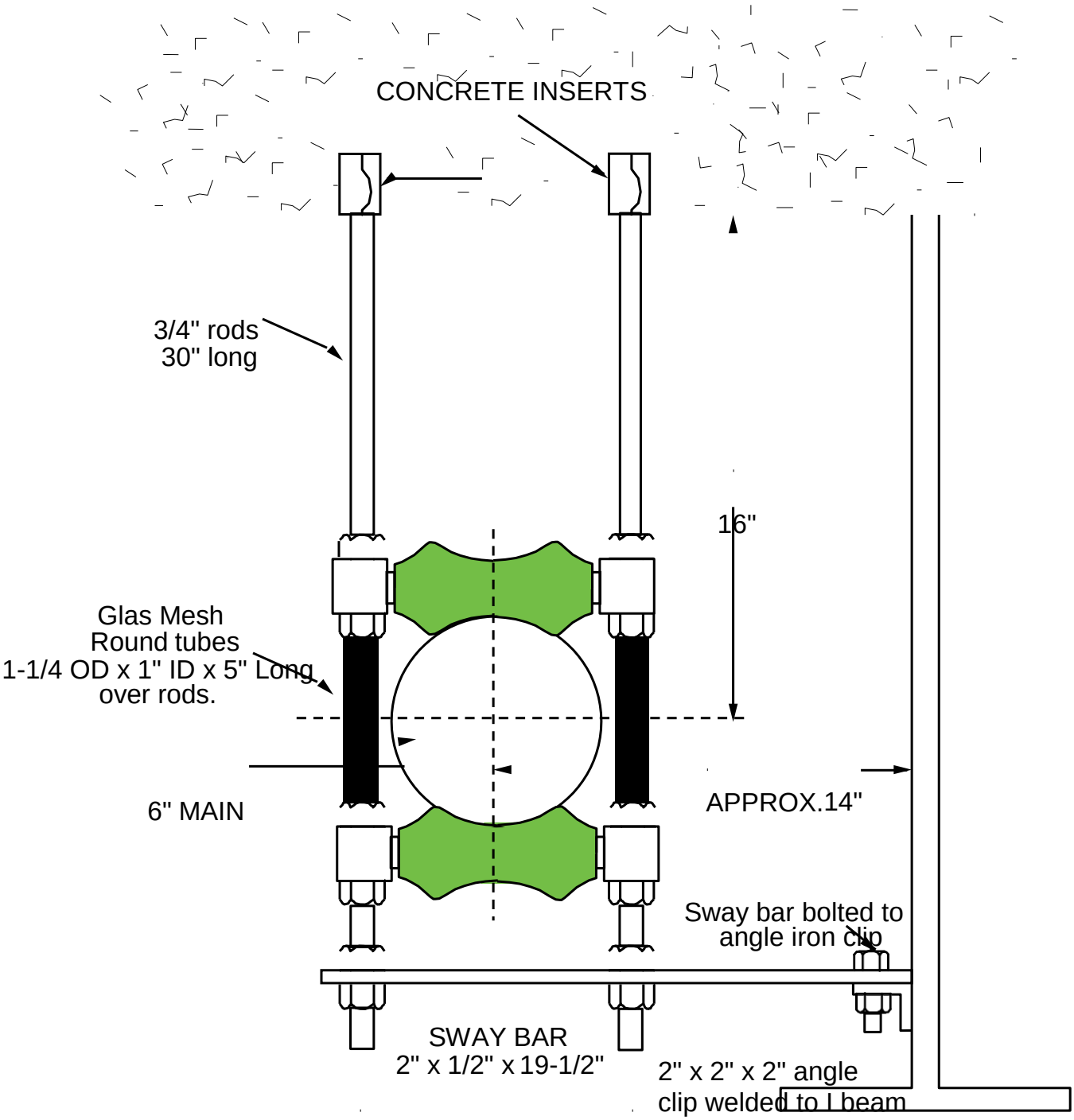
PIPE SUPPORT DRAWING

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

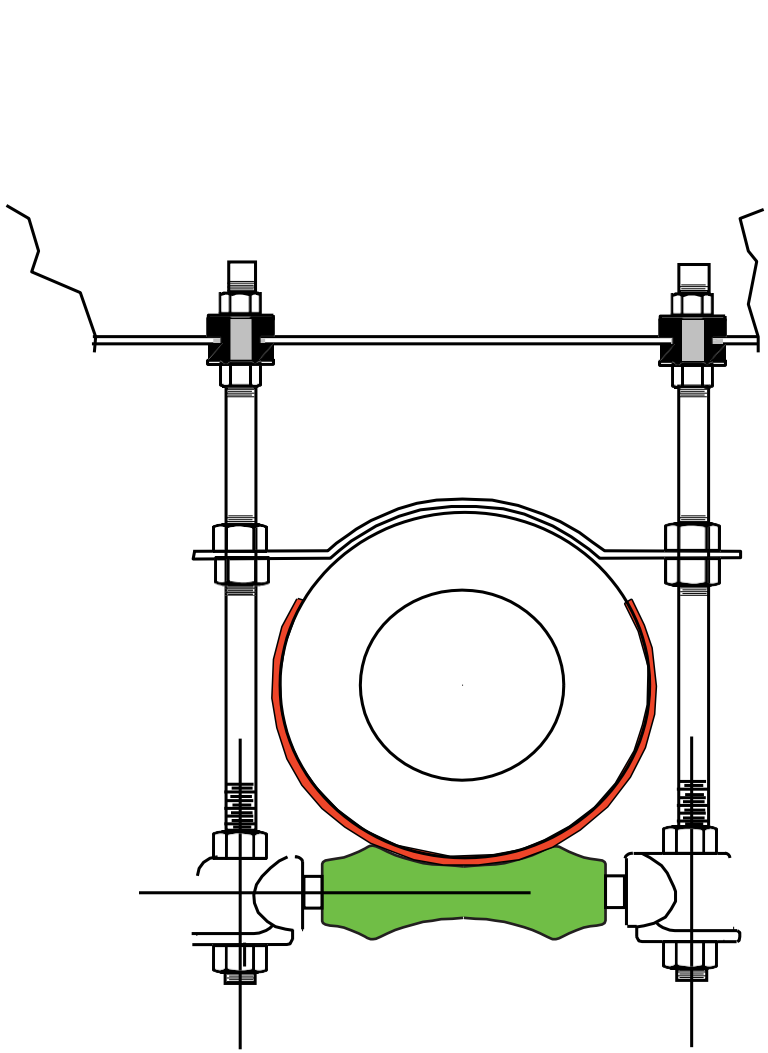
PIPING SYSTEM: GAS

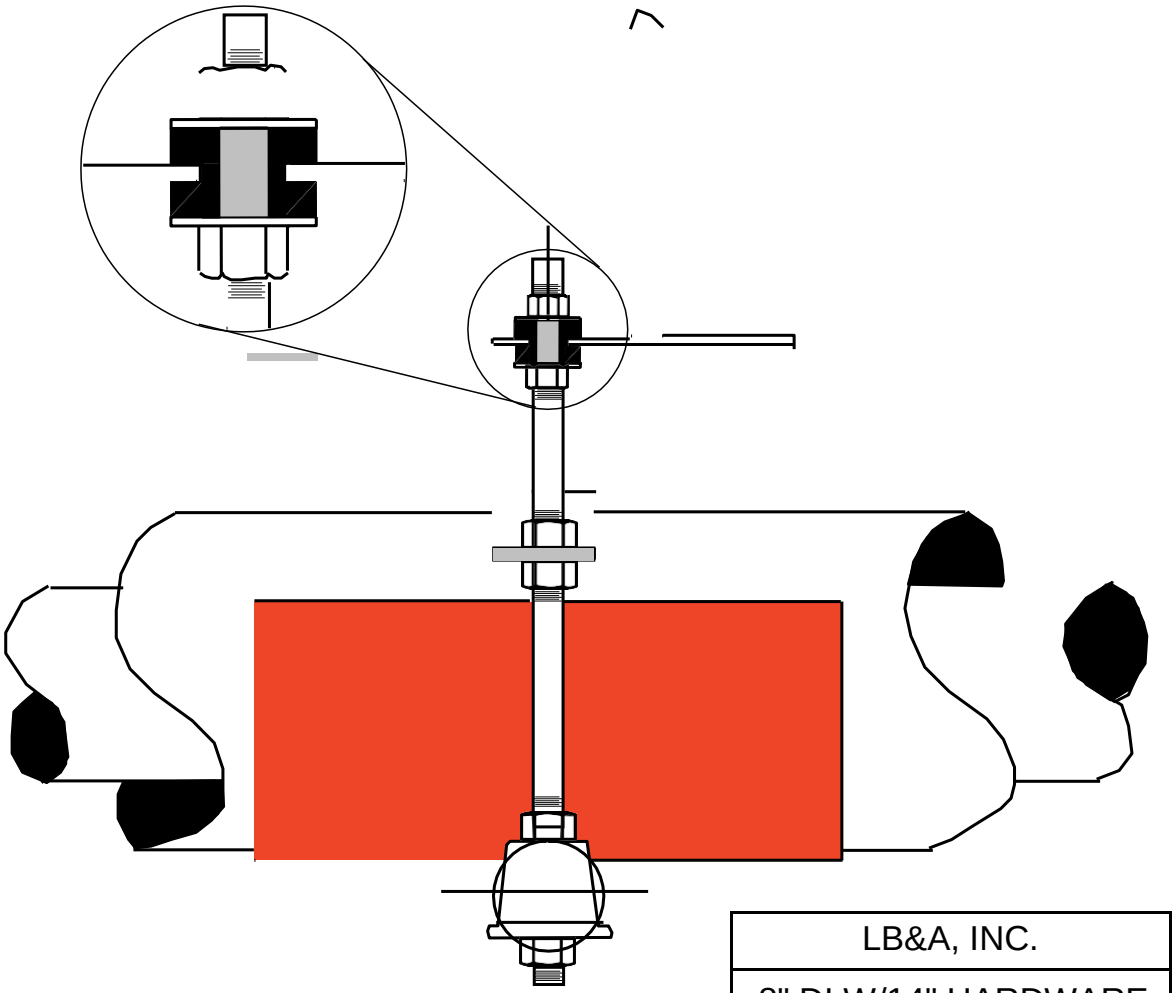
CODE NO.: **DINO6_12_08**

REV. 12/2008



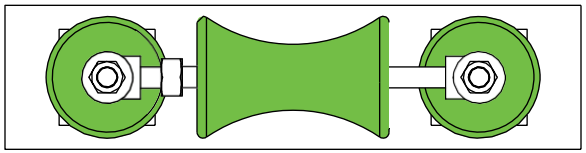
LB&A, INC	
SPECIAL 6" GUIDE	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. ASP6RLa

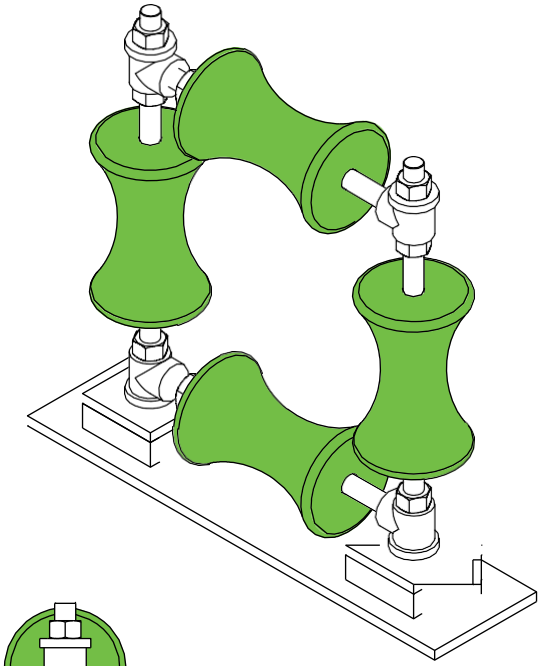


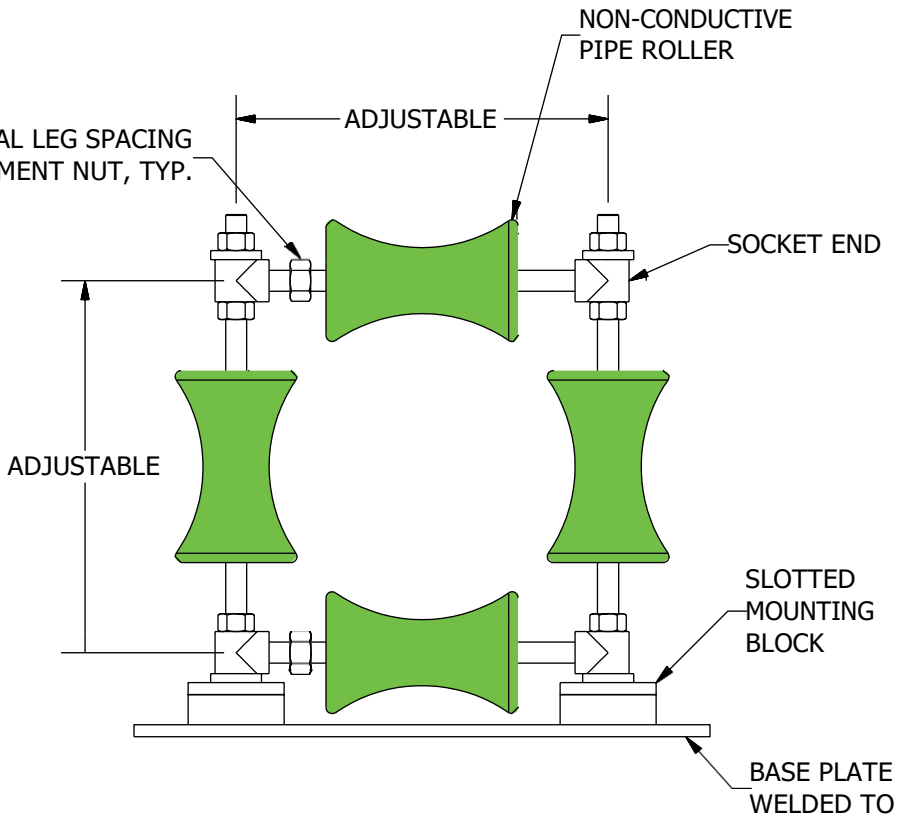


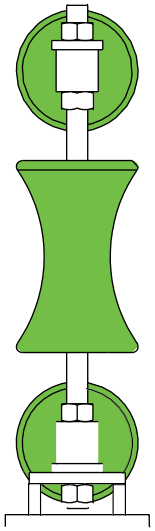
SINGLE PIPE ROLL W/ STRAP
W/ INSULATING BUSHINGS

LB&A, INC.	
8" DI W/14" HARDWARE	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 1GARBA



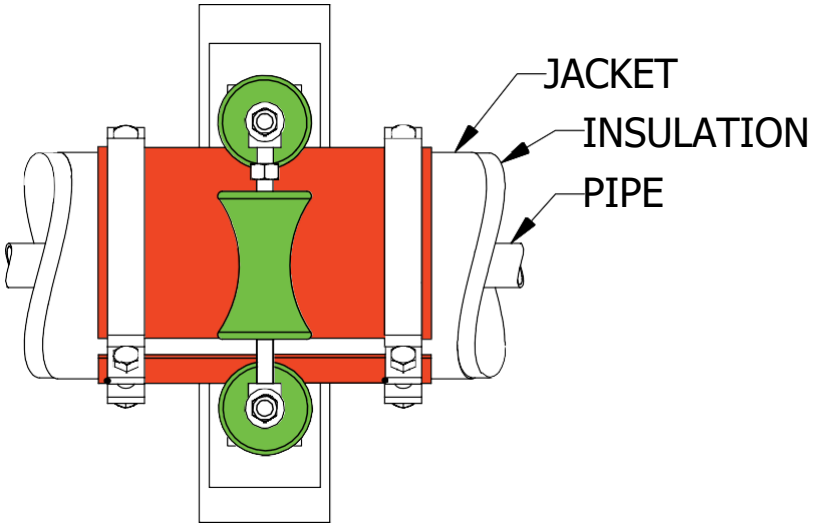


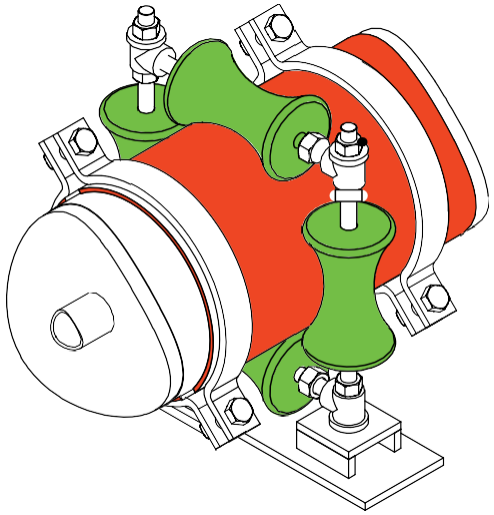


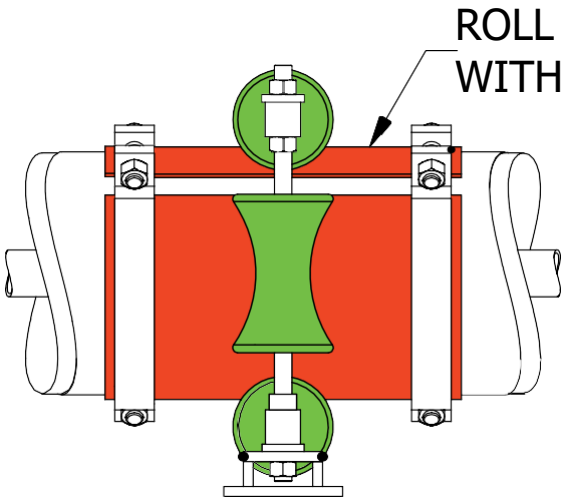


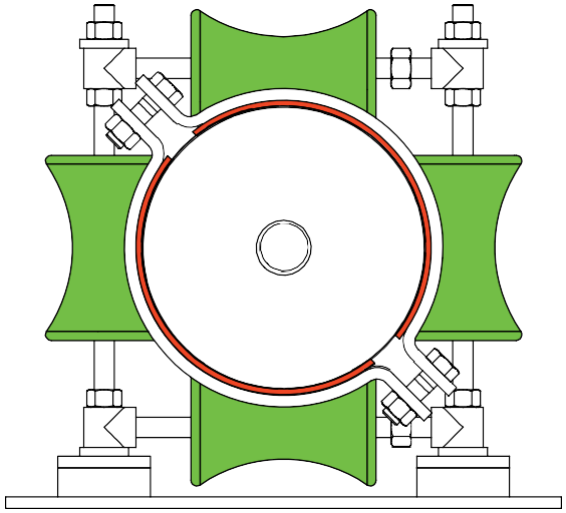
DESCRIPTION ROLLER GUIDE								
LINN BROWN ASSOCIATES, INC.					ROLLER GUIDE DESIGN			
DRAWN BY JTOY	DATE	CHECKED BY GR	SCALE 1/8" = 1"	ORDER NO.	DRAWING. NO. RGD-1	SHEET 1 OF 2	REV. 0	TAG

