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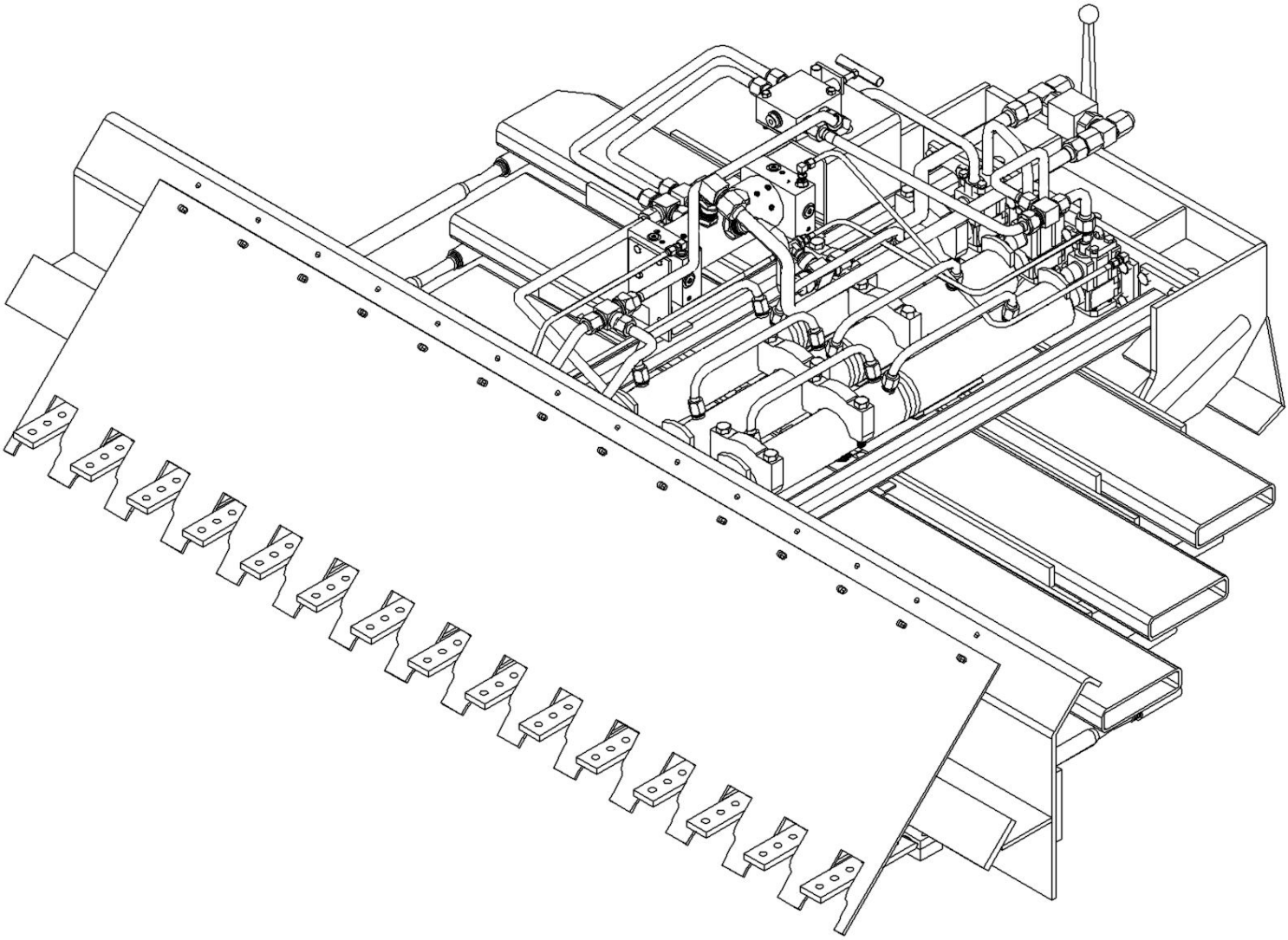
LP-III INSTALLATION MANUAL



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Section 1: Introduction

This manual is a guide for installing your new KEITH® LeakProof (LP III) drive system, coinciding with a new trailer construction. It is based upon units with 12 or 15 slats. Although procedures for a retrofit installation of an LP III will not be specifically addressed, most of the procedures will basically be the same with certain obvious modifications being necessary.

The installation of a LP III drive unit will take about twice as long as it does for the installation of a standard KEITH® Running Floor II® drive unit. Expect the first LP III drive unit that you install to take approximately three times longer than a standard drive. Welding skill will also dictate the installation time. Be aware that the use of Sikaflex for sealing the sub-deck and drive frame will make the installation very messy.

Every LP III drive unit is custom designed for each trailer. It is assumed that you have already consulted with the engineering department of KEITH Mfg. Co. Doing so will ensure that you have received the correct drive unit package for your trailer, along with any special instructions that may relate to your specific installation. Issues such as kingpin or drive structure modifications, method of connecting the water dam to the trailer wall and the style of lower shield required should have already been determined.

The engineering department at KEITH Mfg. Co. will help you decide if your trailer will require a LP III drive unit only, or if you also need a kingpin assembly. Other options will also be discussed.
The engineer will need:

1. The inner and outer dimensions of your trailer (length and width).
2. Drawings containing the structural layout of the nose of the trailer including the kingpin location.
3. Details concerning the application, such as if the trailer will be top loaded or compactor loaded from the rear?

Warning:
Installing the *WALKING FLOOR*® system may require some alterations to your trailer. Changes made without the approval of the trailer manufacturer may void the trailer warranty.

Always use suitable eye and body protection when installing your KEITH® *WALKING FLOOR*® system.

Section 2: Preparations for Installation

These considerations need to be made before installation of the drive unit.

Installation of an LP III unit is easiest if it coincides with construction of the trailer. Although the order of trailer construction may vary, it is highly recommended that the drive unit itself is installed while there are no walls on the trailer. An overhead crane or equivalent is required for lifting the drive unit into place.

Begin by reading through this manual and familiarizing yourself with each step and procedure. Compare the drawings and special instructions with your trailer to make sure that they match. Try to plan ahead by visualizing what the end product will look like.

In addition to supplying the trailer itself, the customer is responsible for designing and supplying the upper shield, the structural tie-in of the drive unit to the front bulkhead, an access to the front of the drive unit for maintenance, baffle plates, side seals and trailer doors which are leak proof in the rear. (See drawings and related sections for more details).

Note that the drive unit will extend approximately 10” beyond the front bulkhead. An access hatch for the drive unit will need to be created above this. The hatch needs to be large enough for a person to climb inside to work on the drive unit. (See appendix for examples).

Keep in mind where the air and electrical lines will be located. Since the LP III drive unit sits on the kingpin plate, these lines cannot run through the kingpin assembly unless holes are cut through the water dam. This is acceptable, as long as the holes are cut *below* the sub-deck on the water dam. Consult with KEITH Mfg. Co. on the proposed location before any holes are cut to ensure that they will not interfere with any other operation.

Once the correct drive unit is selected for your trailer, you may need to modify the kingpin or trailer design to accommodate the drive.

Section 3: Drive Unit Installation

3.1 Basic LP III Drive Unit Components

3.1.1 LP III Drive Unit (See Figure #1)

Water Dam	The main force bearing member of the drive unit, also the front wall of the liquid tight section of the trailer.
Profile Plate	The sidewall of the drive frame.
Cylinder	The drive cylinders move the floor slats. The LP III has three cylinders (4” ID).
Cross-Drive	Three cross-drives allow the cylinders to be connected to multiple floor slats.
Drive Shoe	Connect the push rods to the cross-drives.
Push rod	The rod that travels through the water dam in order to connect the cross-drive to the floor slat.
Clevis Bar	Connects the push rod to the floor slat.
Slat	Slats are the moving portions of the floor.
Sub-Deck	The sub-deck is the leak resistant part of the flooring. The slats rides on top of bearings mounted to the sub-deck.
Rod Bushing & Jam Nut	The push rod goes through the rod bushing and jam nut that is attached to the water dam. It contains seals and wipers to maintain the water tightness of the water dam.
Lower shield	This shield extends from the top of the water dam to the sub-deck. It protects the clevis bar and slat connections.