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY



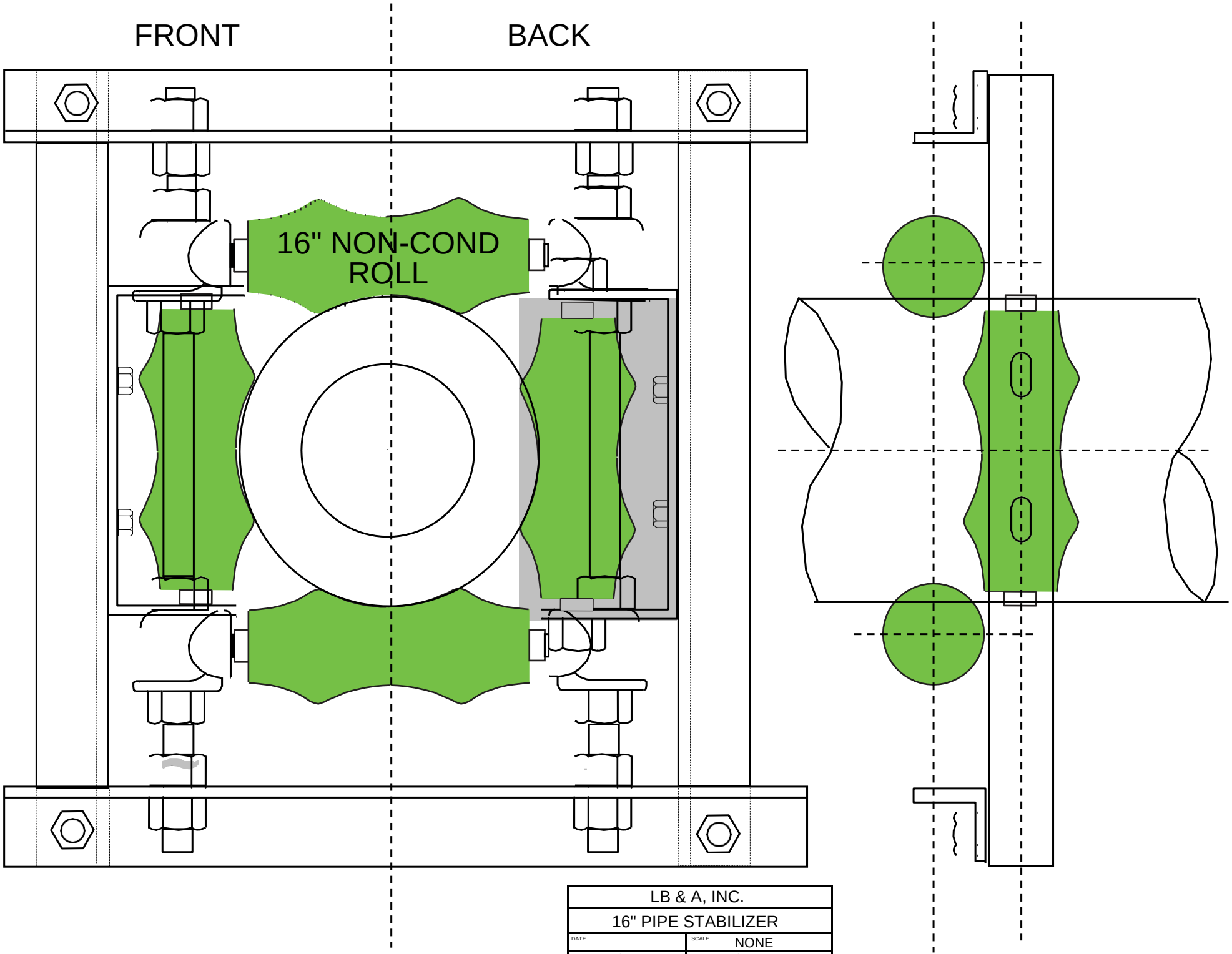




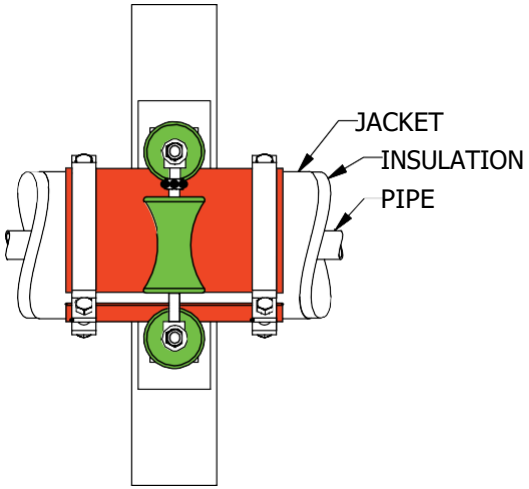


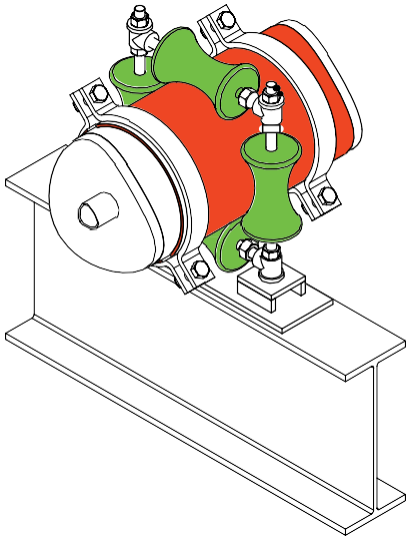
DESCRIPTION ROLLER GUIDE WITH PIPE								FINISH UNIT QTY.
LINN BROWN ASSOCIATES, INC.					ROLLER GUIDE DESIGN			
DRAWN BY JTOY	DATE	CHECKED BY GR	SCALE 1/8" = 1"	ORDER NO.	DRAWING. NO. RGD-1b	SHEET 2 OF 2	REV. 0	TAG

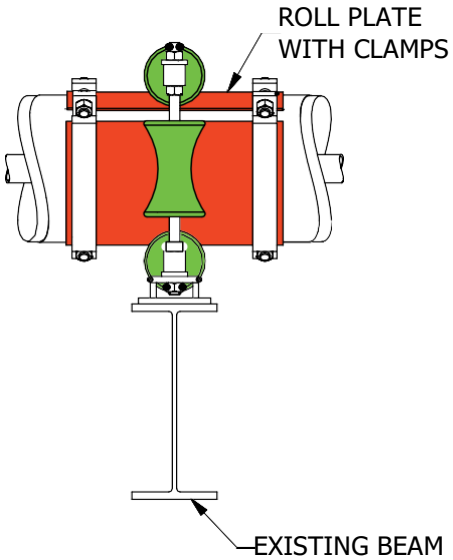
LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

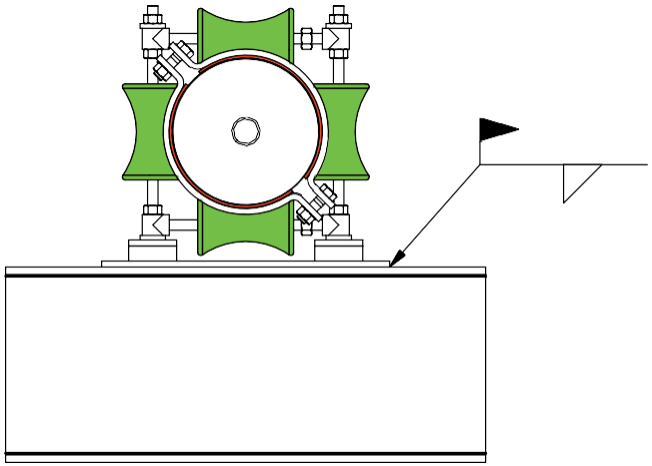


LB & A, INC.	
16" PIPE STABILIZER	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 3BMILa



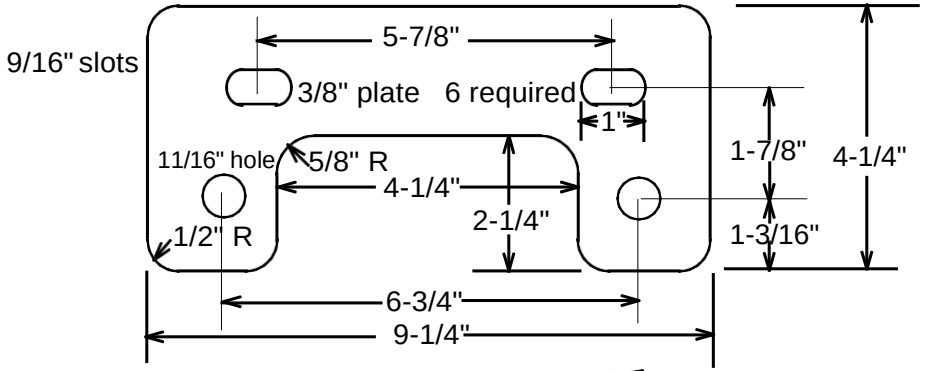


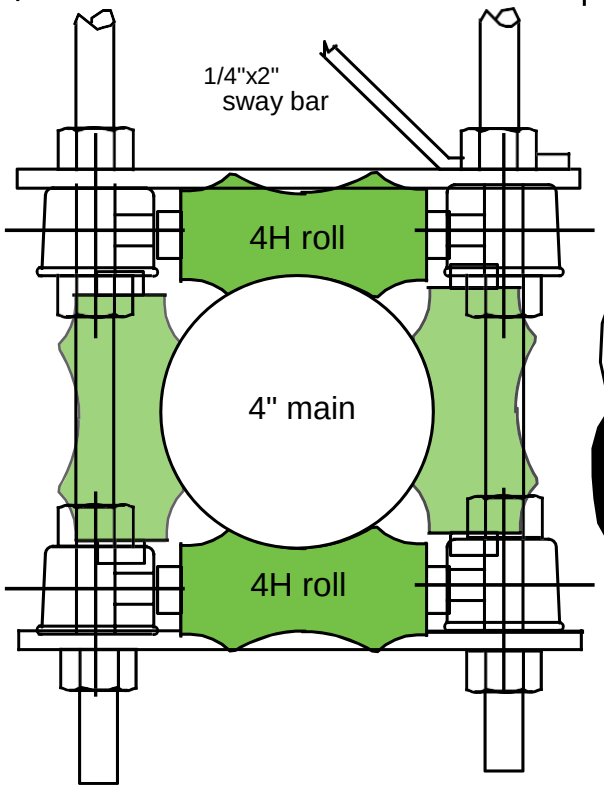


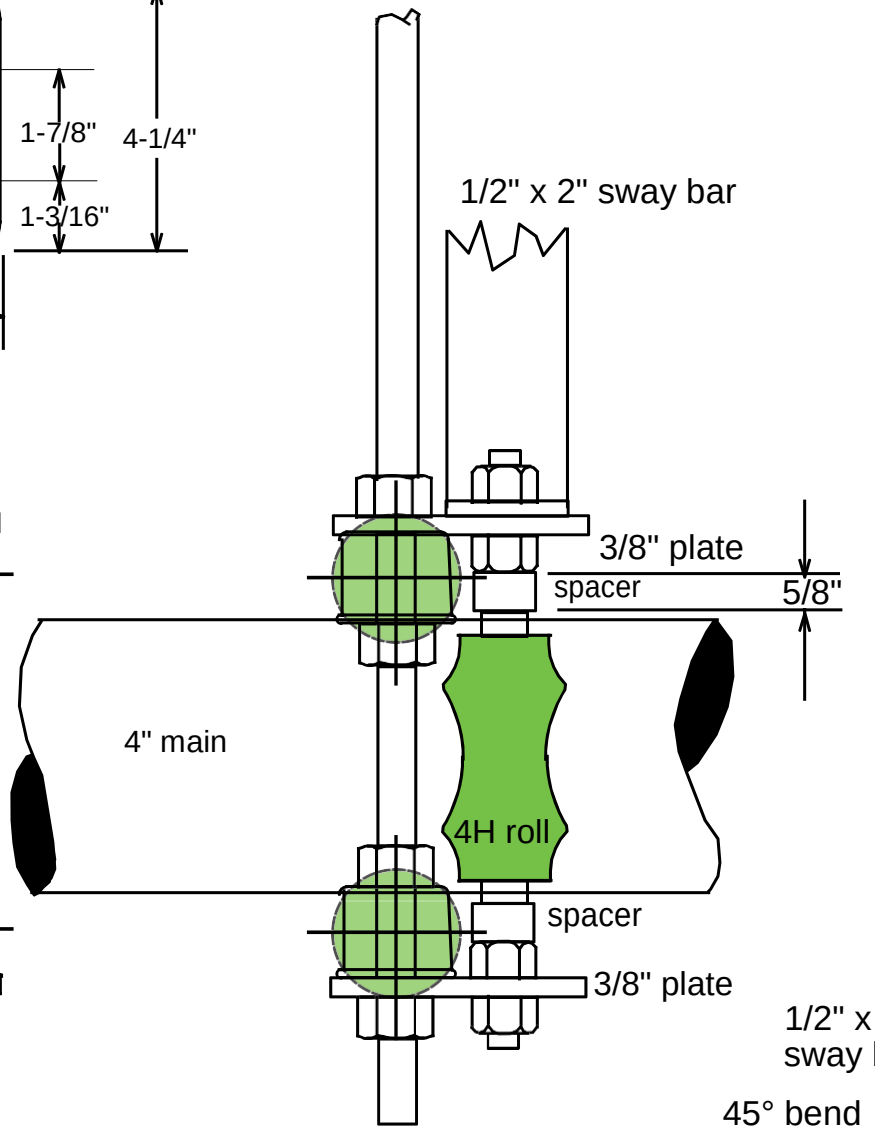


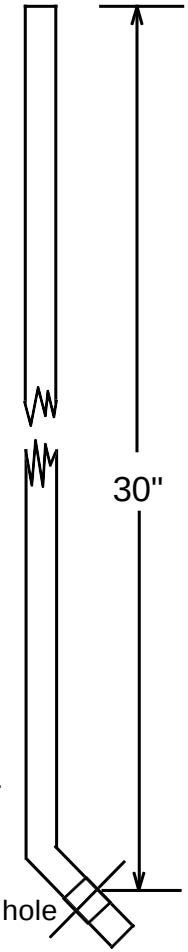
DESCRIPTION ROLLER GUIDE WITH PIPE								FINISH UNIT QTY.
LINN BROWN ASSOCIATES, INC.					ROLLER GUIDE DESIGN			
DRAWN BY JTOY	DATE	CHECKED BY GR	SCALE 1/8" = 1"	ORDER NO.	DRAWING. NO. RGD-1a	SHEET 2 OF 2	REV. 0	TAG

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY









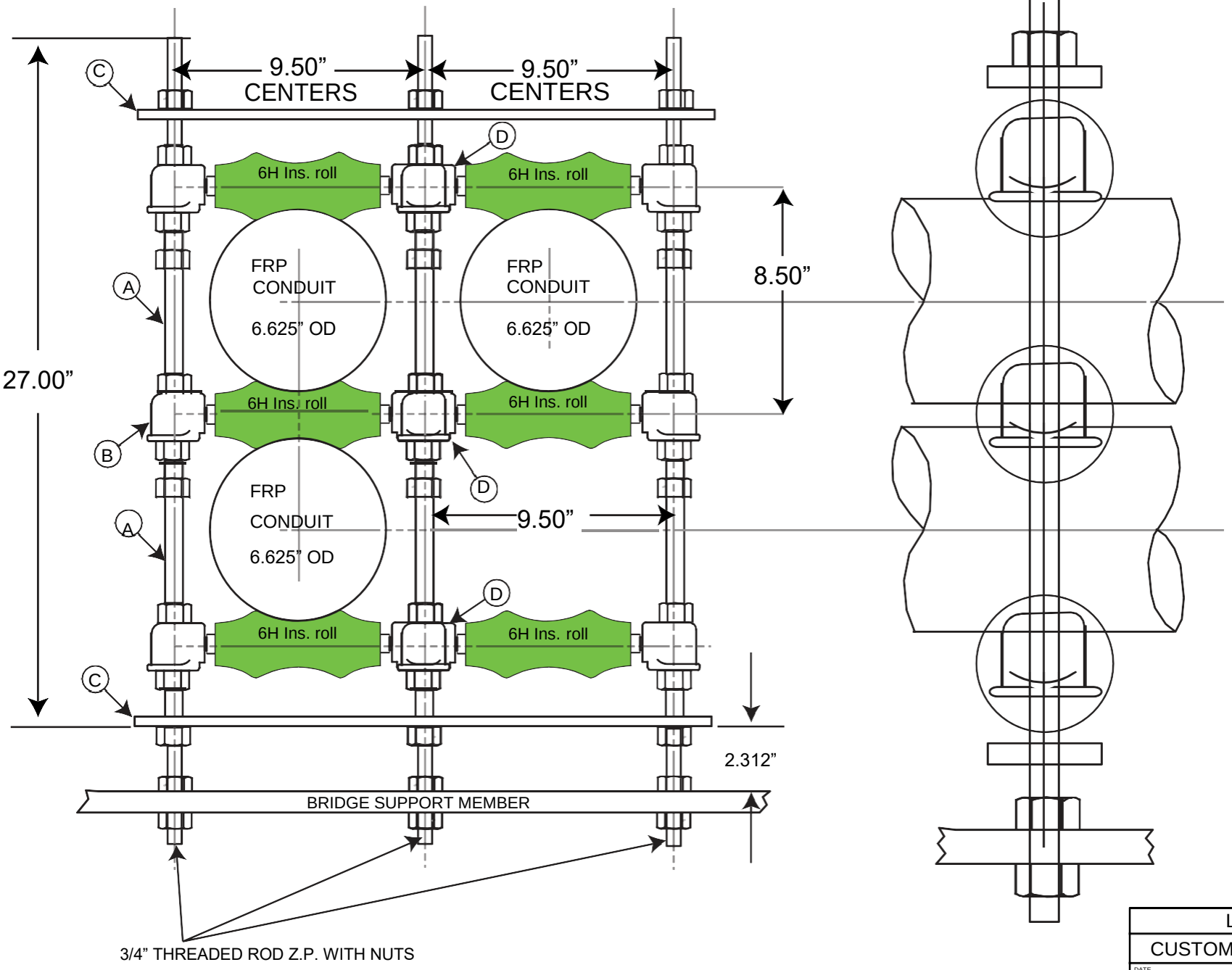
LB & A, INC.	
SPECIAL 4" STABILIZER	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 4STABLa

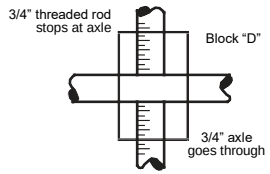
PROPOSED HANGER

NOTE:
other end of sway bar
will be bent & drilled in field

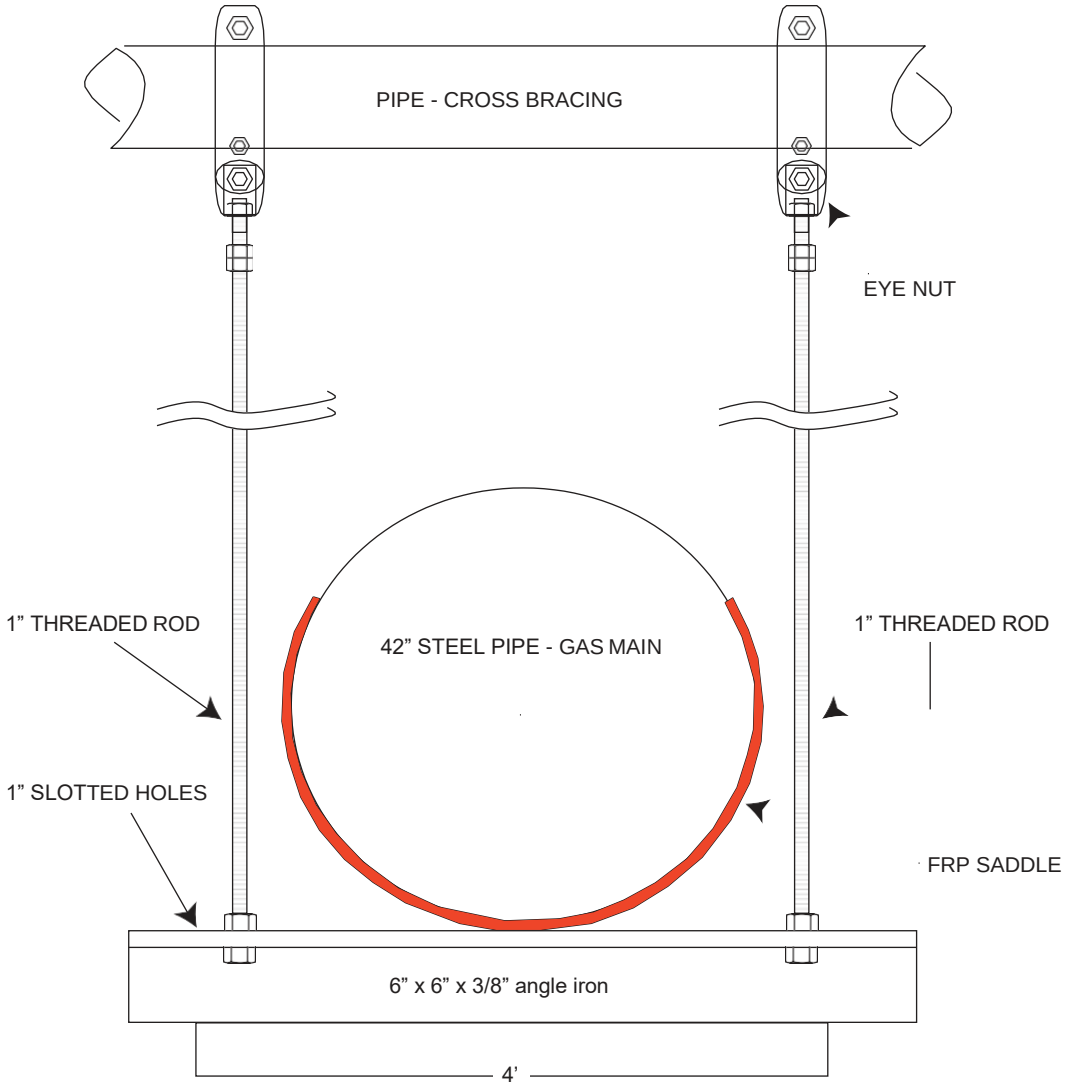
NOTE: Axles pass through the steel blocks “D”, the center rods are cut into sections and threaded into the steel blocks.