3.1.2 LP Drive Unit with Kingpin Assembly (see Figure #2)

Kingpin and Plate	The LP III drive unit can be purchased with the kingpin already integrated in to the drive.
Water Dam	Plate for attaching the water dam to the trailer wall.
End Plate	(optional)

LP–III BASIC PARTS IDENTIFICATION

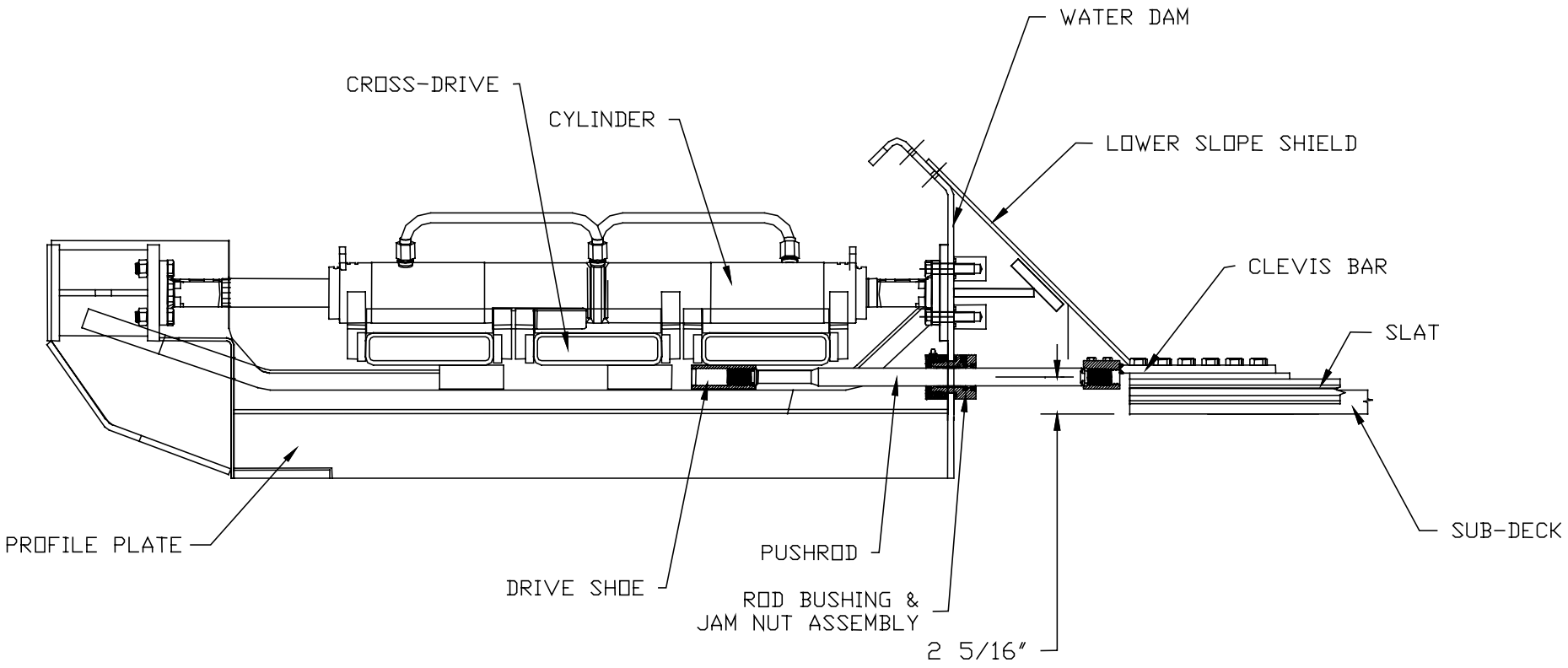


Figure 1

LP–III BASIC PARTS IDENTIFICATION WITH KINGPIN ASSEMBLY

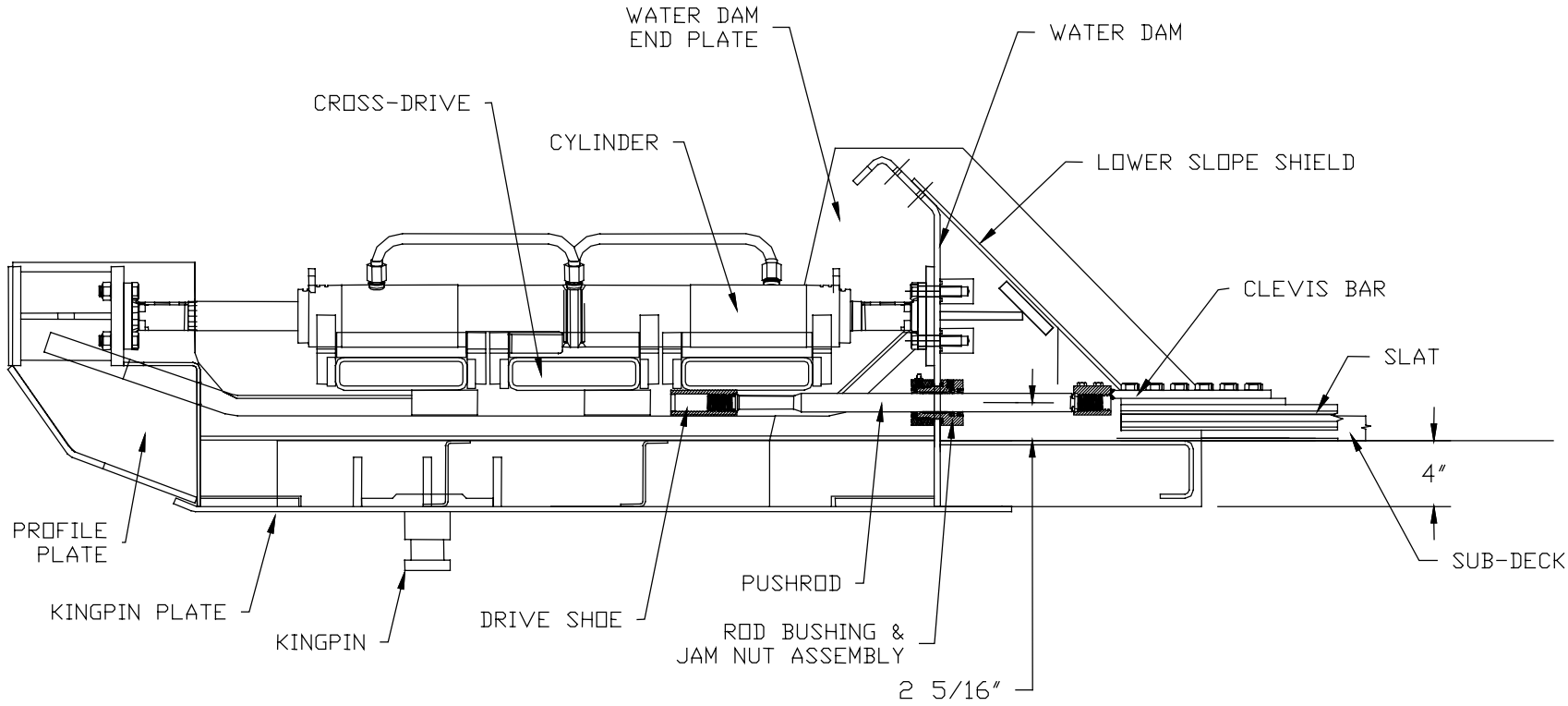


Figure 2

3.2 Drive Unit Installation

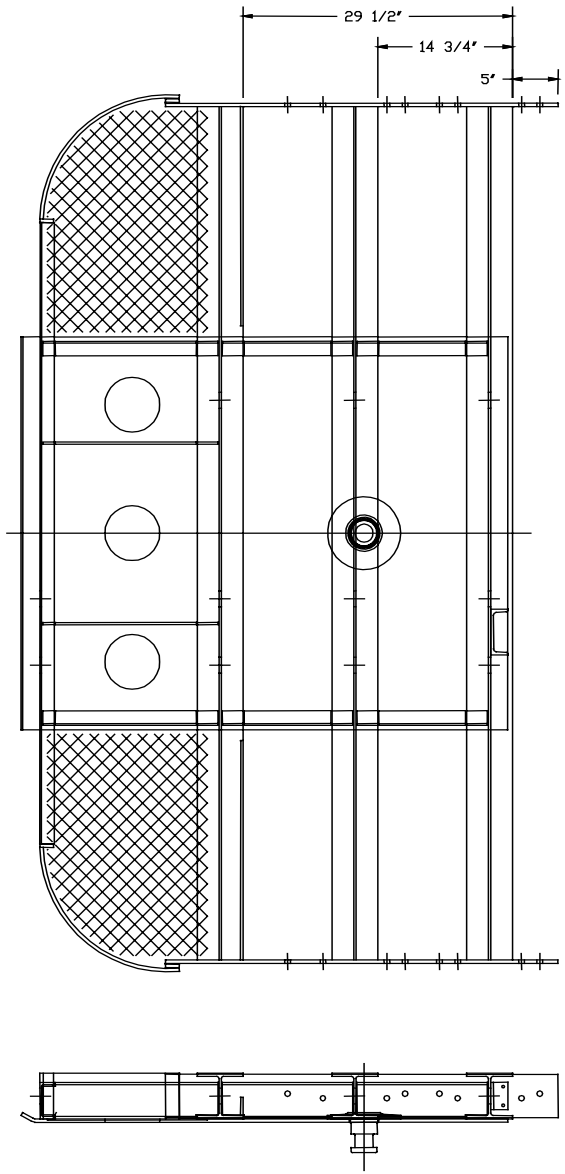
Drive unit installation is most easily accomplished if there are no walls on the trailer. It is important to mount the drive unit square and centered on the trailer frame, as the flooring slats and sub-deck are installed based upon the position of the drive unit.

First, make any modifications that are required to the kingpin assembly to accommodate the LP III drive unit, based upon consultation with the engineering department of KEITH Mfg. Co. Figure #3 shows an example of a kingpin assembly and possible modifications necessary to accommodate an LP III drive unit. Note that if one has chosen to attach the water dam to the trailer walls using end plates, the end plates should be welded on before placing the drive unit on the trailer.