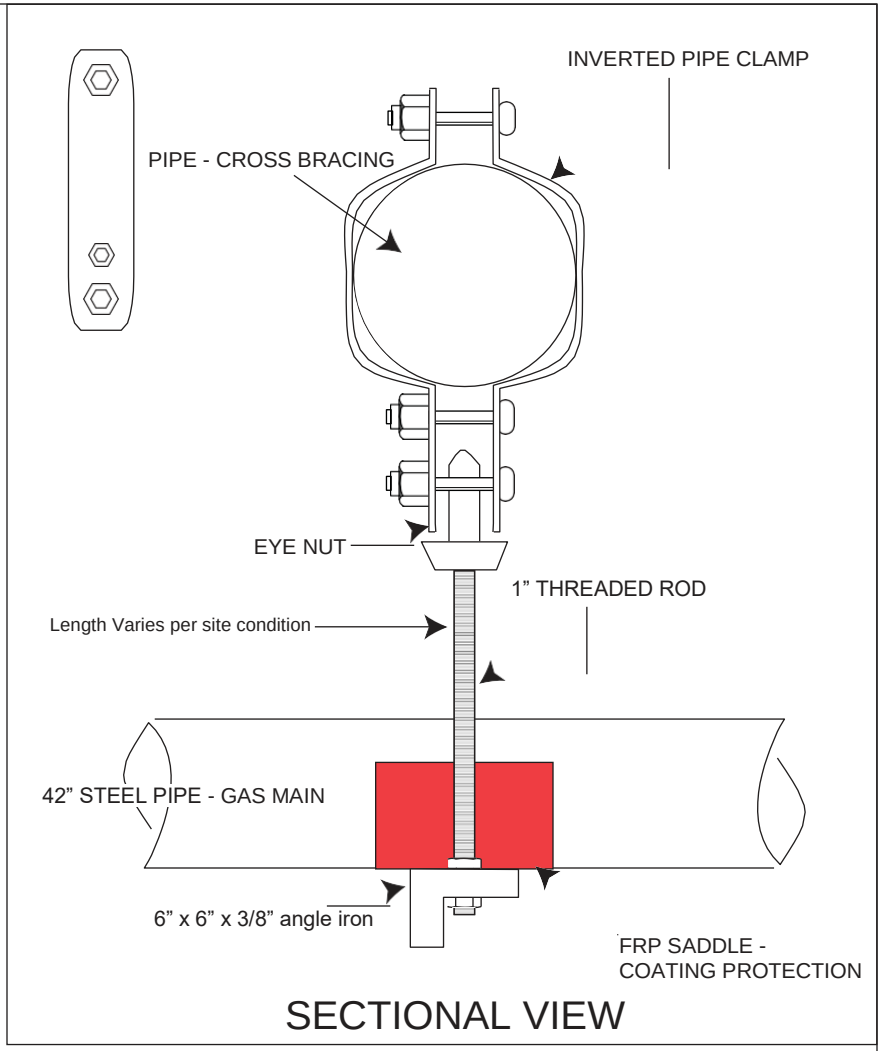
A - FRP round tube 1” OD x 1/8” wall x 6.25” L
B - #4 socket 3/4” x 3/4”
C - FRP flattie 2” x 1/2” x 21.50” L
D - Steel Block 2” x 2” x 3” L





LB & A, INC.	
CUSTOM CONDUIT HANGER	
DATE	SCALE NONE
DRAWN BY	DWG NO. 4CONAa





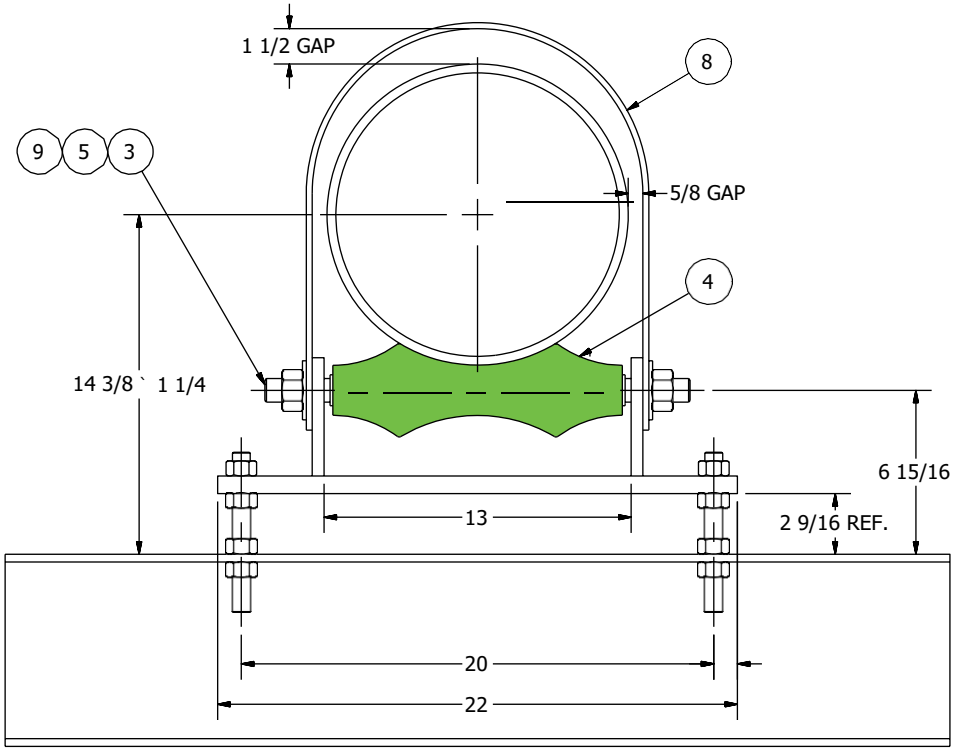
SECTIONAL VIEW

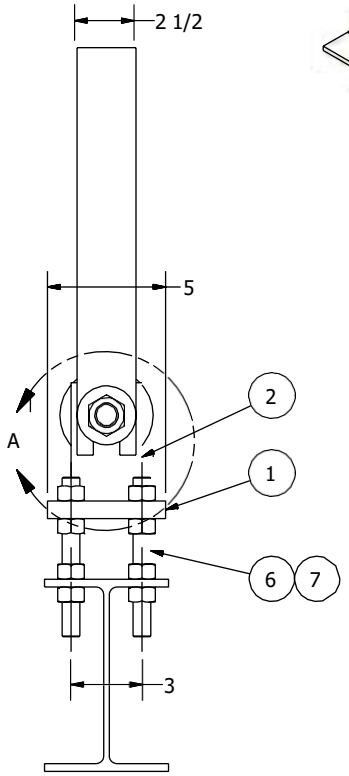
UTILITY SUPPORT DESIGN FOR ST. PAUL'S AVENUE

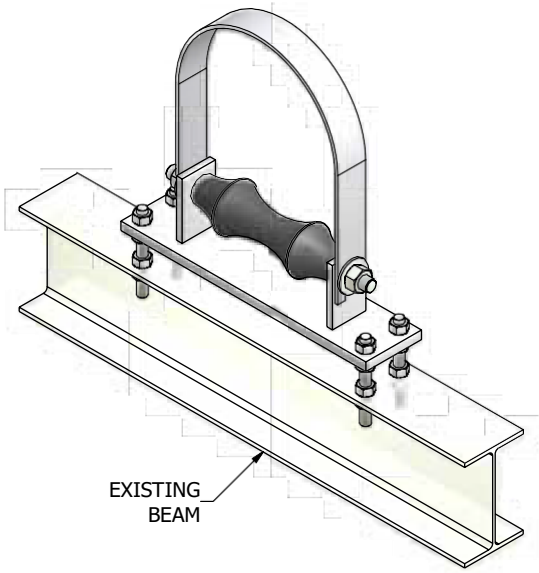
Note: 1. Utility support design and unit provided by LB&A Inc.
2. Each of these supports will be provided at a maximum spacing of 30" o.c.
3. Indicative sketch only - actual dimensions per shop dwg./cut sheets

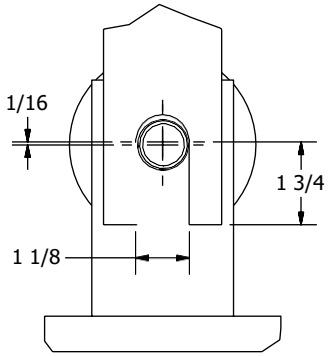
StPaulsAve_1_09

ITEM	QTY	TITLE	PART NUMBER	DESCRIPTION	LENGTH	WEIGHT EA. (lbf)	FINISH
1	1	BASE	BS-6040	FLAT STOCK 3/4" x 5"	22 in	2.92	
2	2	BEARING	BS-4024	FLAT STOCK 1/2" x 3"	5 in	0.26	
3	1	AXIAL	BR-0820	ROUND BAR 1"	18 in	0.51	E.G.
4	1	ROLLER	12H	NON-CONDUCTIVE PIPE ROLLER 12"		3.27	
5	2	NUT	785G-0008	HEX NUT, 1"		0.33	E.G.
6	4	STUD	755G-0006	THREADED ROD 3/4"	6 3/4 in	0.11	E.G.
7	16	NUT	785G-0006	HEX NUT 3/4"		0.14	E.G.
8	1	STRAP	BS-2020	FLAT STOCK 1/4" x 2-1/2"	42 3/8 in	7.17	
9	2	WASHER	795G-0008	ROUND WASHER 1"		0.18	E.G.









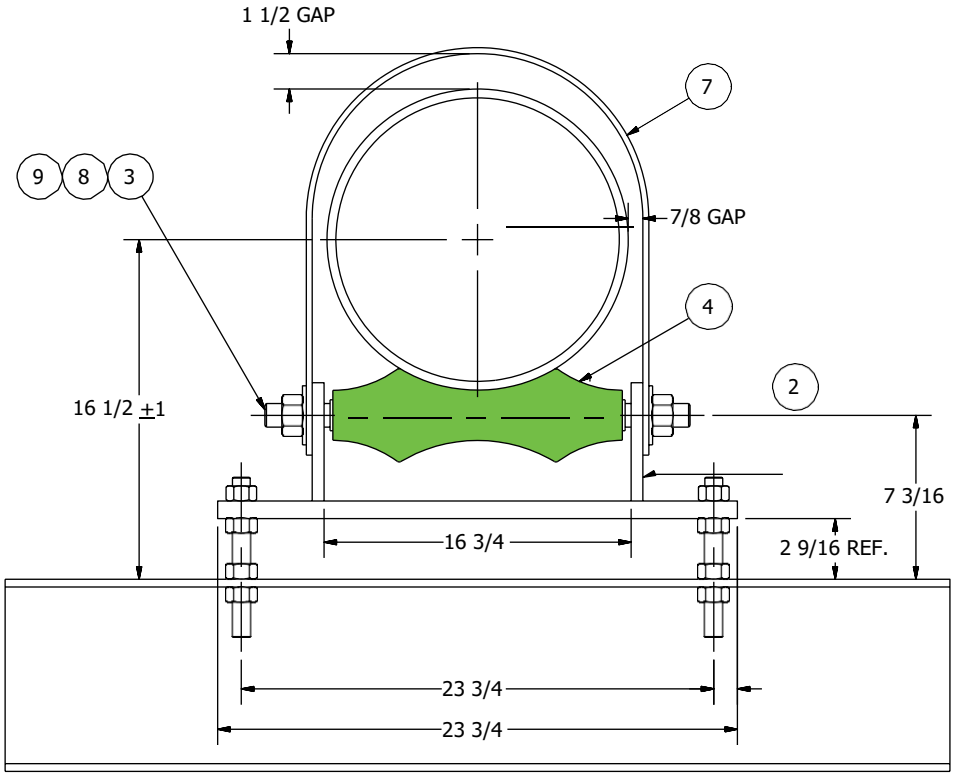
DETAIL A
SCALE 3 / 8

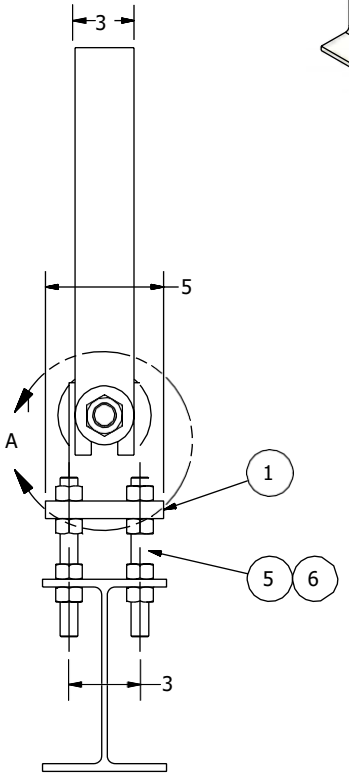
NOTES:
1. MAXIMUM RECOMMENDED LOAD = 1,400 lbf.
2. STRAP (ITEM 8) TO BE COATED WITH POLYOLEFIN.

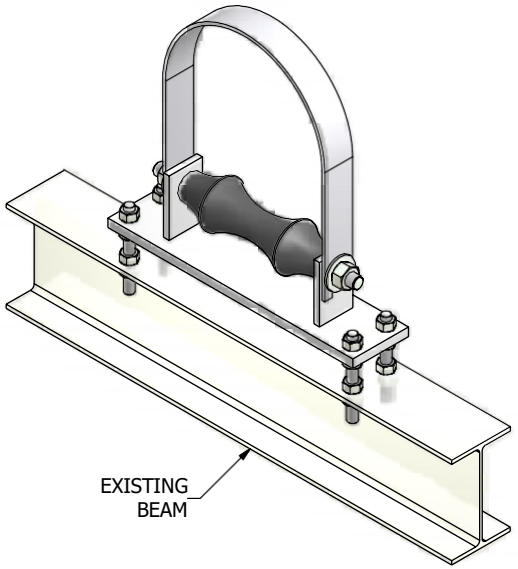
DESCRIPTION: 12" ADJUSTABLE PIPE ROLLER STAND								
LINN BROWN & ASSOCIATES, INC.					JOB			
DRAWN BY: JTOY		CHECKED BY: GR	SCALE: 3/16" = 1"	ORDER NO.	DRAWING. NO.: RLR12	SHEET: 1 OF 1	REV.: 1	TAG

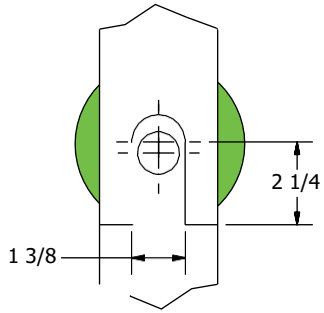
LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

ITEM	QTY	TITLE	PART NUMBER	DESCRIPTION	LENGTH	WEIGHT EA. (lbf)	FINISH
1	1	BASE	BS-8040	FLAT STOCK 1" x 5"	25 3/4 in	35.97	
2	2	BEARING	BS-4024	FLAT STOCK 1/2" x 3"	5 in	1.92	
3	1	AXIAL	BR-1020	ROUND BAR 1-1/4"	22 in	7.66	E.G.
4	1	ROLLER	16H	NON-CONDUCTIVE PIPE ROLLER 16"		7.19	
5	4	STUD	755G-0006	THREADED ROD 3/4"	6 3/4 in	0.85	E.G.
6	16	NUT	785G-0006	HEX NUT 3/4"		0.14	E.G.
7	1	STRAP	BS-2024	FLAT STOCK 1/4" x 3"	51 1/2 in	10.43	
8	2	WASHER	795G-0010	FLAT WASHER 1-1/4"		0.26	E.G.
9	2	NUT	790G-0010	HEAVY HEX NUT 1-1/4"		0.77	E.G.







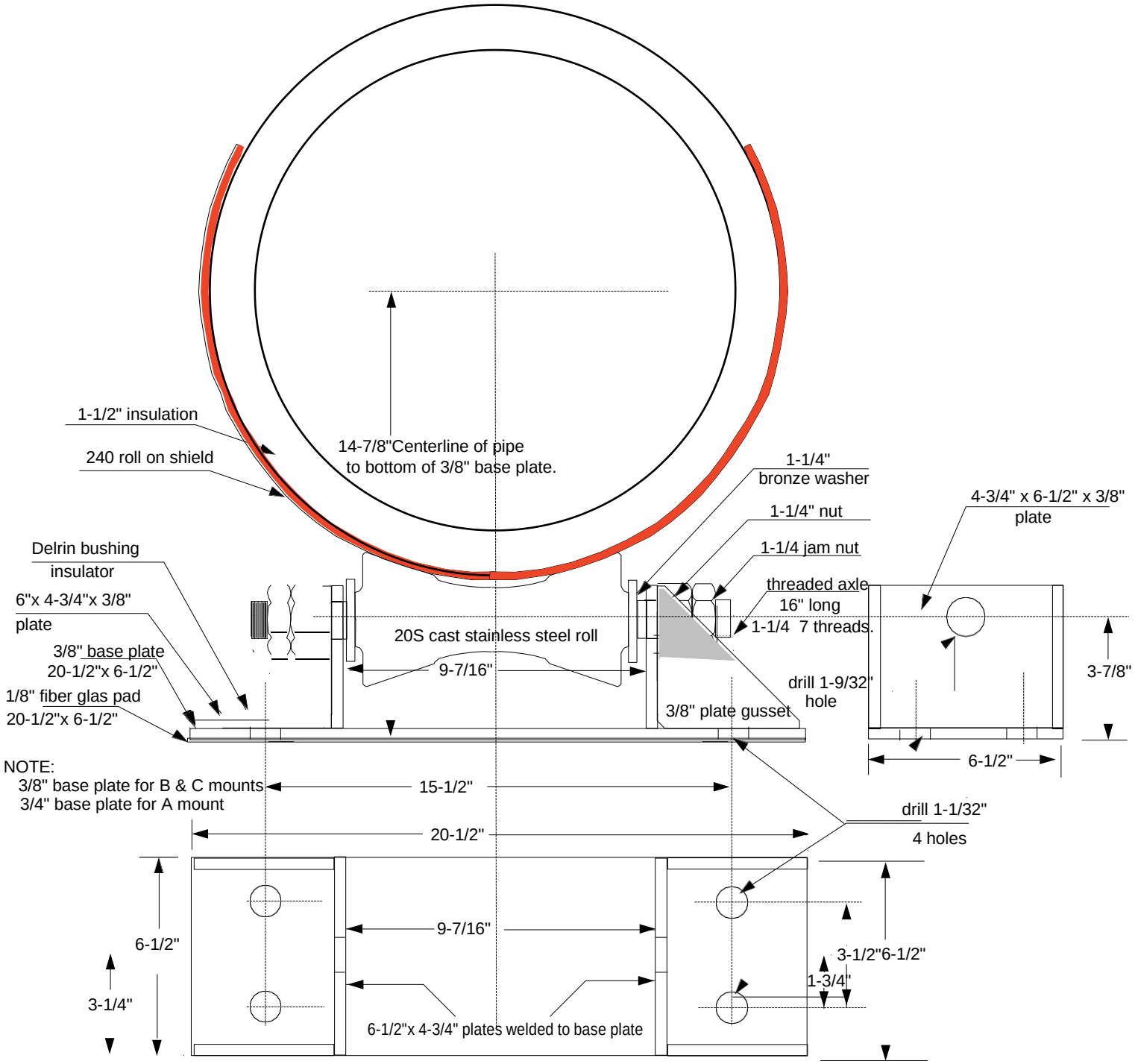


DETAIL A
SCALE 3 / 8

NOTES:
1. MAXIMUM RECOMMENDED LOAD = 1,800 lbf.
2. STRAP (ITEM 7) TO BE COATED WITH POLYOLEFIN.