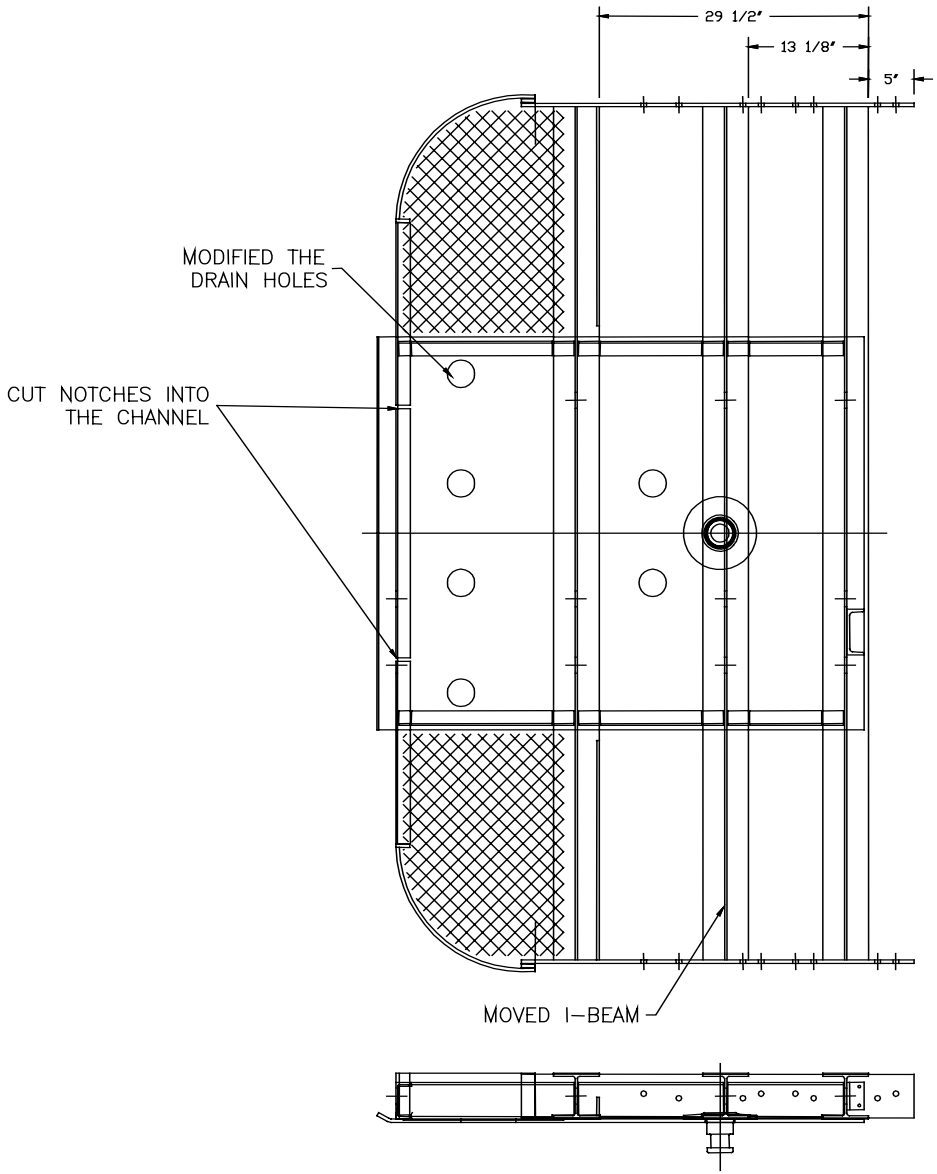
Begin the installation by marking the center of the ends of the drive unit and snapping a centerline down the trailer from end to end. (On a 15-slat drive unit, the #8 push rod is on the center of the drive). Place the drive unit on the front of the trailer frame with an overhead crane centering it on the trailer at the distance from the end of the trailer provided by KEITH Mfg. Co. Make sure that the sides of the trailer are square with the assembly by comparing the distances between the corners of the trailer and each corner of the drive unit. Check to make sure that the drive unit is sitting with the push rods parallel to the top surface of the cross members.

Weld the drive unit to the kingpin assembly. KEITH Mfg. Co. will supply a detailed drawing indicating which surfaces to weld for each individual installation. A hydraulic power unit may have to be attached to the drive in order to cycle the cross drives and gain access to some welding locations. Figure #4 shows a typical welding layout.

Installing a drive unit with a kingpin supplied by KEITH Mfg. Co. is much faster and easier than installing a drive on a trailer with an existing kingpin.



ORIGINAL
KINGPIN LAYOUT



MODIFIED
KINGPIN LAYOUT

Figure 3

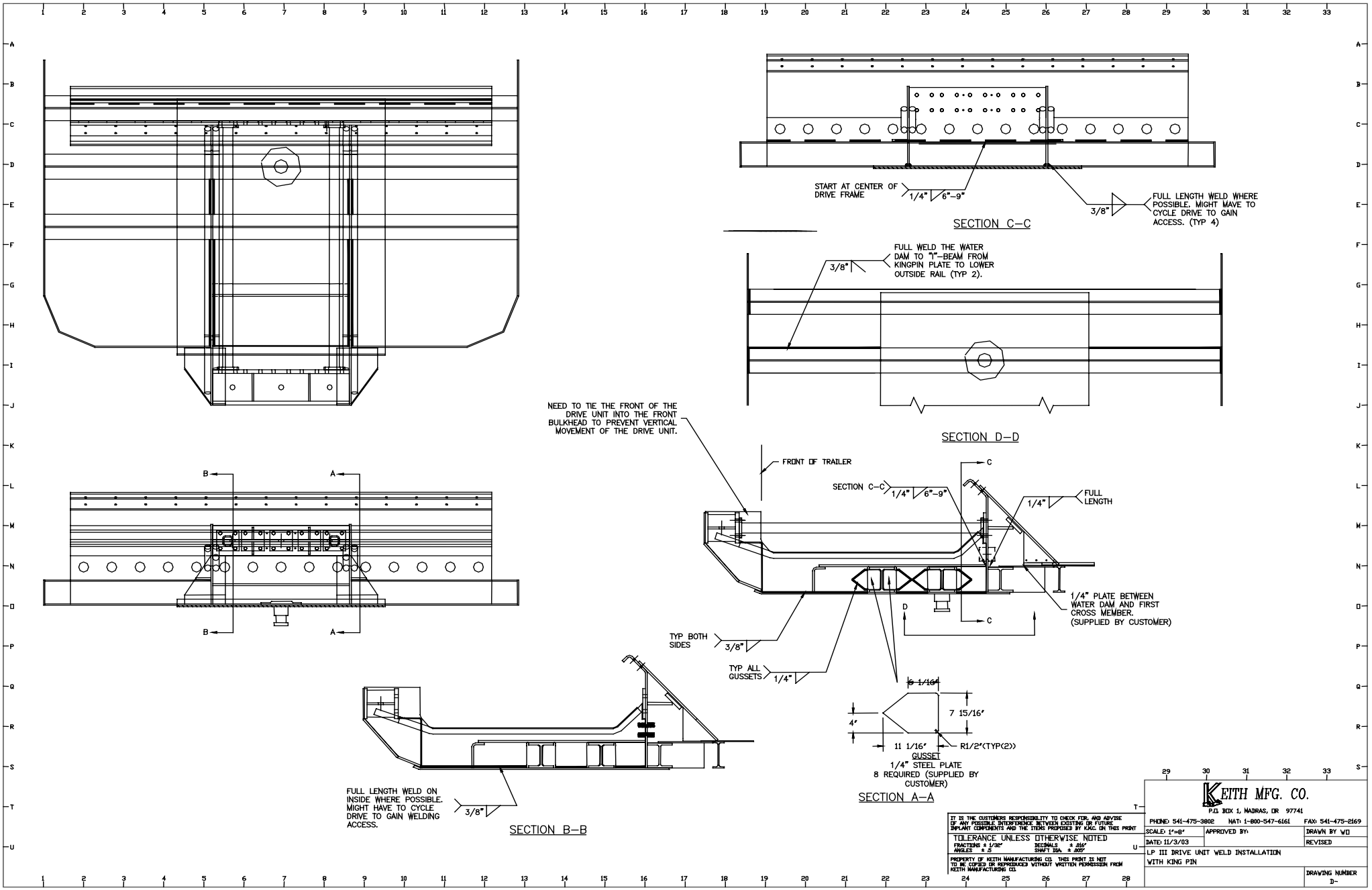

START AT CENTER OF DRIVE FRAME
1/4" 6"-9"
3/8"
FULL LENGTH WELD WHERE POSSIBLE. MIGHT HAVE TO CYCLE DRIVE TO GAIN ACCESS. (TYP 4)
SECTION C-C
FULL WELD THE WATER DAM TO "I"-BEAM FROM KINGPIN PLATE TO LOWER OUTSIDE RAIL (TYP 2).
3/8"
SECTION D-D
NEED TO TIE THE FRONT OF THE DRIVE UNIT INTO THE FRONT BULKHEAD TO PREVENT VERTICAL MOVEMENT OF THE DRIVE UNIT.
FRONT OF TRAILER
SECTION C-C
1/4" 6"-9"
1/4"
FULL LENGTH
1/4" PLATE BETWEEN WATER DAM AND FIRST CROSS MEMBER. (SUPPLIED BY CUSTOMER)
TYP BOTH SIDES
3/8"
TYP ALL GUSSETS
1/4"
6 1/16"
7 15/16"
4"
11 1/16"
R1/2"(TYP(2))
GUSSET
1/4" STEEL PLATE
8 REQUIRED (SUPPLIED BY CUSTOMER)
SECTION A-A
FULL LENGTH WELD ON INSIDE WHERE POSSIBLE. MIGHT HAVE TO CYCLE DRIVE TO GAIN WELDING ACCESS.
3/8"
SECTION B-B
KEITH MFG. CO.
P.O. BOX 1, MADRAS, OR 97741
PHONE: 541-475-3802 NAT: 1-800-547-6161 FAX: 541-475-2169
SCALE: 1"=8"
APPROVED BY:
DRAWN BY WD
DATE: 11/3/03
REVISED
LP III DRIVE UNIT WELD INSTALLATION WITH KING PIN
DRAWING NUMBER D-
IT IS THE CUSTOMERS RESPONSIBILITY TO CHECK FOR, AND ADVISE OF ANY POSSIBLE INTERFERENCE BETWEEN EXISTING OR FUTURE IMPLANT COMPONENTS AND THE ITEMS PROPOSED BY KMC ON THIS PRINT
TOLERANCE UNLESS OTHERWISE NOTED
FRACTIONS ± 1/32" DECIMALS .X ±.06" ANGLES ± .5 SHAFT DIA. ± .005"
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Figure 4