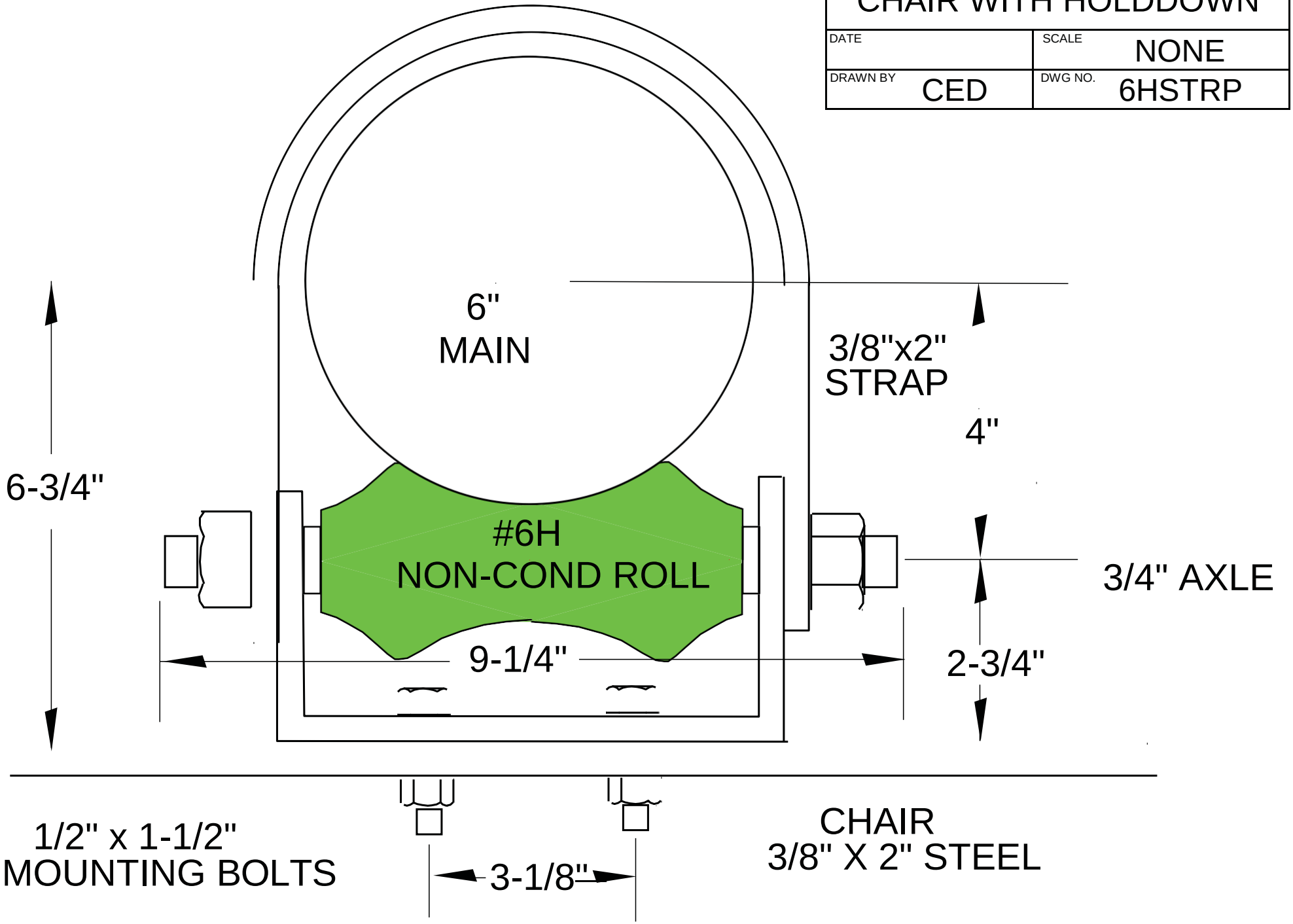
DESCRIPTION								
16" ADJUSTABLE PIPE ROLLER STAND								
LINN BROWN & ASSOCIATES, INC.					JOB			
DRAWN BY		CHECKED BY	SCALE	ORDER NO.	DRAWING. NO.	SHEET	REV.	TAG
JTOY		GR	NTS		RLR16	1 OF 4	1	

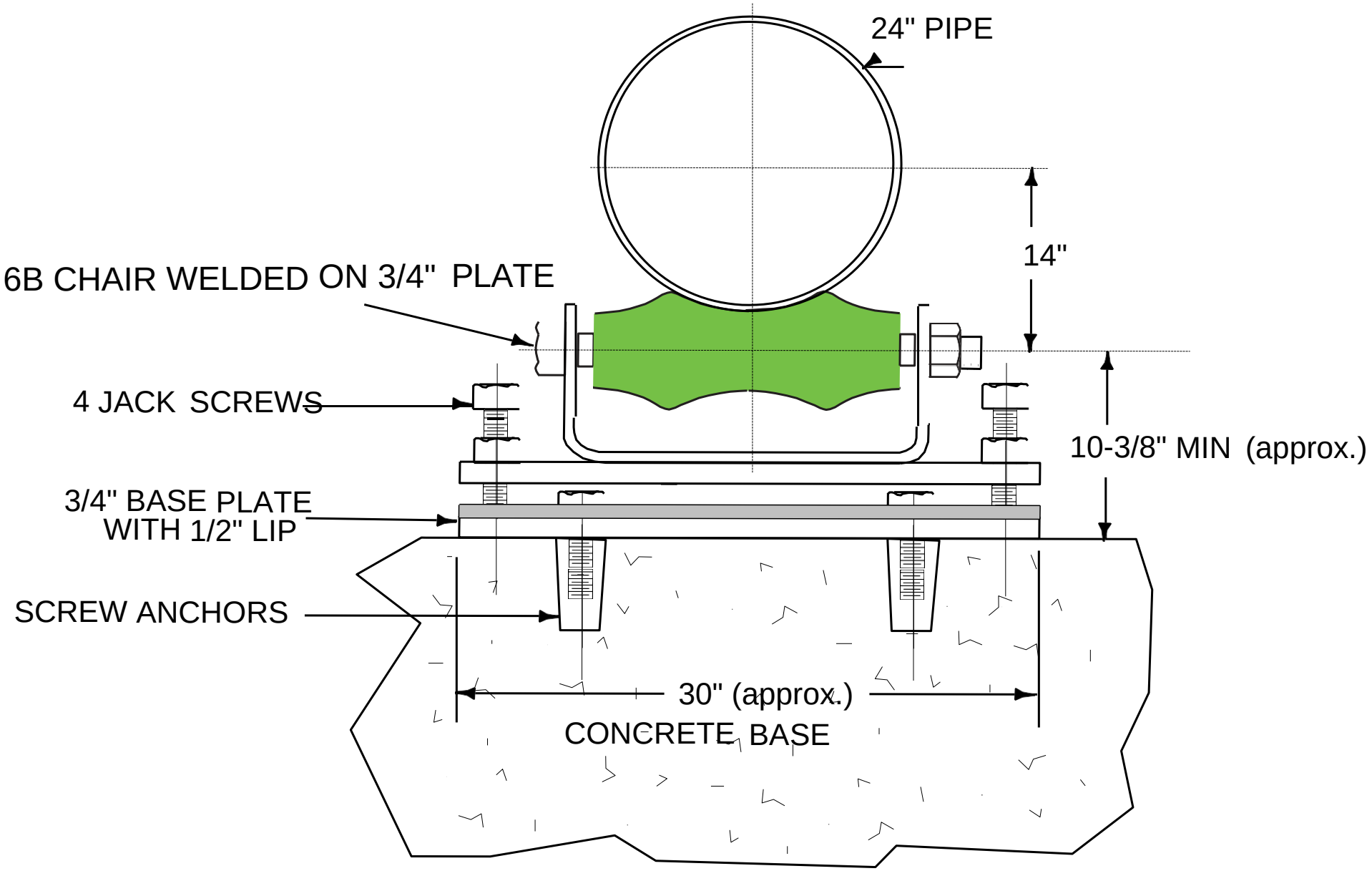
LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY



LB&A. INC.	
Special stainless steel 20" Roller Chair	
DATE	SCALE none
DRAWN BY CED	DWG NO. 6spec20

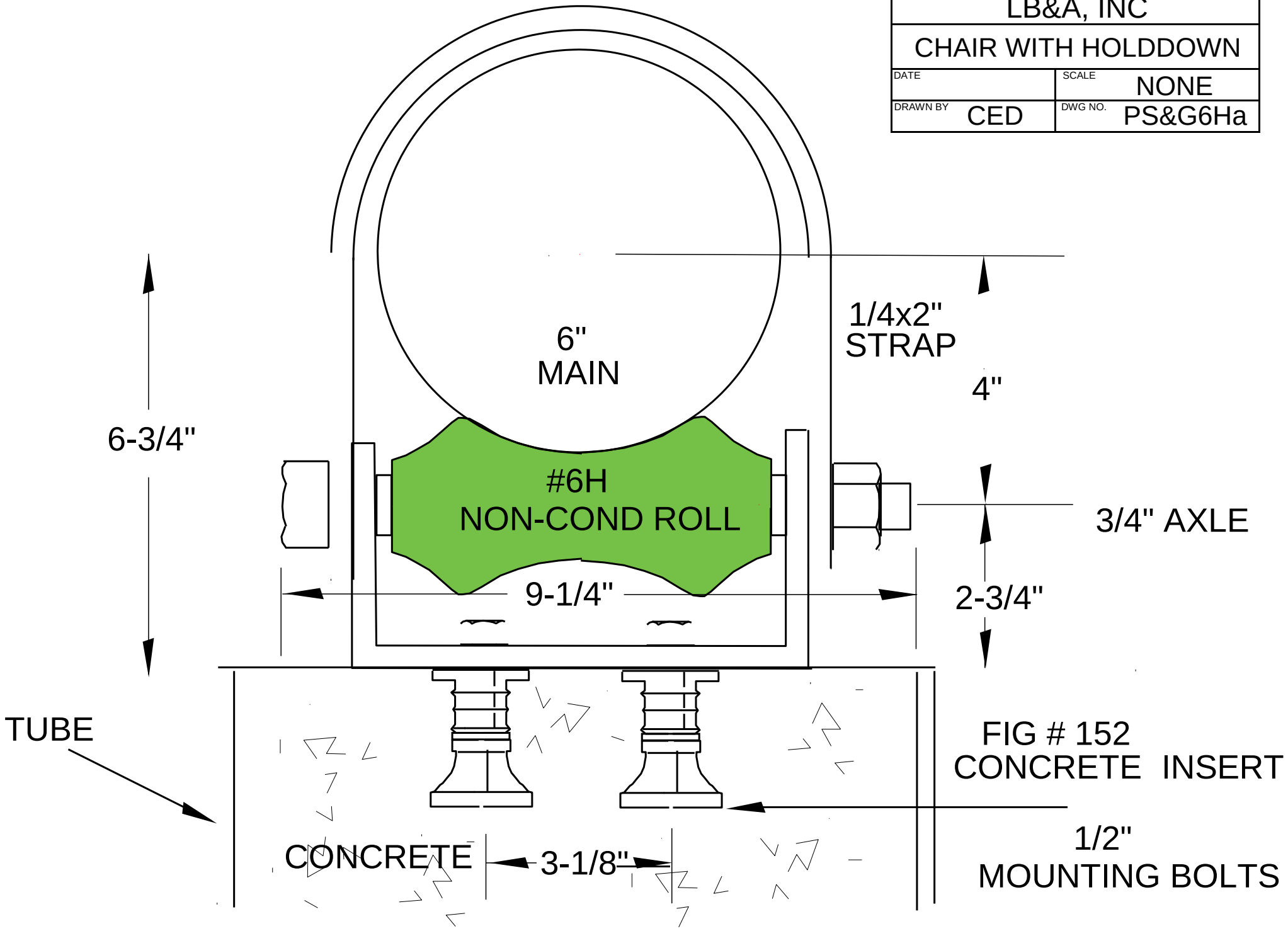
LB&A, INC	
CHAIR WITH HOLDDOWN	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 6HSTRP

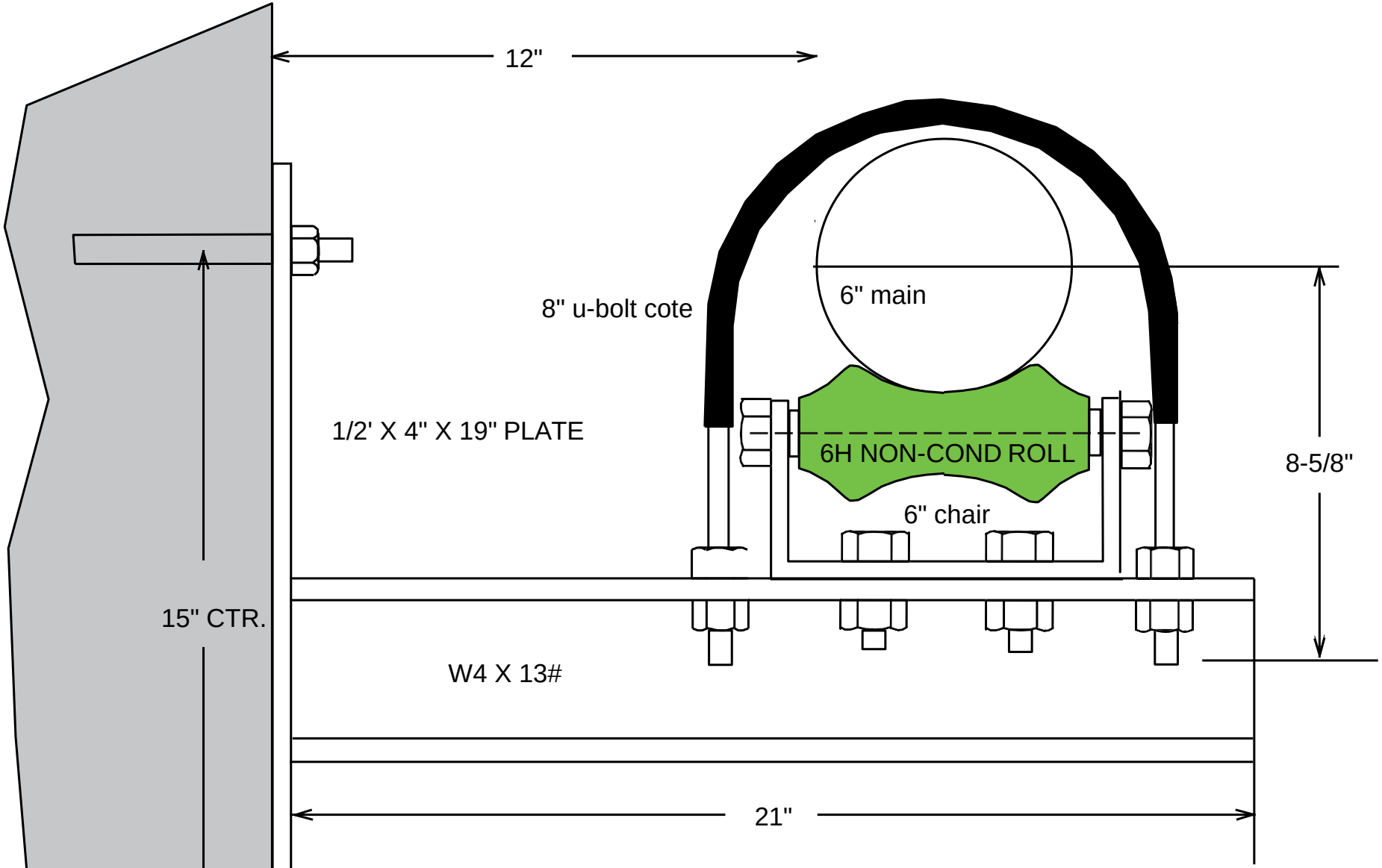




LB&A,INC.	
ADJUSTABLE ROLLER CHAIR	
DATE	SCALE NONE
DRAWN BY CED	CATALOG PG. NO. CON6Ba

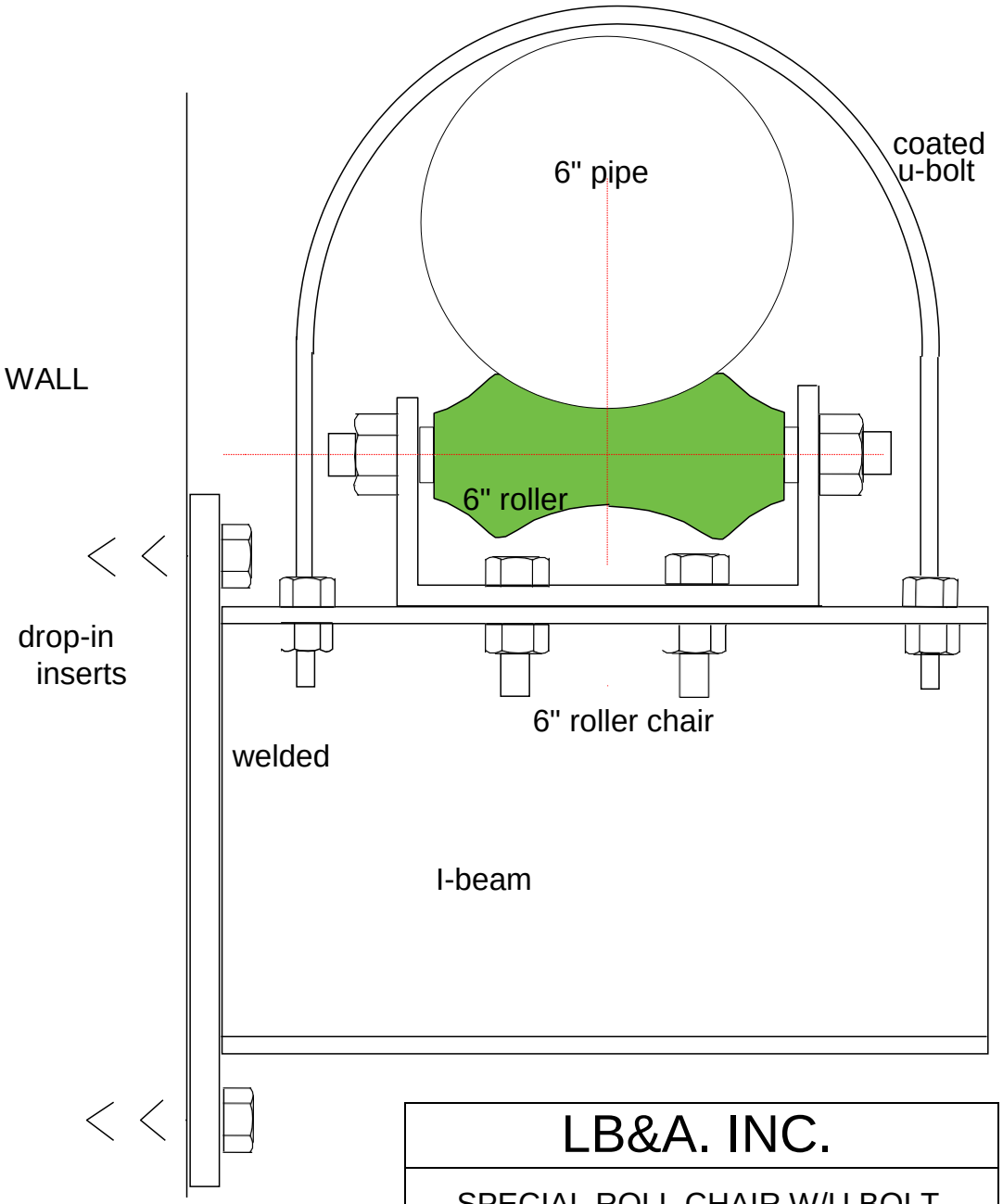
LB&A, INC	
CHAIR WITH HOLDDOWN	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. PS&G6Ha

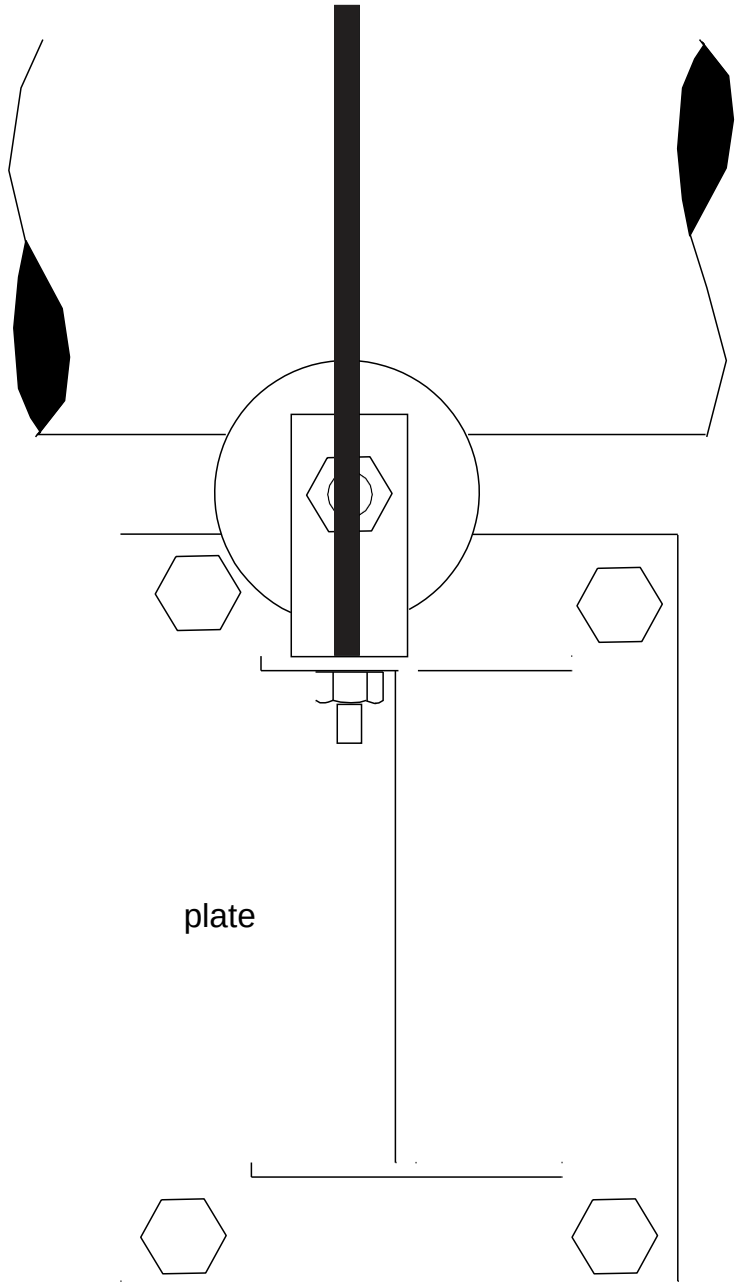




LB&A,INC.	
PIPE ROLLER CHAIR W/U-BOLT	
DATE	SCALE NONE
DRAWN BY CED	CATALOG PG. NO. ROLCHR1a

MAX LOAD 2000#
QUANTITY 8
GALVANIZED

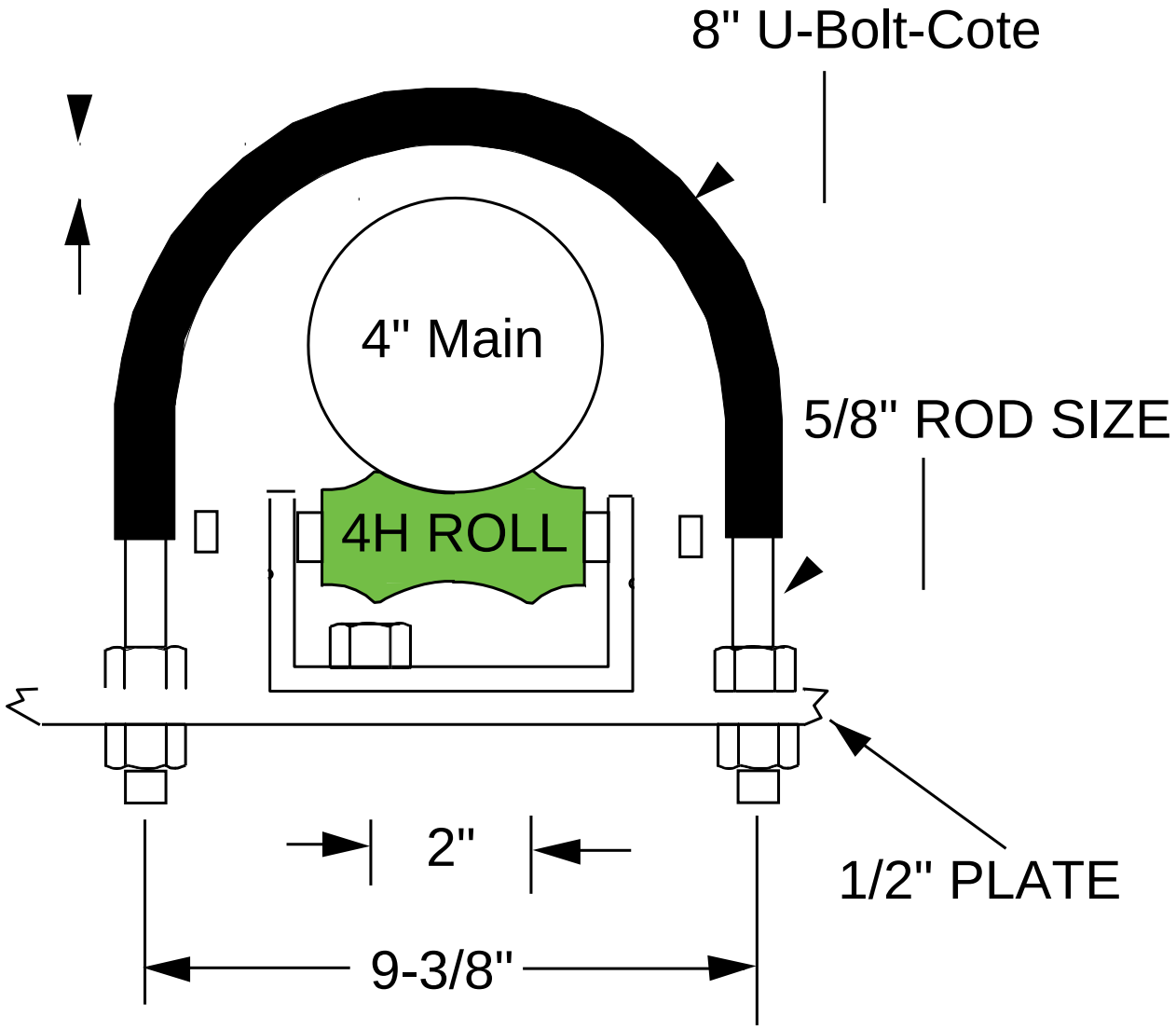




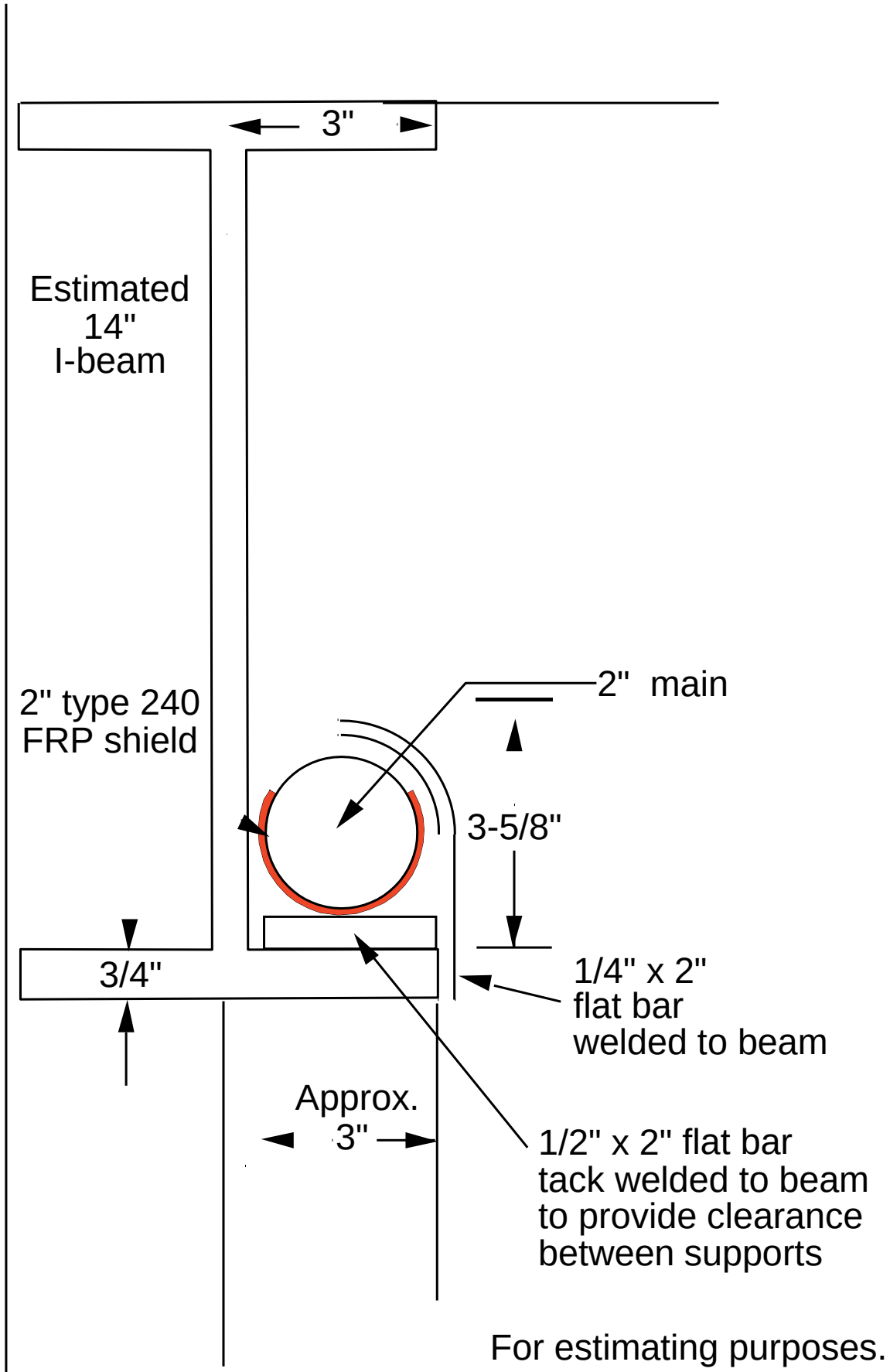
LB&A. INC.	
SPECIAL ROLL CHAIR W/U BOLT	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 6HROLL1a

NOTE:
FOR ESTIMATING PURPOSES ONLY - NO SCALE

Top clearance 3/4" min to
1-5/8" max using U-Bolt threads

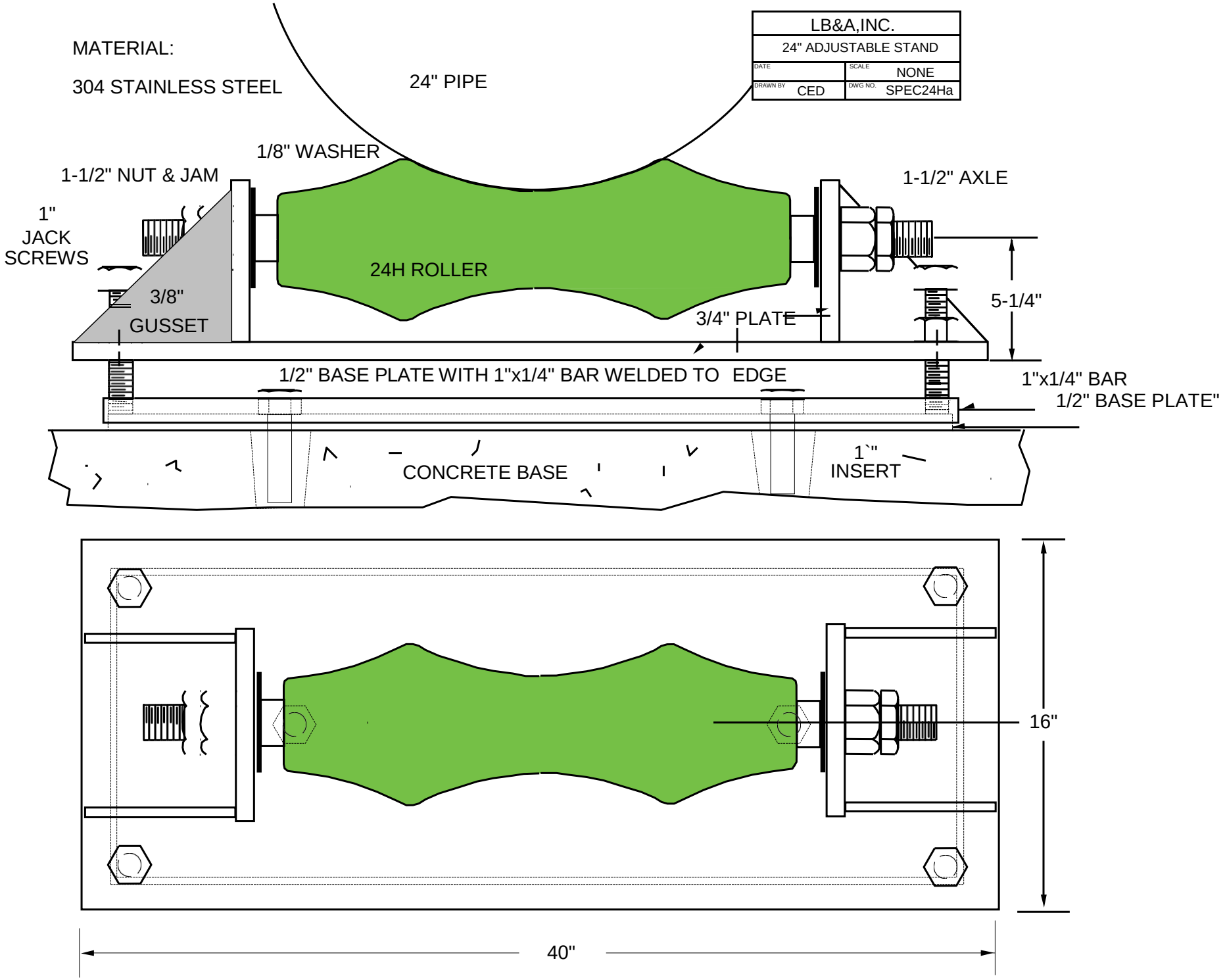


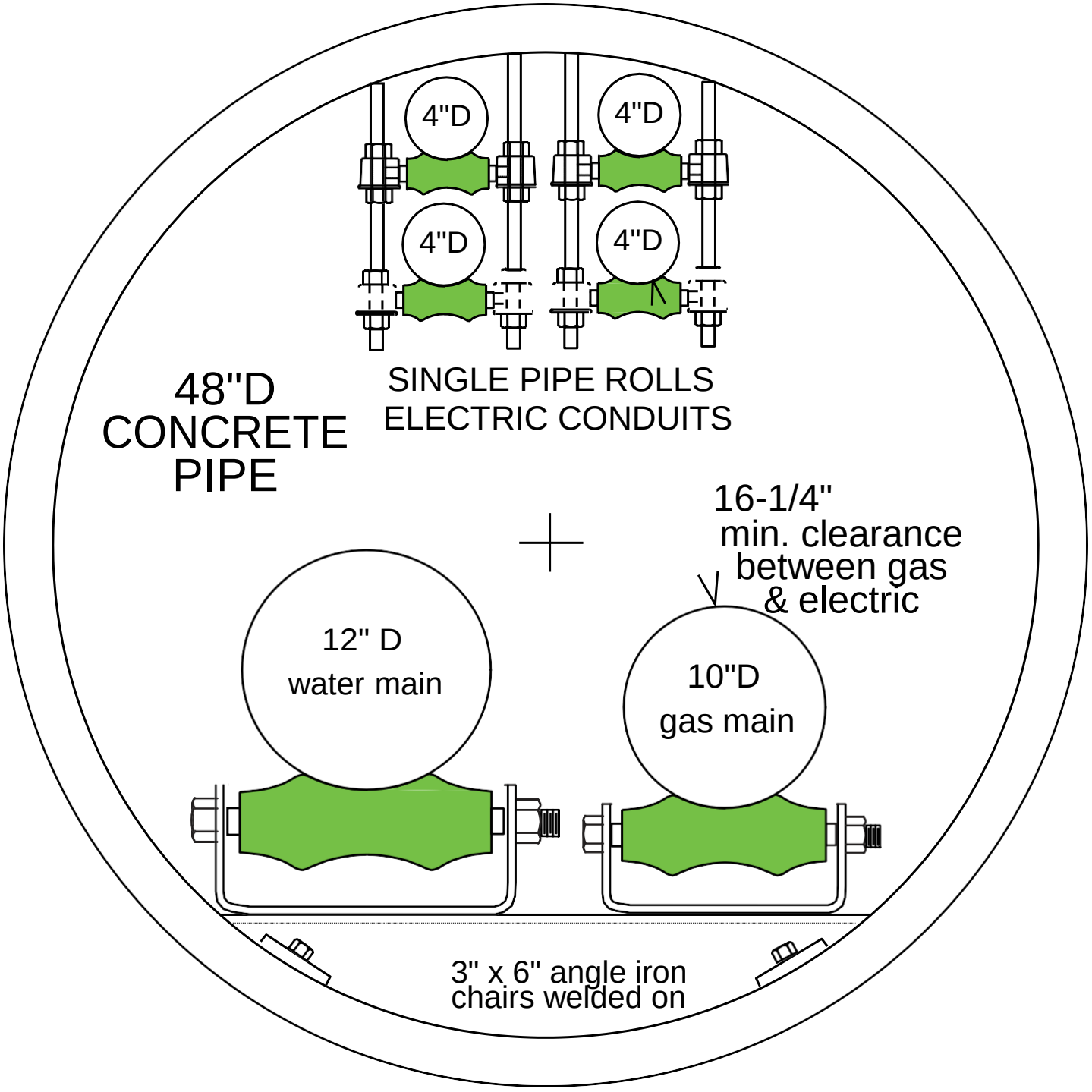
LB&A, INC.	
4HROLL w/ U-Bolt-Coat	
DATE	SCALE none
DRAWN BY CED	DWG NO. 4char6a



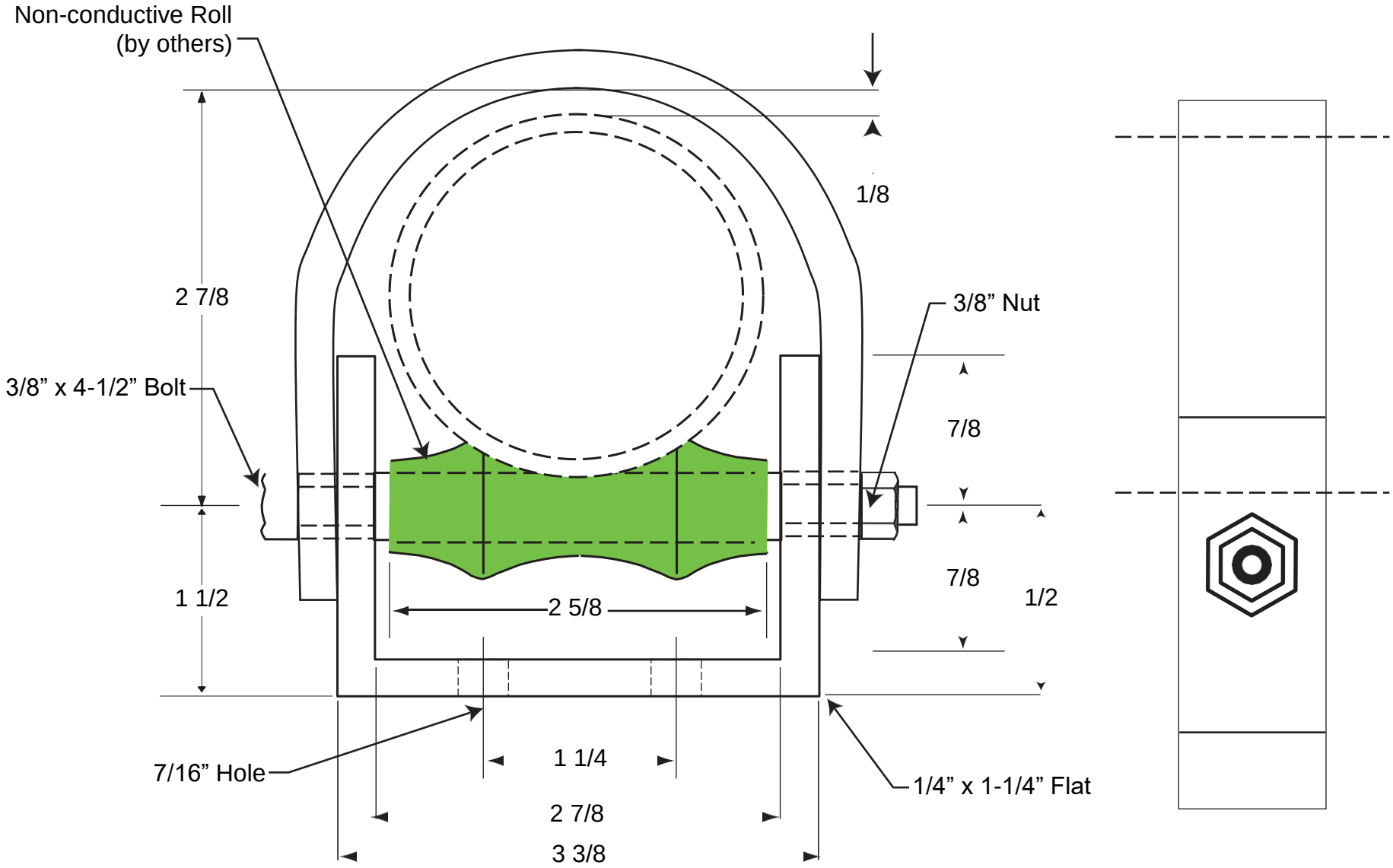
For estimating purposes.