3.3 Securing the Drive to the Front Bulkhead

The front of the drive unit must be structurally connected to the bulkhead, becoming part of the wall when it is constructed. It is critical to fasten the drive unit to the front of the bulkhead securely. When the drive unit cycles back and forth, it causes the front of the drive unit to flex up and down. As the load in the trailer increases, the vertical flexion forces that need to be contained also increase. If the drive unit is not attached to the front bulkhead securely, it may damage the trailer walls or the frame.
The drive unit could produce up to 43,736 lb of vertical force (either up or down) into the front bulkhead. (See appendix).

One of many possible options is to weld steel structural members vertically to each side of the drive unit. These, in turn, are welded to one or more horizontal structural members that extend all the way across the front of the bulkhead inside the wall. These structural members can either be welded or bolted to the structural frame in the bulkhead to distribute the forces. (See figure #5 and the appendix for examples)

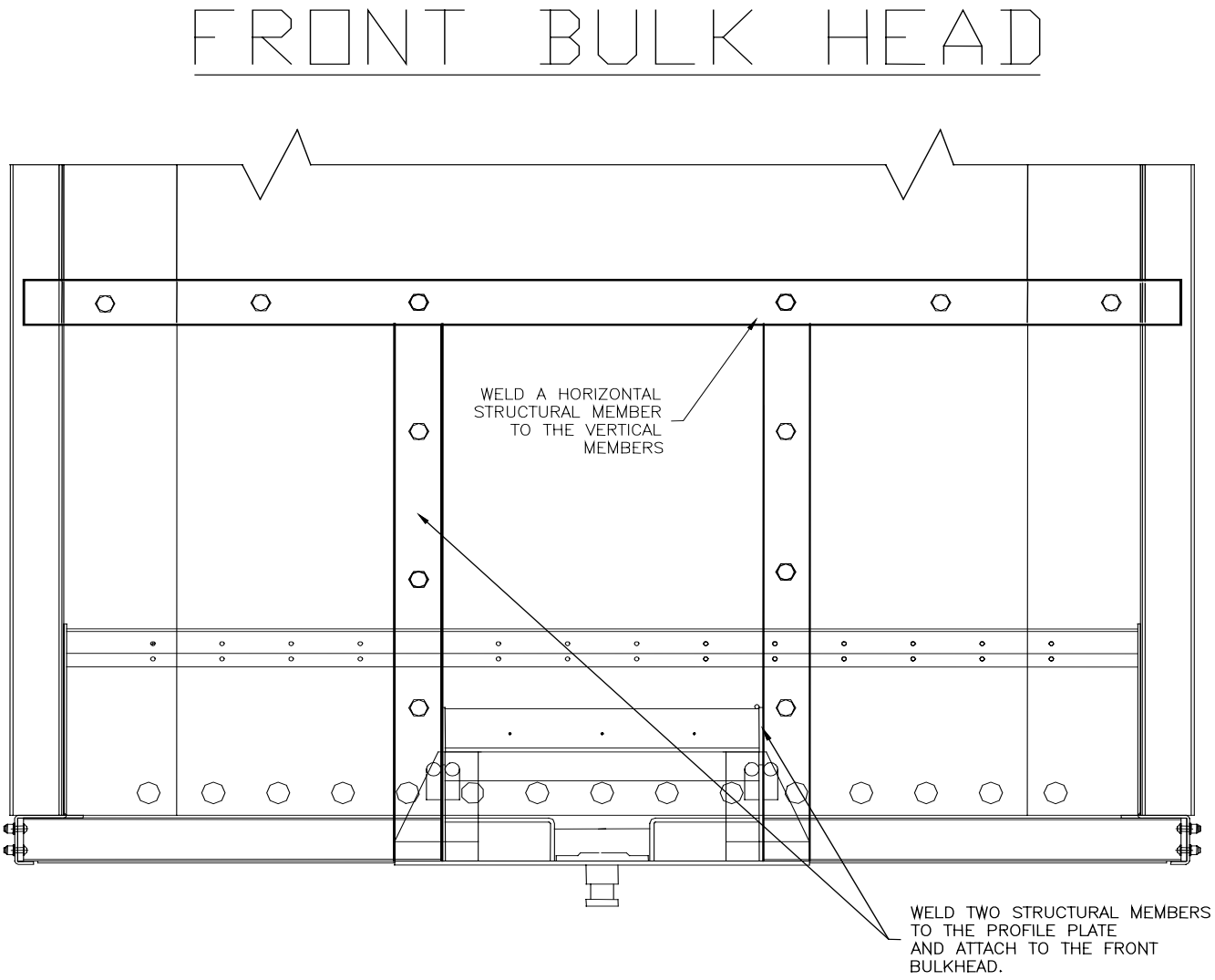


Figure 5

3.4 Securing the Water Dam to the Trailer Walls

After the walls are installed on the trailer, the water dam needs to be securely fastened to the inside of the walls. This is one of the most important steps in the installation process, as the water dam is the main load-bearing member in the drive unit. There are some options for fastening the water dam to the trailer walls. (See figure #6)

The most preferred option is to weld end plates perpendicular to the ends of the water dam and then bolt the end plates to the side of the trailer, because it distributes the load evenly over a large surface area and provides some play between the wall and drive. (Note that it is recommended that end plates be welded to the water dam before installing the drive in the trailer). Other options include welding angle iron to the ends of the water dam and bolting the angle iron to the trailer wall or bolting the water dam to one side of the trailer and welding it to the other. (Note that it is recommended that at least one joint is bolted). In aluminum trailers, insert some type of non-conductive barrier between aluminum and steel interfaces to prevent corrosion.

Note that these are only some options for attaching the water dam to the trailer walls. It does not rule out other possibilities.

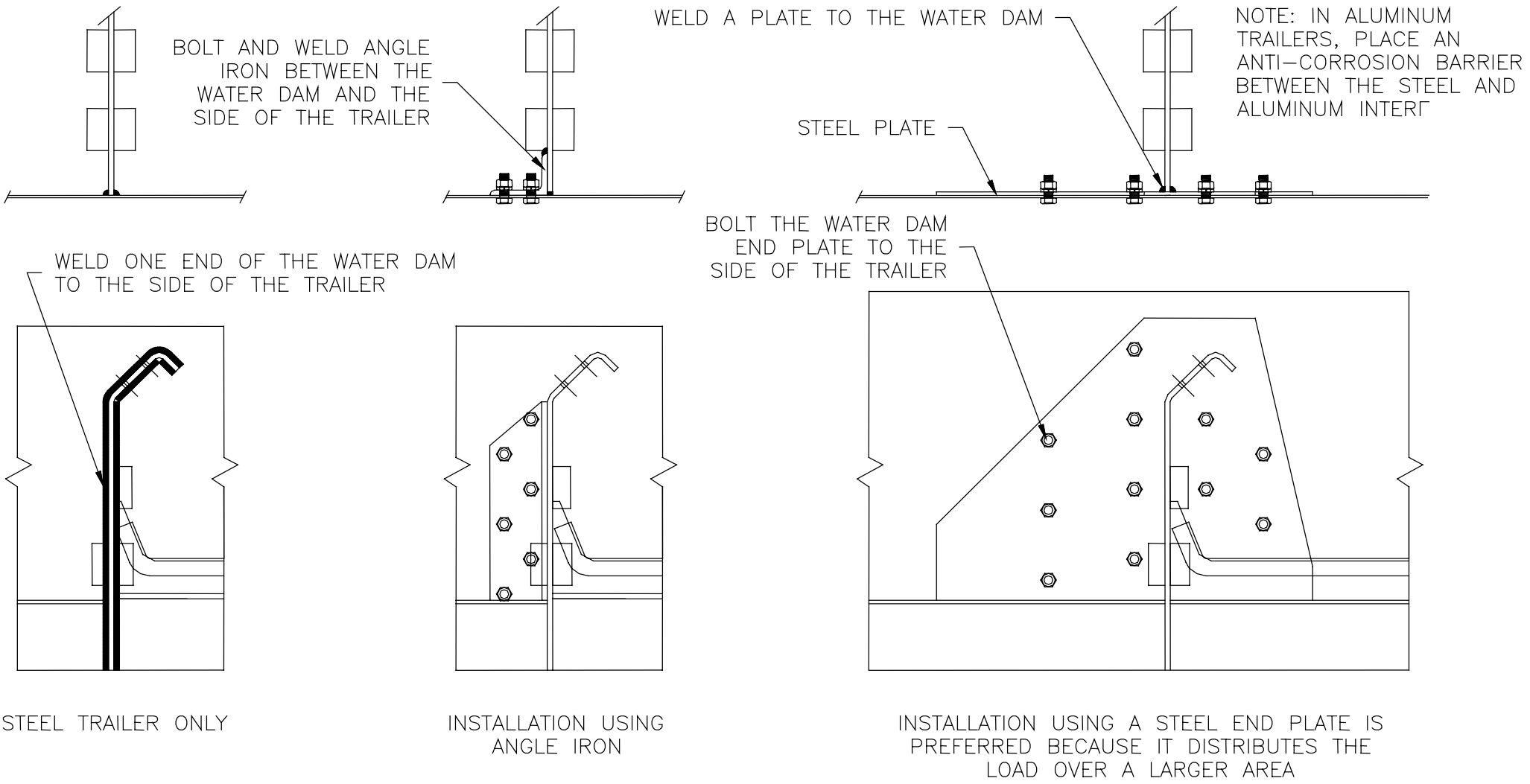

BOLT AND WELD ANGLE IRON BETWEEN THE WATER DAM AND THE SIDE OF THE TRAILER
WELD A PLATE TO THE WATER DAM
NOTE: IN ALUMINUM TRAILERS, PLACE AN ANTI–CORROSION BARRIER BETWEEN THE STEEL AND ALUMINUM INTERΓ
STEEL PLATE
BOLT THE WATER DAM END PLATE TO THE SIDE OF THE TRAILER
WELD ONE END OF THE WATER DAM TO THE SIDE OF THE TRAILER
STEEL TRAILER ONLY
INSTALLATION USING ANGLE IRON
INSTALLATION USING A STEEL END PLATE IS PREFERRED BECAUSE IT DISTRIBUTES THE LOAD OVER A LARGER AREA

Figure 6

Section 4: Sub-deck Installation

4.1 Installing the Baffle plates

The section of the trailer between the water dam and the next cross member needs to be fitted with an aluminum baffle plate to mount the sub-deck to. The section of the trailer between the last cross member and the rear of the trailer also needs to have a baffle plate. However, it can either be steel or aluminum, corresponding with trailer construction. Note that these baffle plates need to be single sheets that extend across the entire width of the trailer. (See figure #7)

In the front baffle plate installation, the distance between the center of the push-rods and the surface that the sub-deck will sit on is a critical dimension. This dimension must be maintained all the way across the water dam. (2 5/16”)

In trailers with steel cross members, weld a ¼” steel sub-plate between the water dam and the first cross member, leaving enough room to attach an aluminum baffle plate and corrosion barrier on top to maintains the critical tolerance mentioned above. Cut an aluminum baffle plate so that the edge will be approximately ½” from the face of the water dam. Insert an anti-corrosion barrier between the steel and aluminum. Apply a generous bead of Sikaflex all the way across the end of the aluminum baffle plate and down the sides before placing it on top of the steel. Attach the baffle plate to the steel plate by drilling holes and placing ¼” self-tapping screws every 5 inches. After pre-drilling, put Sikaflex in the hole, then screw in the self-tapping screw, finally covering the screw head with more Sikaflex to ensure that it will not leak. Avoid applying Sikaflex in areas that will require welding when installing the sub-deck.

If the cross members are aluminum, then weld angle iron (3”x3”x1/4”) across the entire face of the water dam so that the aluminum baffle plate can be screwed to it. Once again, this angle iron must be welded so that the top of the aluminum baffle plate sitting on top of the angle iron will maintain the correct spacing between it and the push rods. Place an anti-corrosion barrier between the steel and aluminum and proceed to attach the aluminum baffle plate with ¼” self-tapping screws as described above. (See figure 8)

Install a baffle plate, flush between the top of the last cross member and the rear of the trailer with the same basic methods described above.

Tools and Materials Required:

Tape measure, welder, drill/ #1 & #2 drill bits, screw gun/ 7/16” nut driver bit ¼”-20 self tapping screws, Sikaflex, baffle plates (supplied by customer), corrosion resistant barrier

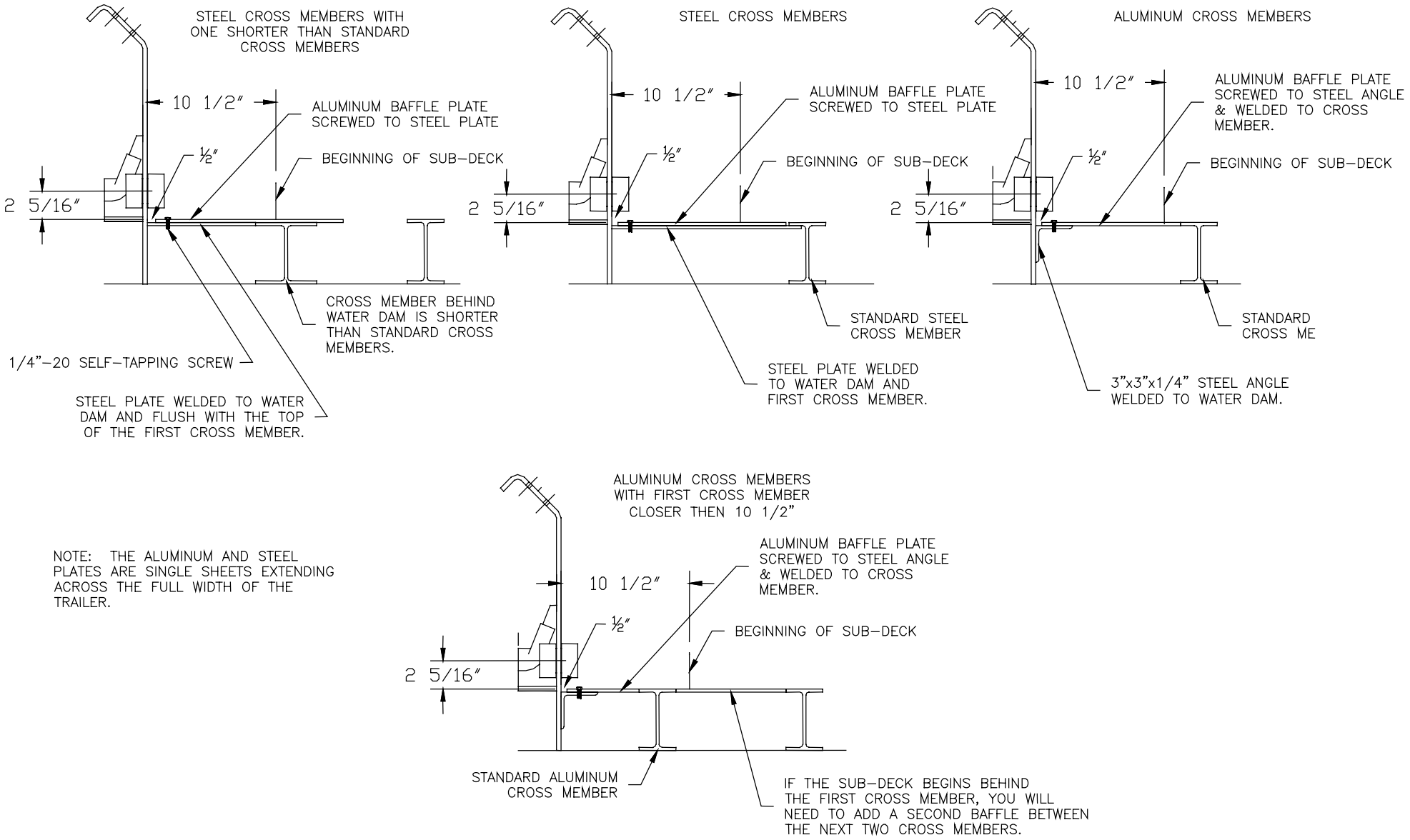

STEEL CROSS MEMBERS WITH ONE SHORTER THAN STANDARD CROSS MEMBERS
10 1/2″
ALUMINUM BAFFLE PLATE SCREWED TO STEEL PLATE
½″
BEGINNING OF SUB–DECK
2 5/16″
CROSS MEMBER BEHIND WATER DAM IS SHORTER THAN STANDARD CROSS MEMBERS.
1/4"–20 SELF–TAPPING SCREW
STEEL PLATE WELDED TO WATER DAM AND FLUSH WITH THE TOP OF THE FIRST CROSS MEMBER.
STEEL CROSS MEMBERS
10 1/2″
ALUMINUM BAFFLE PLATE SCREWED TO STEEL PLATE
½″
BEGINNING OF SUB–DECK
2 5/16″
STANDARD STEEL CROSS MEMBER
STEEL PLATE WELDED TO WATER DAM AND FIRST CROSS MEMBER.
ALUMINUM CROSS MEMBERS
10 1/2″
ALUMINUM BAFFLE PLATE SCREWED TO STEEL ANGLE & WELDED TO CROSS MEMBER.
½″
BEGINNING OF SUB–DECK
2 5/16″
STANDARD CROSS ME
3"x3"x1/4" STEEL ANGLE WELDED TO WATER DAM.
NOTE: THE ALUMINUM AND STEEL PLATES ARE SINGLE SHEETS EXTENDING ACROSS THE FULL WIDTH OF THE TRAILER.
ALUMINUM CROSS MEMBERS WITH FIRST CROSS MEMBER CLOSER THEN 10 1/2"
10 1/2″
ALUMINUM BAFFLE PLATE SCREWED TO STEEL ANGLE & WELDED TO CROSS MEMBER.
½″
BEGINNING OF SUB–DECK
2 5/16″
STANDARD ALUMINUM CROSS MEMBER
IF THE SUB–DECK BEGINS BEHIND THE FIRST CROSS MEMBER, YOU WILL NEED TO ADD A SECOND BAFFLE BETWEEN THE NEXT TWO CROSS MEMBERS.