LB&A, INC.	
Custom 2" Main Support	
DATE	SCALE none
DRAWN BY CED	DWG NO. norilga


LB&A,INC.
24" ADJUSTABLE STAND
DATE
SCALE
NONE
DRAWN BY
CED
DWG NO.
SPEC24Ha
MATERIAL:
304 STAINLESS STEEL
24" PIPE
1/8" WASHER
1-1/2" NUT & JAM
1-1/2" AXLE
1"
JACK
SCREWS
24H ROLLER
3/8"
GUSSET
3/4" PLATE
5-1/4"
1/2" BASE PLATE WITH 1"x1/4" BAR WELDED TO EDGE
1"x1/4" BAR
1/2" BASE PLATE"
CONCRETE BASE
1`"
INSERT
16"
40"



LB & A, INC.	
SPECIAL 6 MAIN INSTALL.	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 48x10x4b



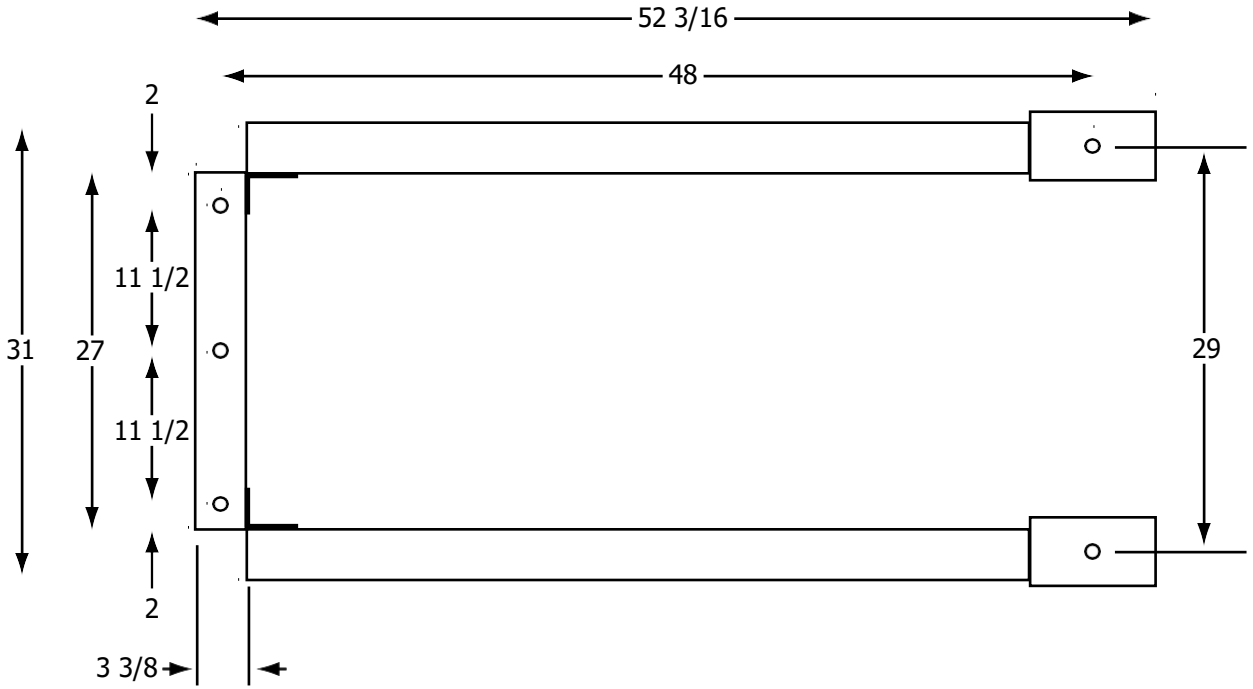
DESCRIPTION
2" Non Conductive Roller Base with Hold Down Strap

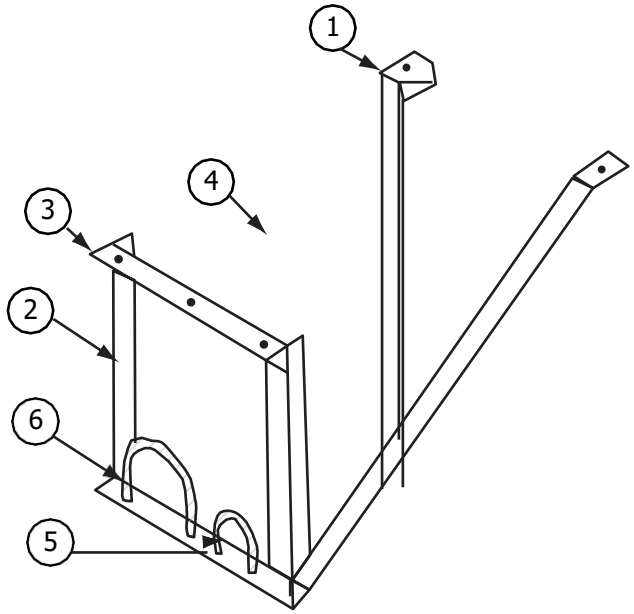
LINN BROWN ASSOCIATES, INC.

DRAWING. NO.
NCR_W_HDS_1_09

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

Parts List				
ITEM	QTY	SIZE	DESCRIPTION	LENGTH
1	2	L 3 x 3 x 1/4	Angle Steel	6
2	2	L 3 x 3 x 1/4	Angle Steel	34
3	2	L 3 x 3 x 1/4	Angle Steel	27
4	2	L 2.5 x 2.5 x 1/4	Angle Steel	59
5	1	8″	U-Bolt	
6	1	6″	U-Bolt	

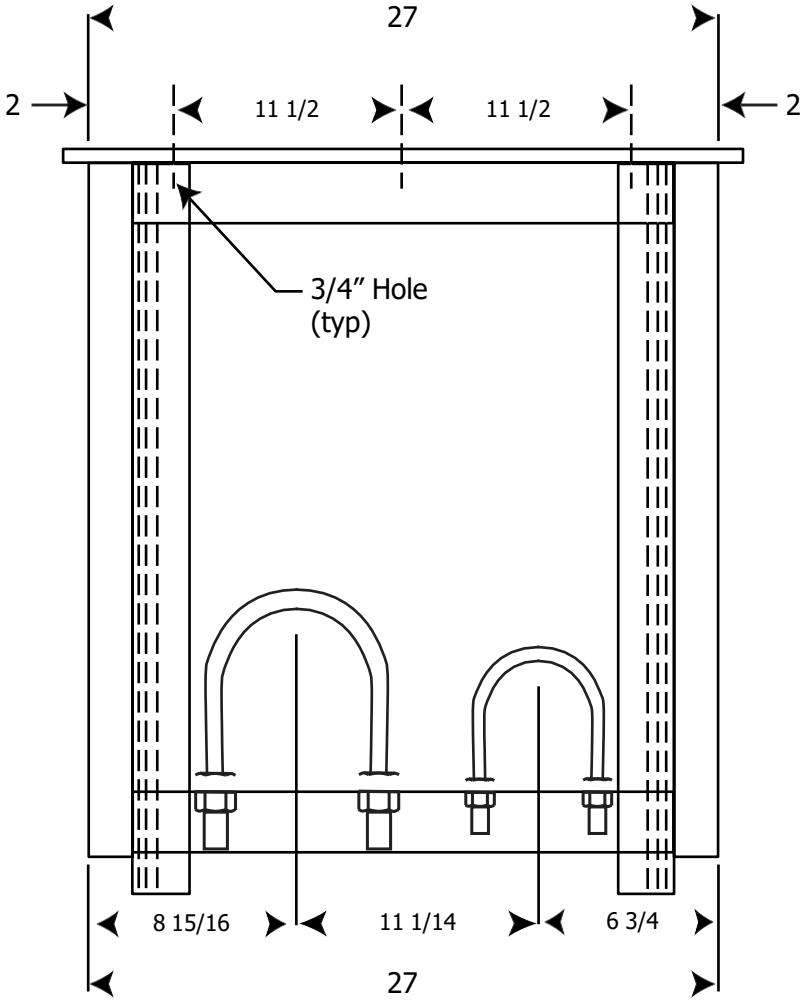


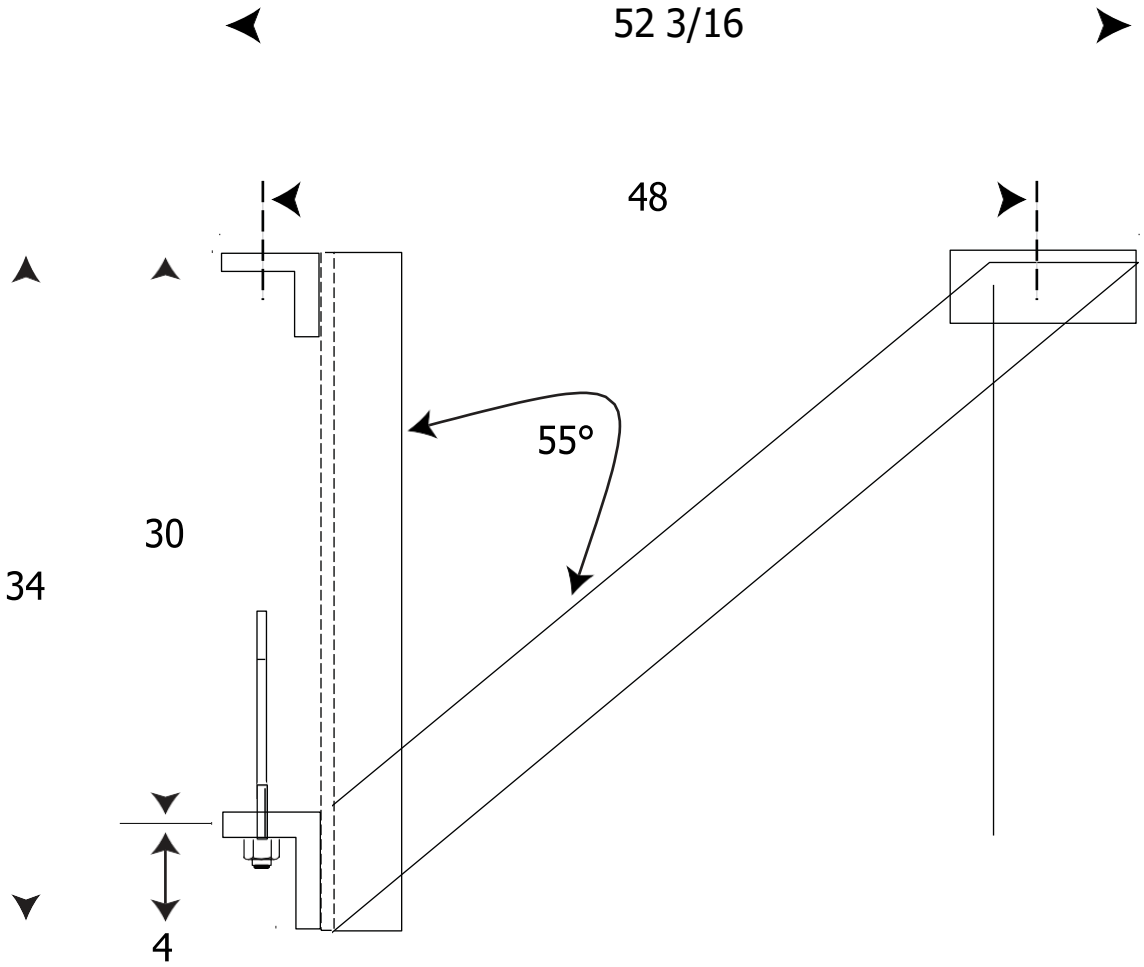


DESCRIPTION	FINISH	UNIT QTY.
Trapeze Hanger		

PROJECT						
		SCALE	ORDER NO.	DRAWING NO.	SHEET	REV.	TAG
			001307	TRAP_HANG_1_09	2 OF 2	0	

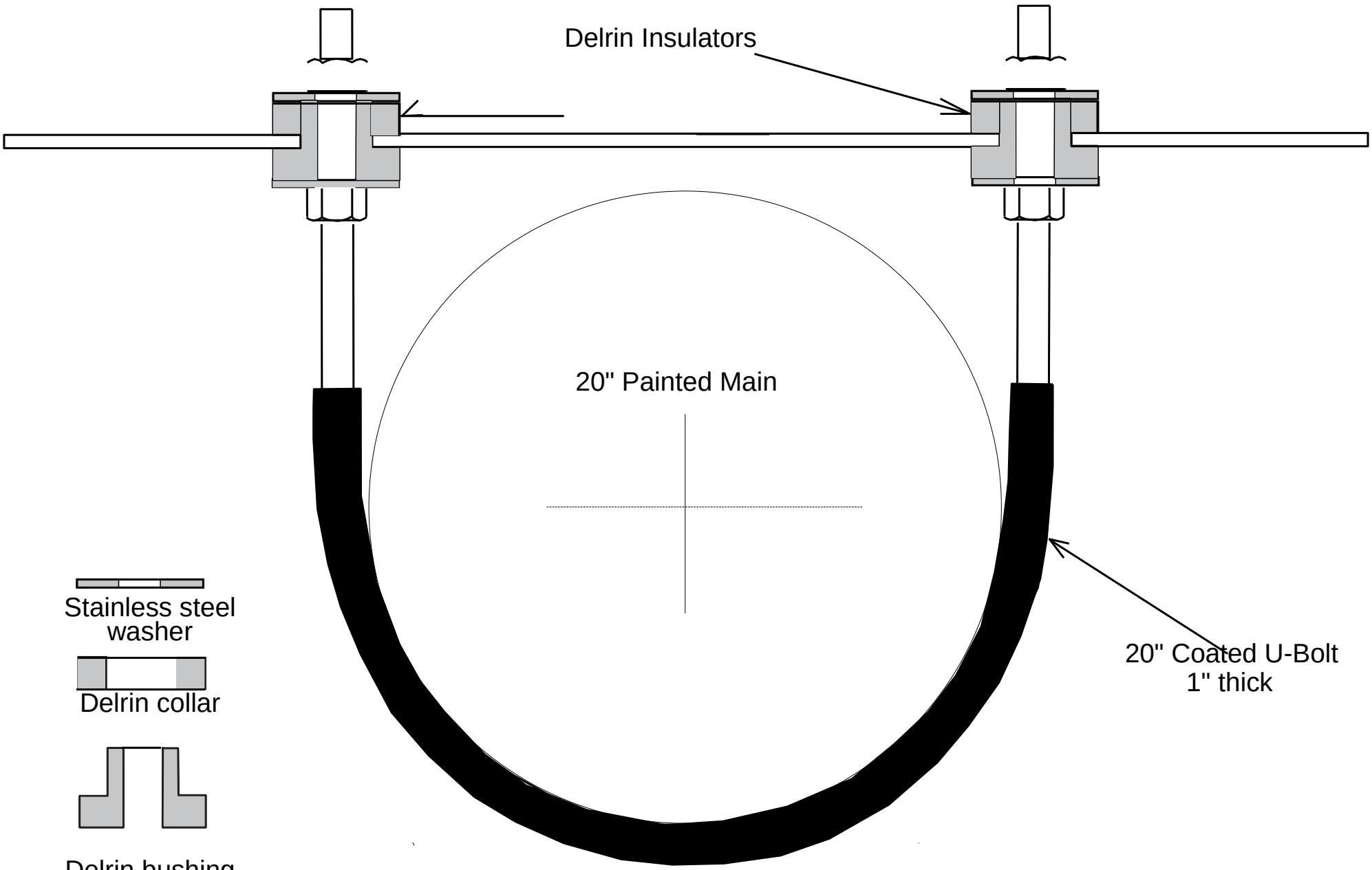
LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY





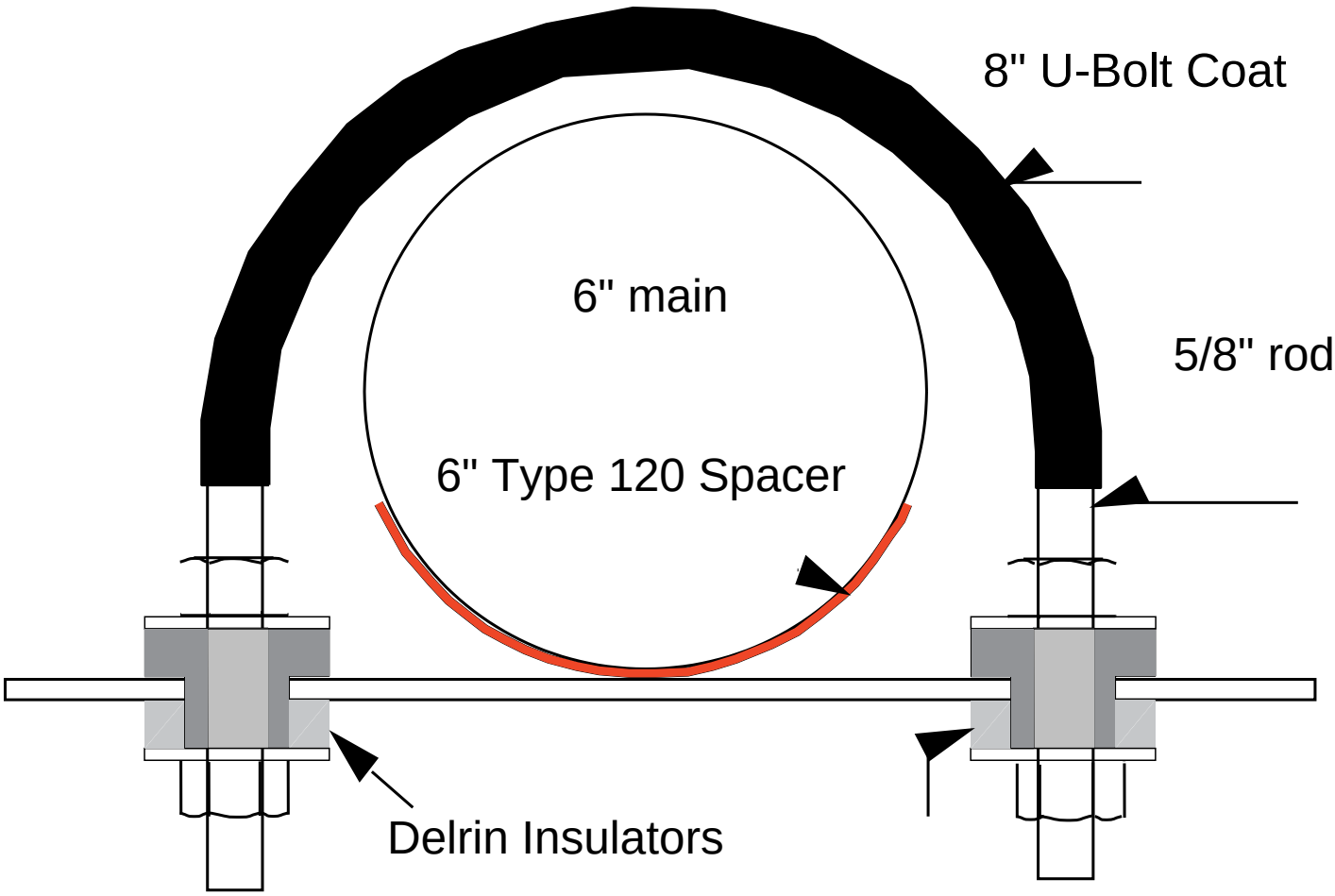
DESCRIPTION							
Trapeze Hanger 2							
			ORDER NO.	DRAWING NO.	SHEET	REV.	TAG
			001307	TRAP_HANG_2_2_09	2 OF 2	0	

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY

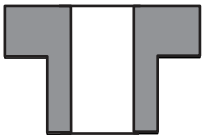


4 Piece Insulator

LB&A. INC.	
Special 20" Pipe w/ 20" coated U-Bolt	
DATE	SCALE none
DRAWN BY CED	DWG NO. EQ20a