Figure 7

4.2 Installing the Sub-floor

Snap a line across the trailer on the aluminum baffle plate 10 ½" from and parallel to the water dam. Then snap the centerline of the trailer between the water dam and the center of the rear of the trailer. Snap parallel lines 5 5/8" to the left and right of the trailer centerline. Continue snapping parallel lines down the trailer at 11 ¼" intervals until the edge of the trailer is reached.

Slide two pieces of sub-deck together with the joint along the center of the trailer and one end along the line marked 10 ½" from the water dam. (Note that if the sub-deck is closer than 10 ½" to the water dam the clevis bar will strike it during normal operation). Check to make sure that the notches located in the center of the troughs of the sub-deck line up with lines marked 5 5/8" from the centerline. In addition, the distance from the trailer wall to the sub-deck should be compared in several locations on both sides to ensure that the sub-deck is not bowed in the middle. (This can also be accomplished by running a string line down the edge of one of the troughs in the sub-deck). After the sub-deck has been lined up correctly, clamp it down.

Fasten the sub-deck to the cross-members, working from the water-dam to the end of the trailer. If the cross members are aluminum, weld the sub-deck from underneath the trailer where possible and screw the sub-deck down when welding is not possible, as indicated in Figure 9. In trailers with steel cross-members, the sub-deck must be screwed down.

Use the following procedure for screwing down the sub-deck:

1. Pre drill with a #1 or #2 drill bit (see what works best).
2. Fill the hole with Sikaflex.
3. Screw in the self-tapping screw.
4. Cover the screw head with Sikaflex.
5. Place screws on both sides of the web of each cross-member.

Once the first two pieces of sub-deck have been completely installed, continue installing sections one at a time, working from the center out. Each slat should be laid out 11 ¼" from centerline to centerline. The edge of the last piece of sub-deck may need to be trimmed to match the wall frame before it can be installed. Note that each push rod should line up with the center of a slat joint or trough, if it has been laid out correctly.

Tools and Materials Required:
Welder, chalk-line, string, tape measure, clamps, drill / #1 &#2 drill bits, screw gun / 7/16" nut driver bit, caulking gun, !/4"-20 self-tapping screws, Sikaflex

4.2.3 Installing the Side Seals

After the sub-deck has been fastened to the cross-members, side seals should be installed along each inside corner of the trailer, leaving a minimum of 3" between the edge of the outside sub-deck trough and the side seal. Install it in such a way that the corners of the trailer will be leak proof to at least 12 inches above the sub-deck. (See figure 11). Note that if there is less than 3" of clearance between the edge of the sub-deck and the side-seal, debris may wedge in between them and not clear out properly.

NOTE: WELD THE SUB–DECK TO CROSS MEMBERS WHENEVER IT IS POSSIBLE.

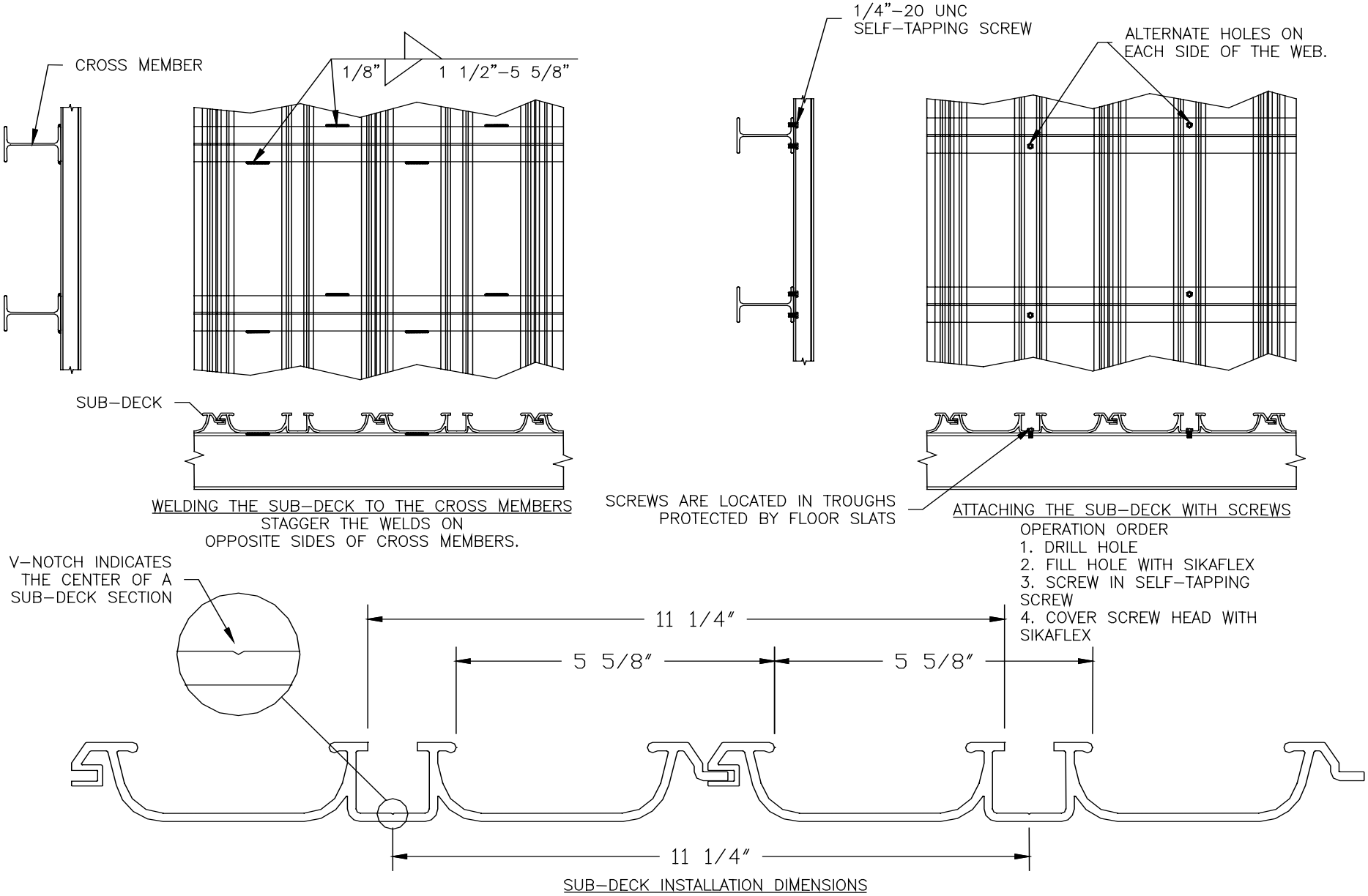
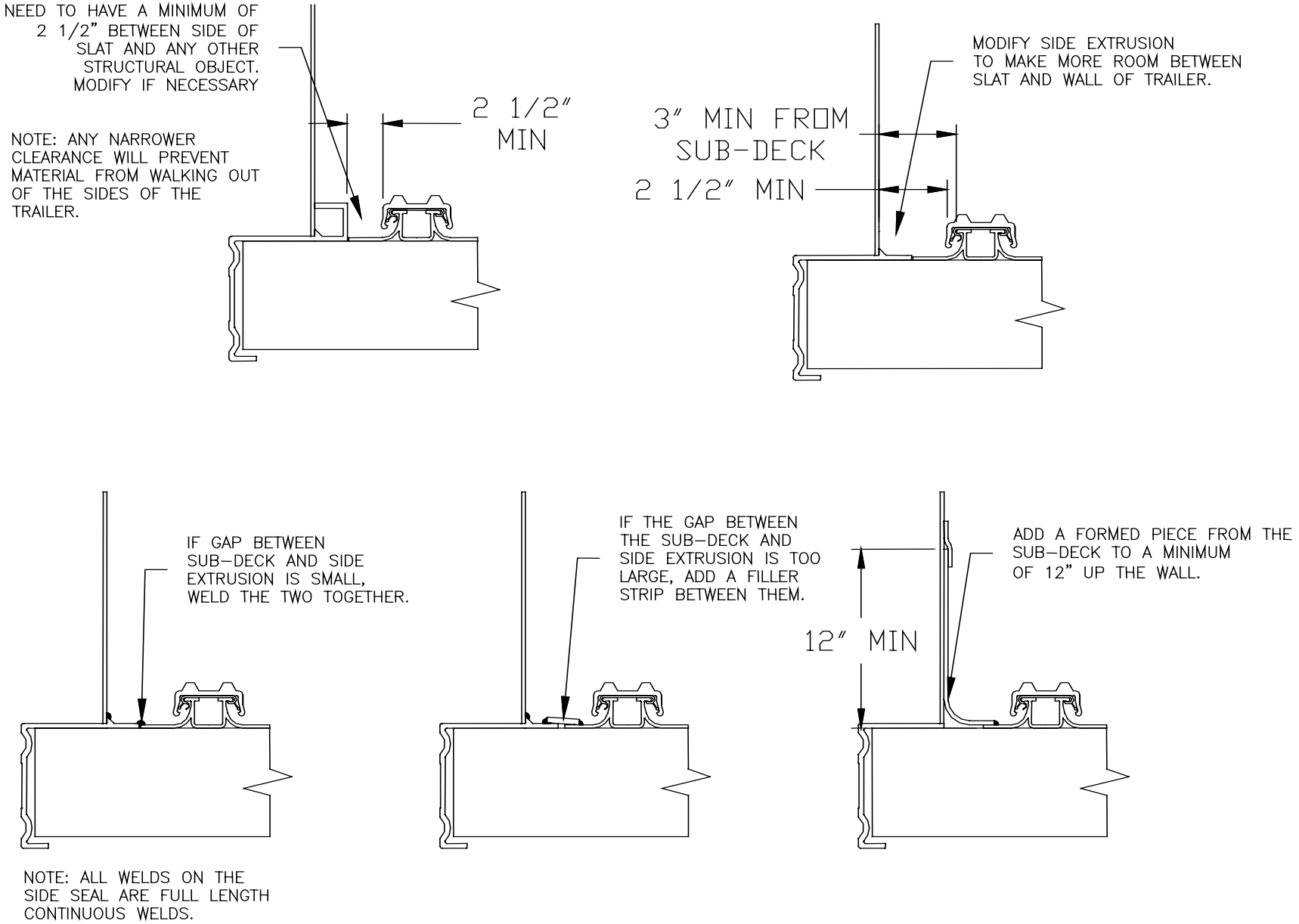


Figure 8



SIDE SEAL OPTIONS

Figure 9

4.2.2 Installing the Floor Plugs and Wear Bars

After the sides are sealed, install floor plugs at both ends of the sub-deck.
Slide a floor plug into the space beneath sub-deck joints, insetting the plug about 1/8” as a welding relief. (See Figure 10).

Weld all the way around the floor plugs where possible, being careful to fill in all holes and gaps. In locations where the floor plug sits on a steel baffle plate, seal the seam with Sikaflex after welding the plug into the sub-deck.

Once all the end plugs have been completed, install wear bars at the rear of the trailer. Cut one wear bar for each slat from the same material as the rear baffle plate. The material for these wear bars should be ½”x 1 ¼” flat bar with a 45 degree angle cut on one end. Make them as long as possible without interfering with door operation. Weld wear bars along the baffle plate centered behind each slat location.

Tools and Materials Required:
Welder, caulking gun,
Sikaflex, floor plugs, wear bars (supplied by customer)

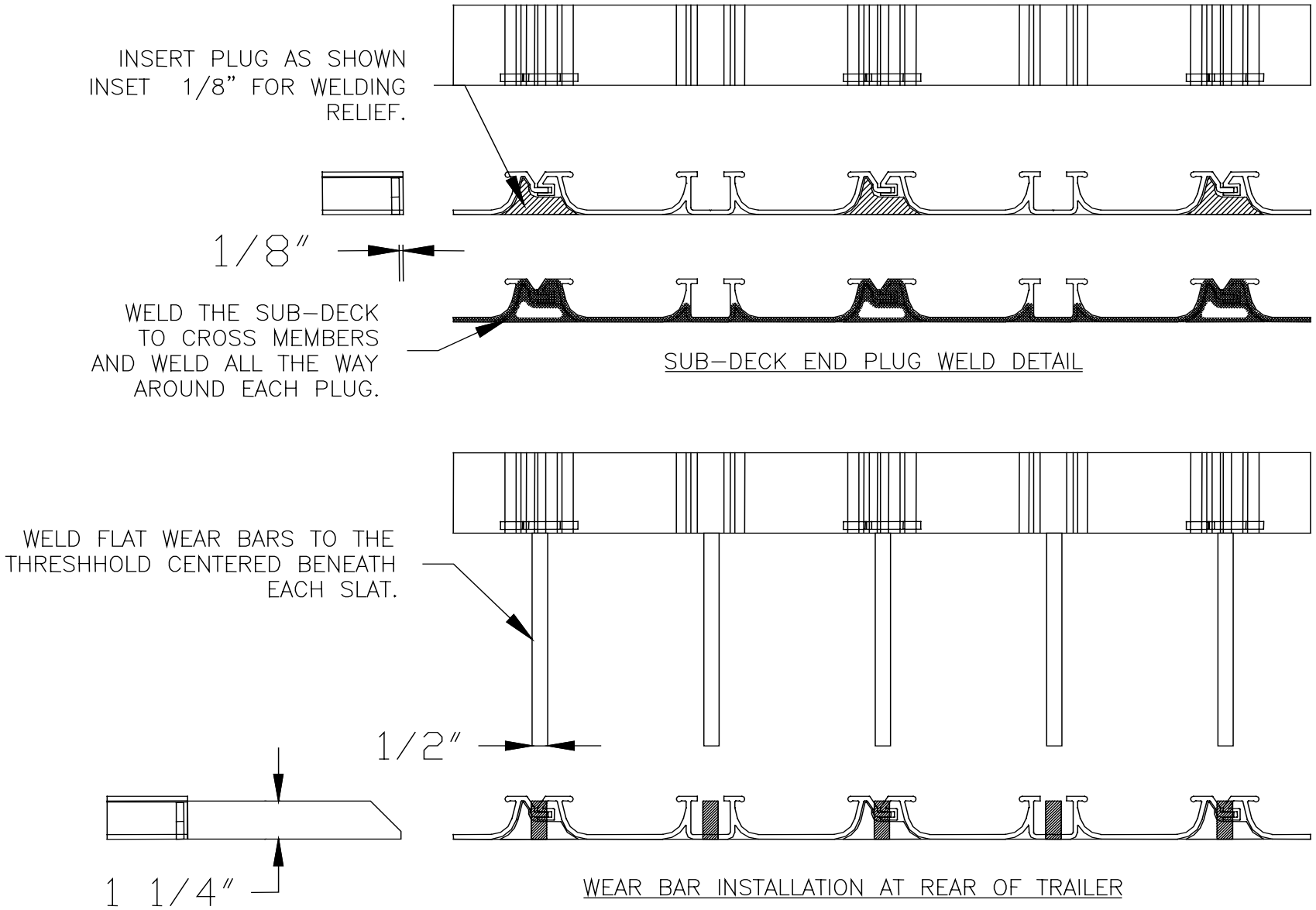
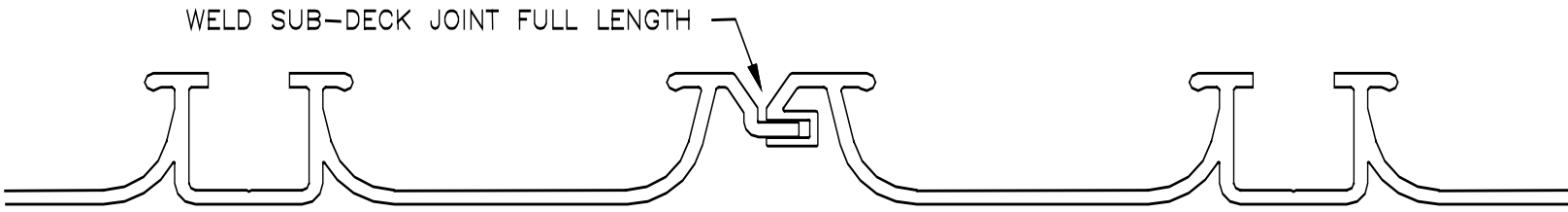

INSERT PLUG AS SHOWN
INSET 1/8" FOR WELDING
RELIEF.
1/8"
WELD THE SUB-DECK
TO CROSS MEMBERS
AND WELD ALL THE WAY
AROUND EACH PLUG.
SUB-DECK END PLUG WELD DETAIL
WELD FLAT WEAR BARS TO THE
THRESHHOLD CENTERED BENEATH
EACH SLAT.
1/2"
1 1/4"
WEAR BAR INSTALLATION AT REAR OF TRAILER

Figure 10

4.2.3 Welding the sub-deck joints

After the floor plug and wear bar installations have been completed, each joint between the sub-deck sections needs to be welded together. (For those who may have deviated from the installation order above, it is recommended that the trailer walls be attached before beginning this procedure.)

Weld each joint the full length of the trailer beginning in the center of the trailer and working toward the ends. Have one person preheat the sub-deck while another person welds.



SUB–DECK WELD DETAIL

Figure 11

4.2.4 Making the Sub-deck Water Proof

This is the messiest portion of the installation. Wear clothes that can be thrown away when you are done. In order to make the sub-deck leak proof, caulk with Sikaflex any areas that could possibly leak.

Starting at the water dam, put a healthy amount of Sikaflex on all of the exposed joints and seams, including the welded seams, in case there are any holes that may cause the floor to leak. (Snow White can be painted on welds as an alternative). Once the water dam and front of the sub-deck is completed, start on one side of the sub-deck and fill the joint between the mating sub-deck sections. Start at one end and work toward the rear, completing one seam before beginning the next one. After running the bead in the groove, go over it with a putty knife and make sure that the Sikaflex does not extend above the top of the sub-deck. If it does, it will interfere with the bearing strip, which is installed later.

After the sub-deck sections have been sealed, proceed to seal the rear of the trailer. Fill every hole, seam and joint.

Finally, carefully check the trailer to ensure that all the welds, seams, joints and bolts are covered with Sikaflex. Let the trailer sit long enough for the Sikaflex to dry according to the manufacturer's directions.