Stainless Steel Washer



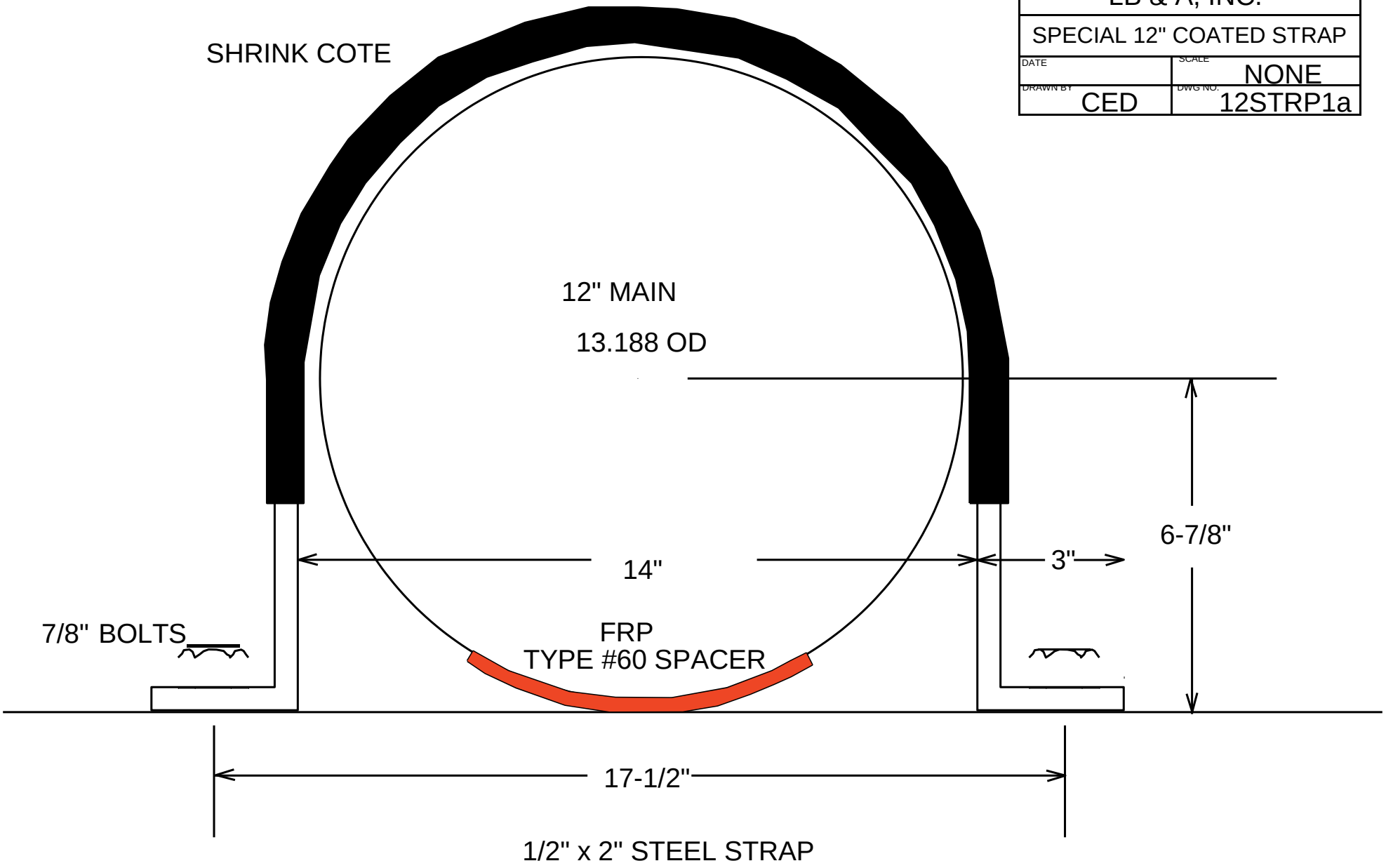
Delrin Bushing

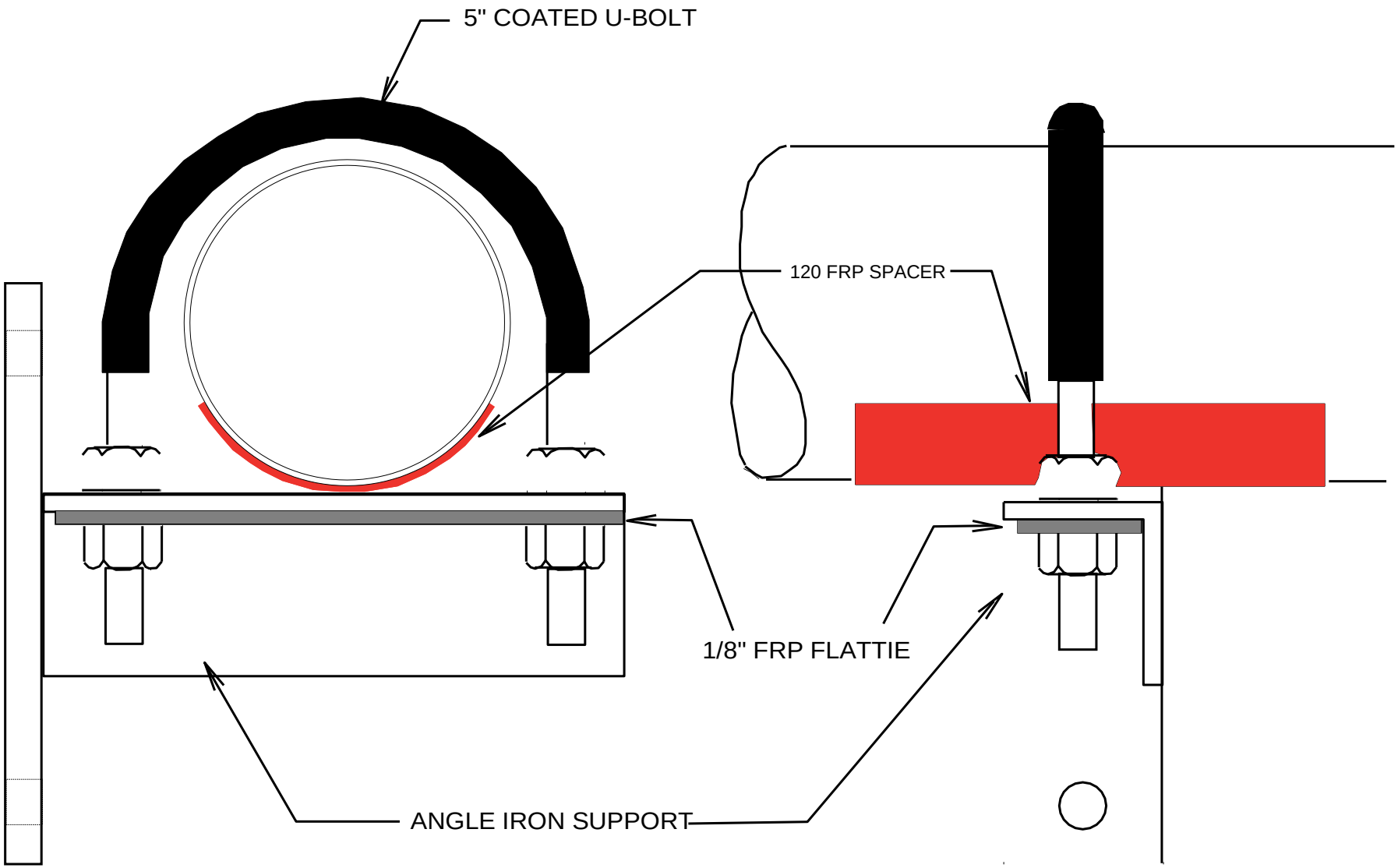
Delrin Collar

Stainless Steel Washer

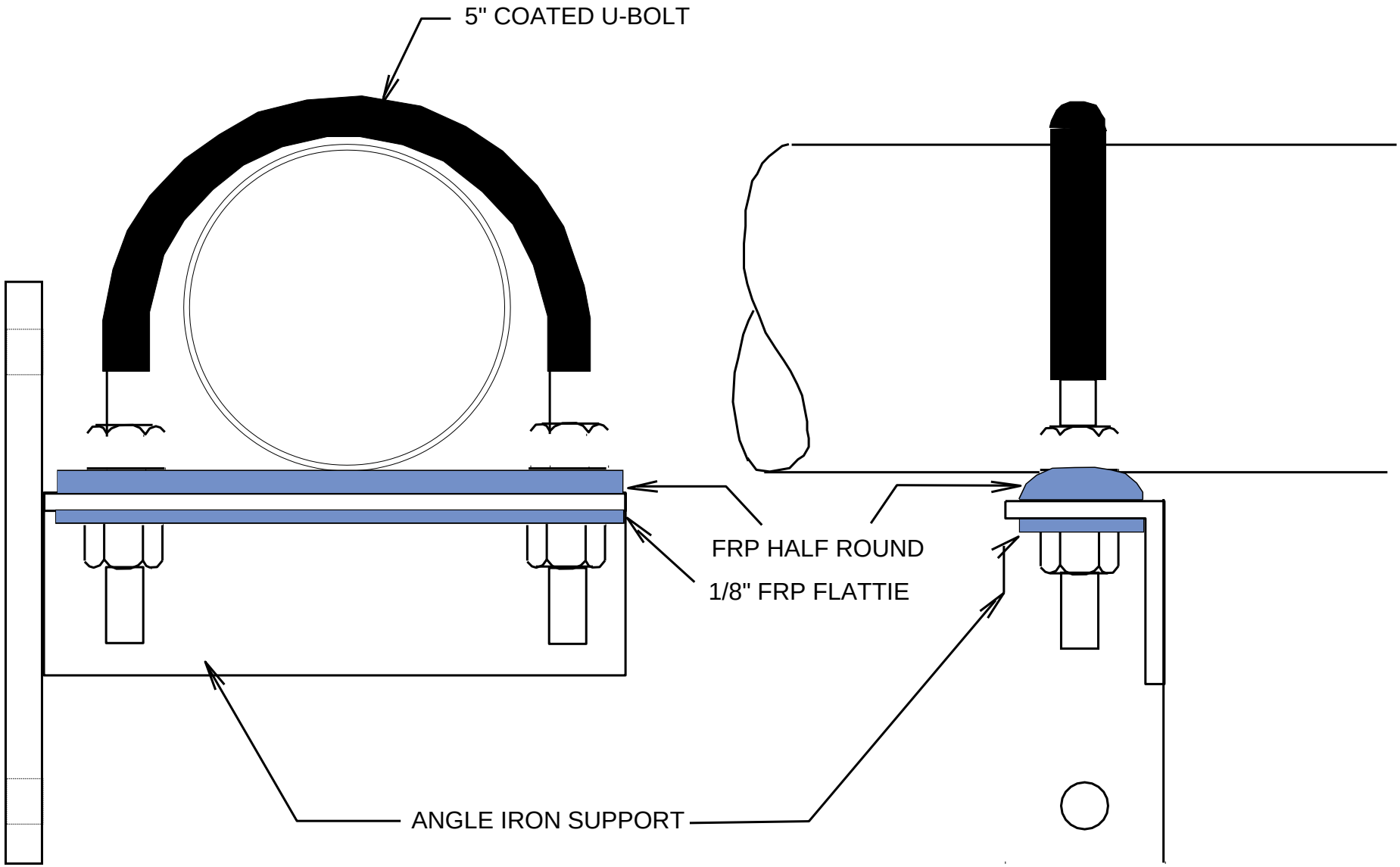
LB&A, INC.	
6"main w\8" u-bolt cote & bushings with 6" type# 120 Spacer	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. bushc

LB & A, INC.	
SPECIAL 12" COATED STRAP	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. 12STRP1a

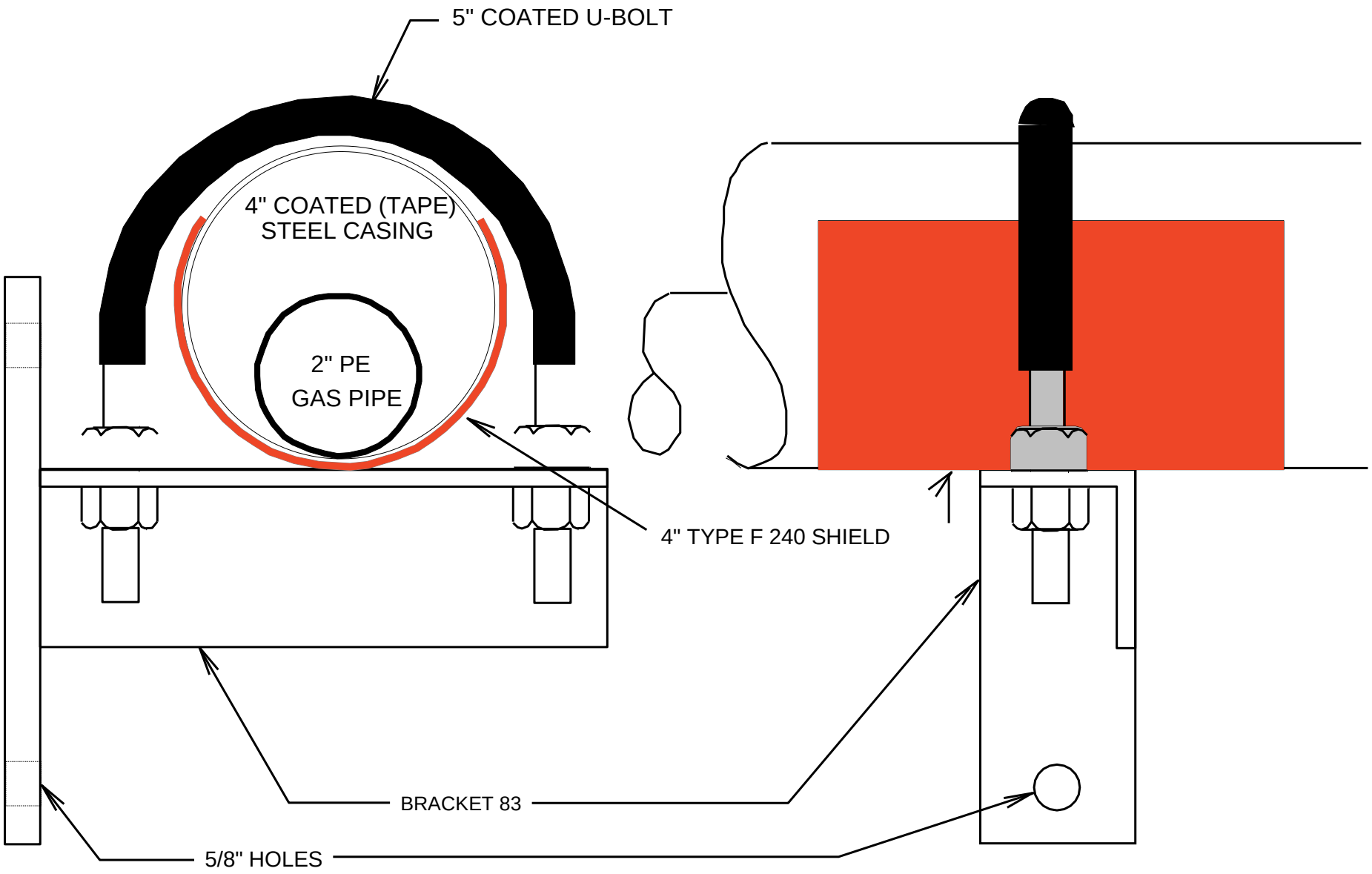




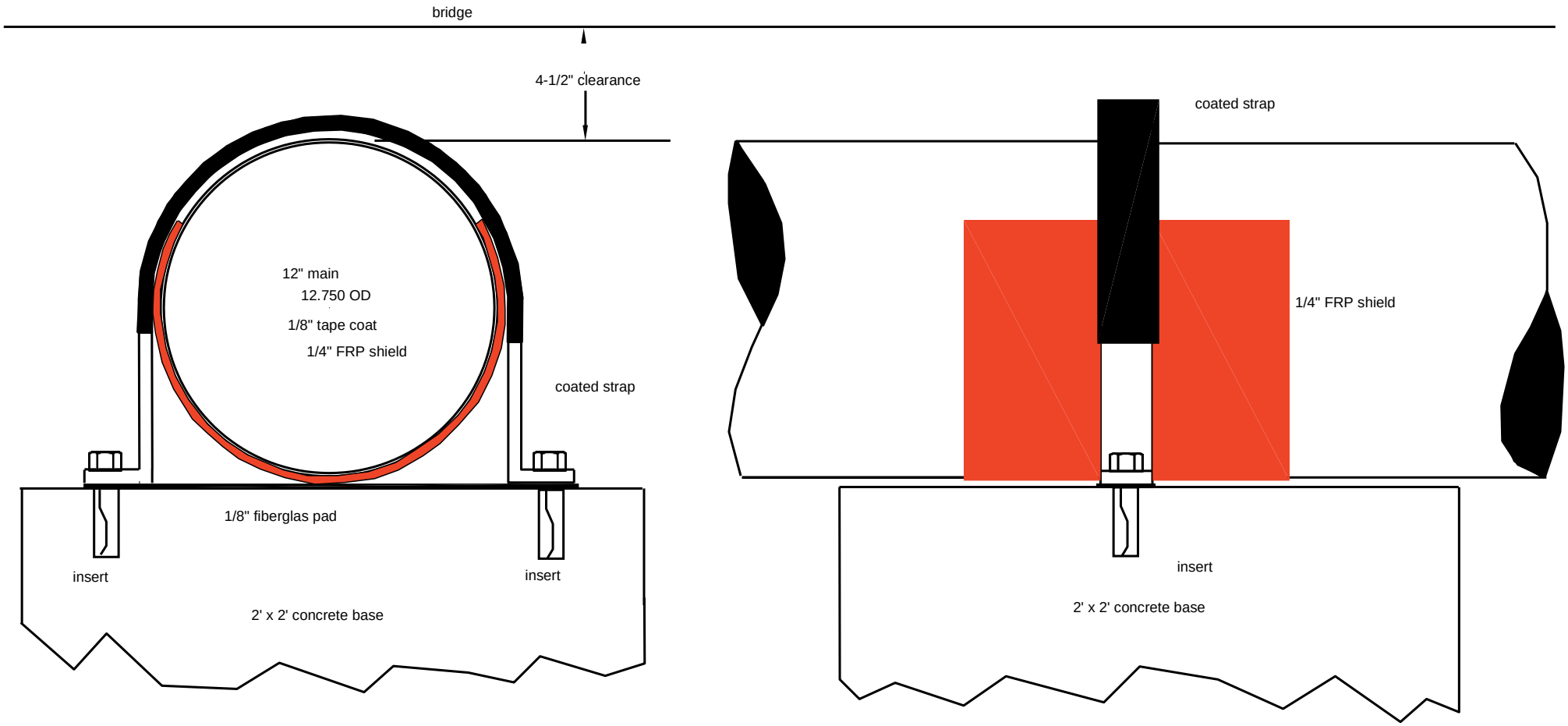
LB&A, INC.	
ANGLE IRON SUPPORT W/PIPE,U-BOLT&120 SPACER	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. BR83E



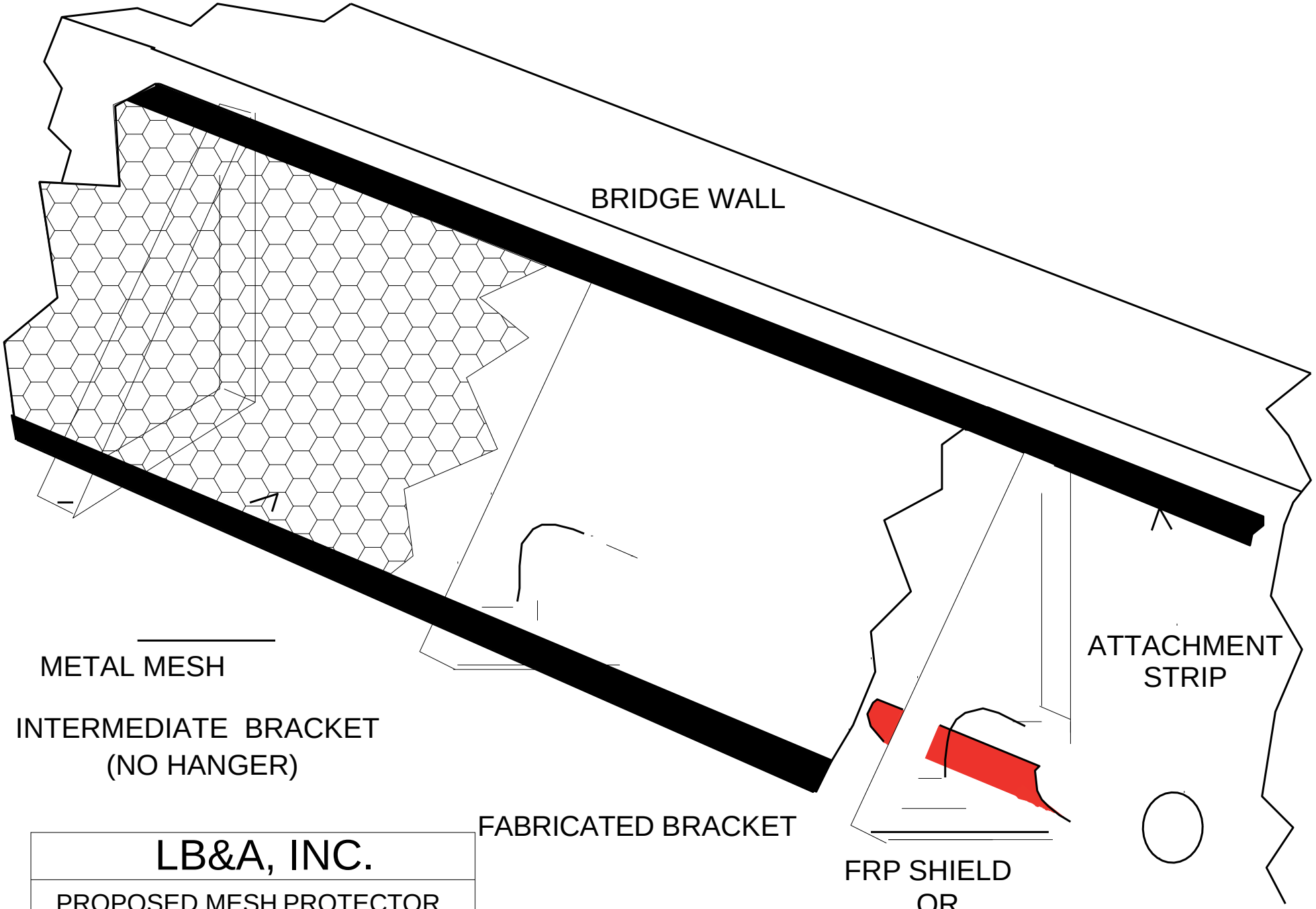
LB&A, INC.	
ANGLE IRON SUPPORT W/PIPE, U-BOLT & HALF RNDS	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. BR83D



LB&A, INC.	
BRACKET #83 W/4" CASING & U-BOLT	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. BR83B

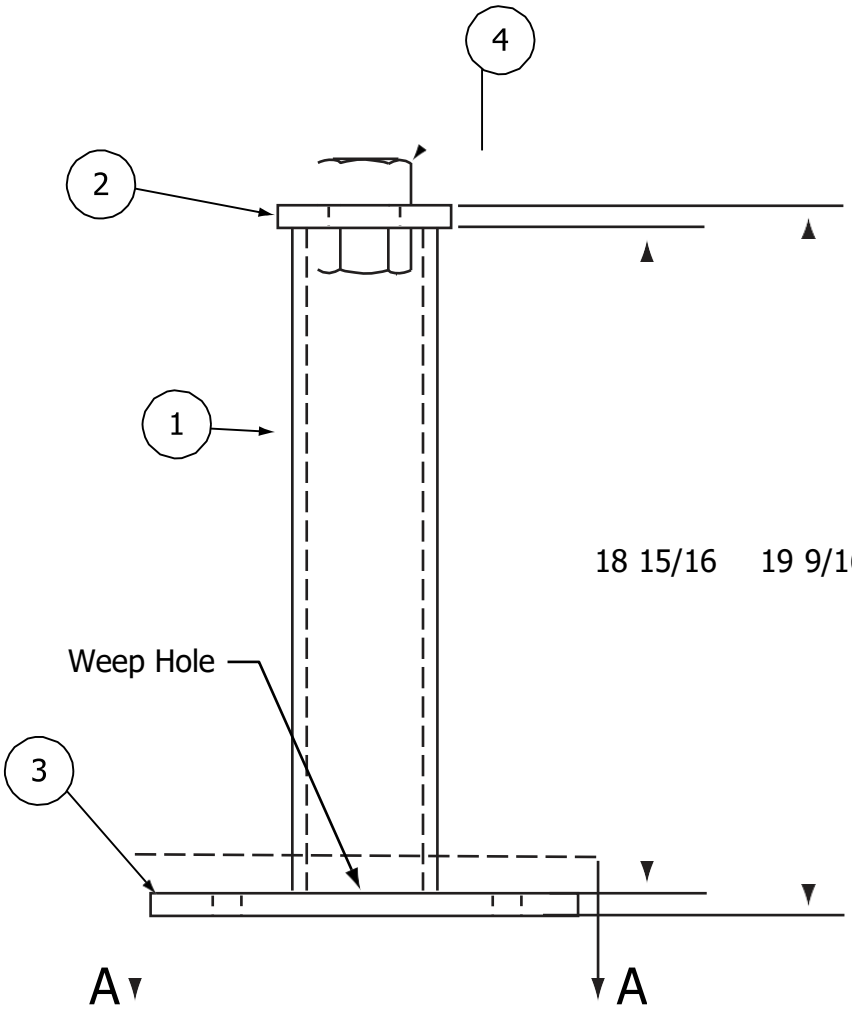


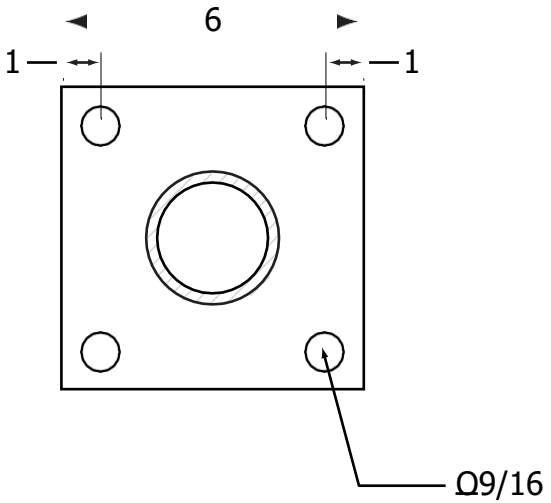
LB&A, INC.	
Special 12" pad mount with coated strap	
DATE	SCALE none
DRAWN BY CED	DWG NO. 12pad1



LB&A, INC.	
PROPOSED MESH PROTECTOR	
DATE	SCALE NONE
DRAWN BY CED	DWG NO. ISOBKTx1

Parts List		
ITEM	QTY	DESCRIPTION
1	1	2″ Pipe
2	1	1/4″ x 3″ x 3″ Plate
3	1	3/8″ x 6″ x 6″ Plate
4	2	7/8″ Hex Nut

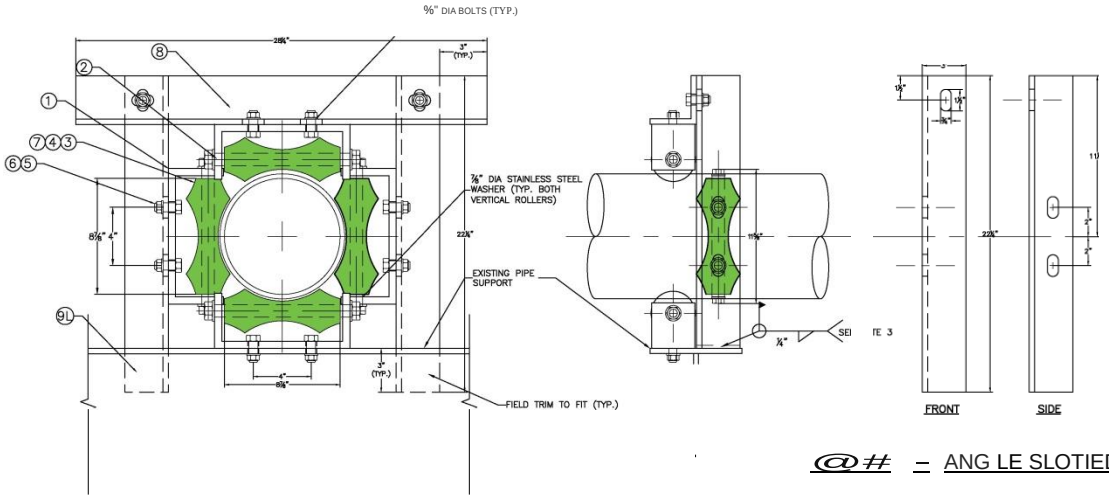


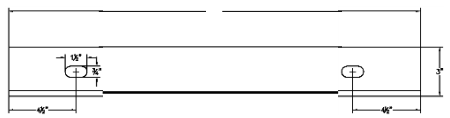


SECTION A-A

DESCRIPTION					FINISH		UNIT QTY.
#260 Pipe Stand					EG		4
				PROJECT			
		SCALE	ORDER NO.	DRAWING NO.	SHEET	REV.	TAG
		5/16" = 1"	000950	260Pipe_Stand_12_08	1 OF 1	0	

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY





@# – ANGLE SLOTIED HOLE DETAIL

ITEM	Q1Y	TmE	PART NUMBER	DESCRIPTION	CENGIH	MATERIAL
1	4	BEARING	BS-4024	BAR -x 2"		'36 STEa GALVANIZED
2	4	ttttttt	BR 0820	ROUND BAR L..L" QU,. TBE 1	11 III IN.	016 STAINLESS STEEL
▮	4	ROLI.ER	8H	NON-CONDUCTIVE PIPE ROLLER ES WITH SLEEVE FOR AXLE	tsr. IN.	POLTUREB-V NE. J16 STAINLESS STEEL SLEEVE
4	8	,ur	785G 0008			
5	10	SIUD	755G 0006			
8	10	,ur	[redacted]			
7	8	WA.SHER	[redacted]			
8	1	N>GCE			2al'. IN.	
9R	1	A,GCE			221'. IN.	
▮▮	1	mGCE			221'. IN.	

m

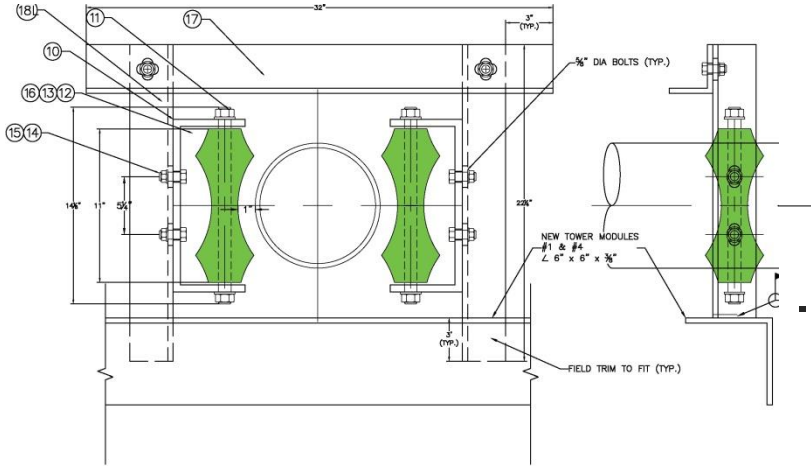
L 3" x J" x ....
L 3" x J" x -

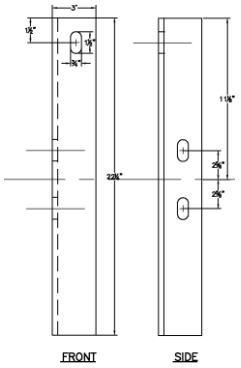
- Bill. OF IMTERI,II.S Mt,(U.E PER ONE ASSEMBLED UNIT
- 9L IS OPPOSITE OF 9R

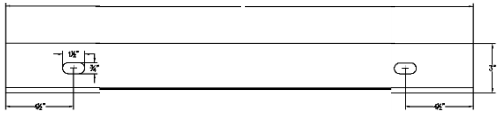
@# – ANG LE SLOTIED HOLE DETAIL

@ ;,,'IPE ROLLER GUIDE

1. .A36 STEEL MEMBERS TO BE HOT DIPPED GALVANIZED IN SHOP PRIOR TO ASSEMBLY
2. BEFORE ASSEMBLY OF STAINLESS STEEL AXLE TO STAINLESS STEEL SLEEVE ADD AXLE GREASE
3. FIELD WELD BEARING BAR AND BASE PLATE, THEN ADD GALVONOX AFTER COMPLETION OF WELD
4. ENTIRE PIPE SUPPORT AFTER ASSEMBLY MAYBE COATED SAME AS PIPELINE; CONTRACTOR'S OPTION







@# – ANG LE SLOTIED HOLE DETAIL

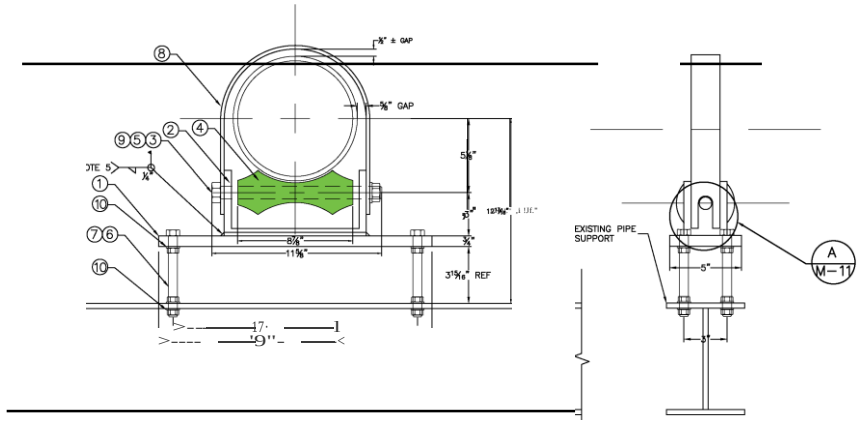
nEM	QIY	Tifil	PART NUMBER	DESCRIPTION	LENCTI-1	MATERIAL
10	2	BEARING	BS 4024	▮▮▮▮▮ " x 2"		A.36 STEEL GALVANIZED
	2	ttttttt	BR-0820	ROUND BAR 7 " DIA TBE 11''	1'''' 1N.	J16 STAINLESS STEEL
▮▮	2	ROLI.ER	10H	UCTIVE PIPE ROLER 11"	11'. IN.	J STAINLESS STEEL SLEEVE
13	4	,ur	785G 0008			
14	6	SIUD	755G-0006			
15	6	,ur	785G 0006			
16	4	WASHER	795G-0008			
17	1	N>GCE		▮x ▬ ▮	2 1N.	A.36 STEEL GALVANIZED
18R	1	N>GCE		L " X " X ▮▮.▪	2m 1N.	A.36 STEEL GALVANIZED
18L	1	▮▮		L " X " X -▮▪"	2m 1N.	A36 STEEL GALVANIZED

- Bill. OF MATERIALS ABOVE PER ONE ASSEMBLED UNIT
- 18L IS OPPOSITE OF 18R

@#18R – ANGLE SLOTIED HOLE DETAIL

M-1 ''''

@!.2V::FR ROLLER PIPE GUIDE



, DJUSTABLE PIPE ROLLER STAND

	QIY				LENGTH	
		BEARING	BS-6040 BS-4024 BR-0820		19 1N. " IN.	A JS STEEL GALVANIZED A36 STEEL GALVANIZED 316 STAJNLESS STEEL POLYURETHANE. 316 STAJNLESS STEEL SLEEVE
				R 8"'		
5	2		78SC-0008			STAINLESS STEEL
7		SND	75SC-0006		IN.	STAINLESS STEEL
8		STRW	78SC-0806			STAINLESS STEEL
9	2	WASHER	BQ-2020 7950-0008			A36 STEEL GALVANIZED STAINLESS STEEL
	8	WASHER				STAINLESS STEEL

• BILL OF IMTERIALS ABOVE PER ONE ASSEMBLED UNIT

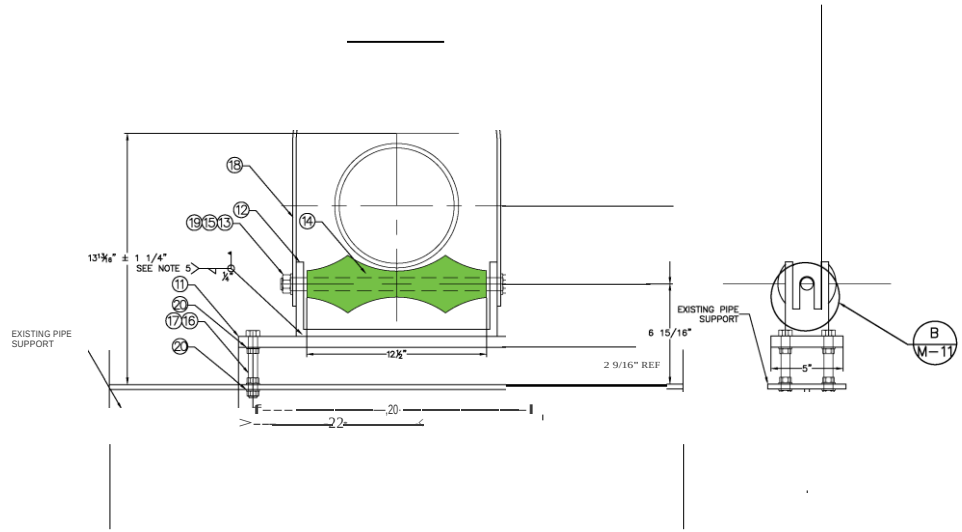
1/16"

1 3/4"

1"

@ OT DETAIL

1. MAX RECOMMENDED LOAD = 1,400LBF
2. PIPE STRAPS TO BE COATED WITH POLYOUFIN SHRINK COATING
J. A36 STEEL MEMBERS TO BE HOT DIPPED GALVANIZED IN SHOP PRIOR TO ASSEMBLY
4. BEFORE ASSEMBLY OF STAINLESS STEEL AXLE TO STAINLESS STEEL SLEEVE ADD AXLE GREASE
5. FIELD WELD BEARING BAR AND BASE PLATE, THEN ADD GALVANOX AFTER COMPLETION OF WELD



8" ADJUSTABLE PIPE ROLLER STAND WITH LATERAL MOVEMENT

-11 sc,J.E: 1:4

	QIY.	TmE	PART NUMBER		
		BEARING	BS-6040 BS-4024 BR-0820		"36 STEEL <W.VANIZED A J6 STEEL G.11 VANIZED J18 STAINLESS STEEL POLYURETHANE. 316
					STAINLESS STEEL SLEEVE
			78 SC-0008		STAINLESS STEEL
		SND	75.SC-0006		STAINLESS STEEL
			78.SC-0806		STAINLESS STEEL
		STIW.	BS-2020		A36 STEEL GOVANIZEO
		WASHER	79SC-0800		STAINLESS STEEL

• BILL OI MATERIALS ABOVE PER ONE ASSEMBLED UNIT

1/16"

1 J 4"

1 1/8"

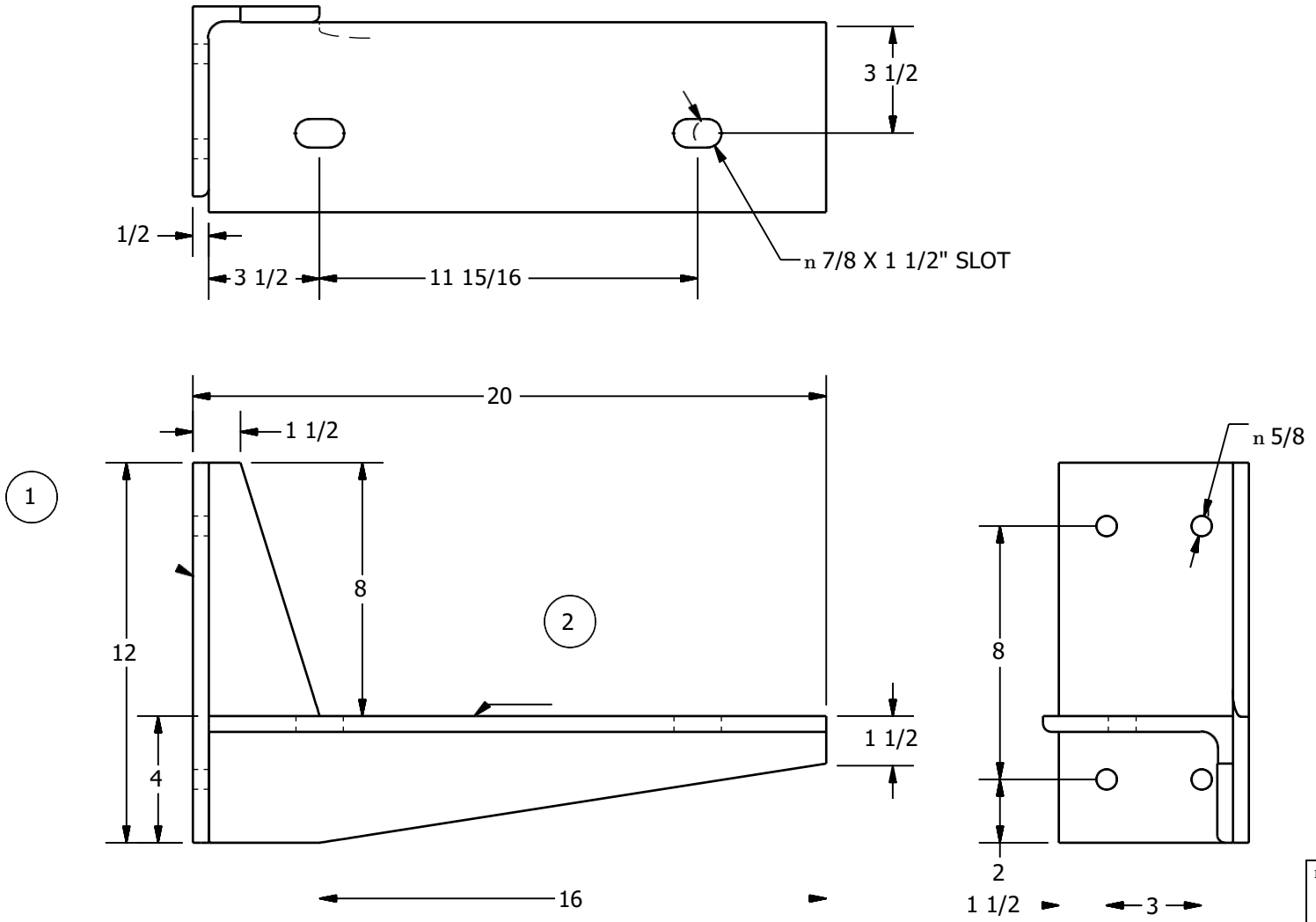
@ OT DETAIL

APPROVED BY:	
DATE:	

ITEM	QTY	PART NUMBER	DESCRIPTION	LENGTH	WEIGHT EA.
1	1	SPECIAL	Angle Steel 6" X 4" X 1/2"	12 in	14.71
2	1	SPECIAL	Angle Steel 6" X 4" X 1/2"	19 1/2 in	23.28

SPECIAL ITEMS ARE NON-RETURNABLE

TOTAL WGT PER UNIT = 38.00 lbmass



DESCRIPTION	FINISH	UNIT QTY.
SPECIAL ANGLE BRACKET 6" X 4" X 1/2" ANGLE	H.D.G.	5

	PROJECT
LINN BROWN	

DRAWN BY	DATE	SCALE	ORDER NO.	DRAWING NO.	SHEET	REV.	TAG
AJM	10/22/2008	3/16"=1"	001738	AngleBracket	1 OF 1	0	

LB&A, INC
LINN BROWN & ASSOCIATES
A UTILITY SERVICE COMPANY