Tools and Materials Required:
Putty knife, caulking gun, Sikaflex 221 (approx. 12 cartridges)/ and Snow White (can be used on welds)

4.3 Water testing

After the Sikaflex has dried, clean the trailer out, removing any tools or debris. Lower the front end of the trailer, insert a hose into the rear of the empty trailer with the doors open and fill it up (**Do not overfill the trailer** –the water dam will only hold up to 12" of liquid). After the trailer is full, turn off the water and look for leaks. Mark any leaks found. Drain the trailer and dry it out. Fix the leaks by welding and/or applying Sikaflex as required. Let the Sikaflex dry before retesting.

Repeat the above process until there are no leaks.

Section 5: Bearing and Floor Installation

Do not install the bearings until the sub-deck has been water tested and is leak proof. If you install the bearing before testing and you find that the trailer leaks, you will have to remove the bearings in order to fix the leaks.

5.1 Installing the Bearings

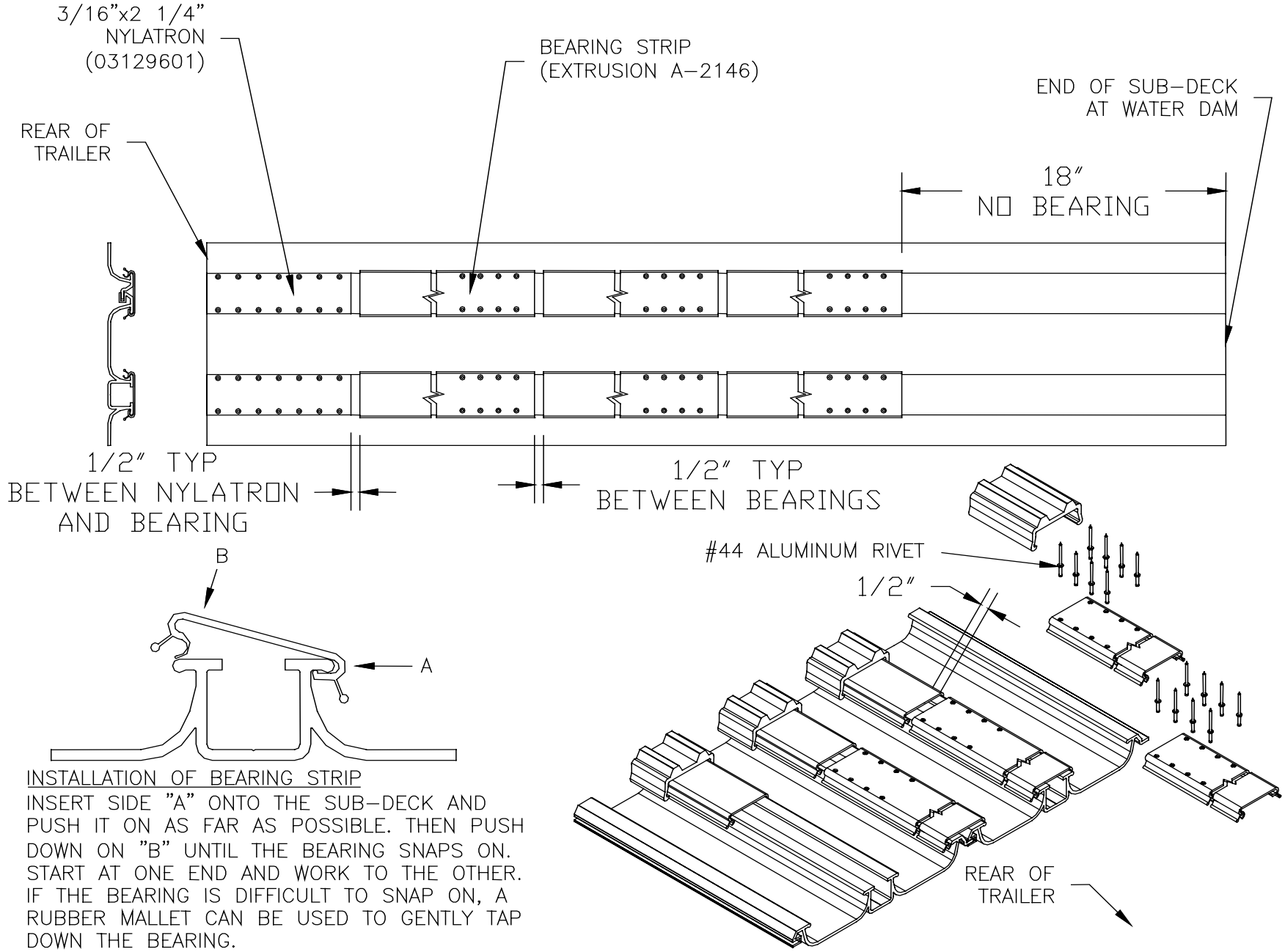
First, review Figure #12 on the layout of the bearings. Begin bearing installation at the rear of the trailer and work your way to the front of the trailer.

Install one 3/16" thick Nylatron bearing on each slat support at the rear of the trailer. Line it up flush with the end of the sub-deck, center it and clamp it down. Using the predrilled Nylatron bearing as a pattern, drill through the sub-deck with a 1/8" drill and install #44 aluminum rivets (14/bearing).

Measure ½" from the Nylatron bearing and snap down the first fourteen foot polyethylene bearing strip from this point. The pre-drilled holes should be toward the front of the trailer. To install the bearing, slide one end of the bearing on the sub-deck and snap the other side over the opposite lip. Refer to figure #12 for the correct side of the bearing to slide on first. Start at the rear end and work your way to the front. If needed, use a rubber mallet to gently tap the bearing onto the sub-deck. It is important to put the bearing in the correct location the first time, because the bearing is difficult to remove once it has been snapped onto the sub-deck. When the bearing is snapped on the sub-deck, drill and rivet it to the sub-deck, using the predrilled holes as a pattern.

Continue putting bearing strips down, remembering to leave a ½" gap between each strip, until the final strip for each slat (the number of bearing strips will vary depending upon the length of the trailer). The last bearing strip will need to be cut to fit. Measure the distance between the end of the last bearing and the end of the sub-deck. Subtract 18 ½" from that measurement. This is the length of the last bearing strip. Starting at the drill end of the bearing strip, measure the length of the bearing and cut to size. Install the bearing strip as above.

Tools and Materials Required:
rubber mallet, drill + 1/8" drill bits, rivet gun, tape measure, 9/16" & 3/4" sockets and rachet, torque wrench, hacksaw
#44 aluminum rivets, lock tight, 1 nylatron bearing/ slat (i.e. 12 or 15), 14' polyethylene bearing strips (varies with length of trailer).



INSTALLATION OF BEARING STRIP

INSERT SIDE "A" ONTO THE SUB–DECK AND PUSH IT ON AS FAR AS POSSIBLE. THEN PUSH DOWN ON "B" UNTIL THE BEARING SNAPS ON. START AT ONE END AND WORK TO THE OTHER. IF THE BEARING IS DIFFICULT TO SNAP ON, A RUBBER MALLET CAN BE USED TO GENTLY TAP DOWN THE BEARING.

Figure 12

5.2 Installing the Flooring

Before installing the floor slats, check to see that all the rivets are in the bearing strips and that the head of the rivets are either flush or below the top of the bearing strip. If the rivets protrude past the top of the bearing, it will cause wear on the bottom of the aluminum flooring.

Lay the flooring slats in the trailer with each slat centered on bearing strips. Install the end of the slat, which is pre-drilled and tapped for the clevis bar, six inches from the water dam. Snap the slat onto the bearing strip with a “stomper.” Start at one end and stomp it down toward the other end.

Slide an O-Ring onto the end of the threads of a push rod. Attach a clevis bar to the push rod by sandwiching the push rod between the upper and lower clamps and tightening up the four bolts.

Then connect the clevis bars to the slats. Slide the slats under the clevis bar and line up the six holes in the clevis bar with the holes in the slat. Lay the counter bore plate on top of the clevis bar and screw in the bolts. Use lock tight to secure the bolts into the slat. Torque the bolts to 75 ft lbs (Refer to Figure 14).

Repeat this process until all the slats are connected to the push rods.

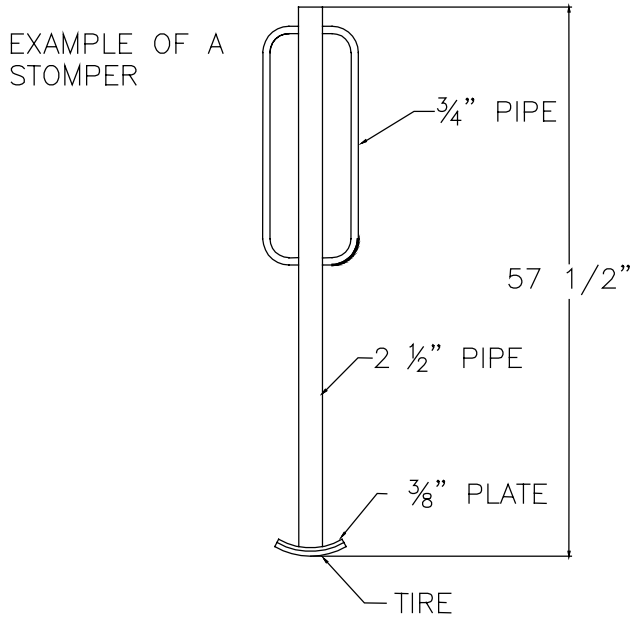


Figure 13

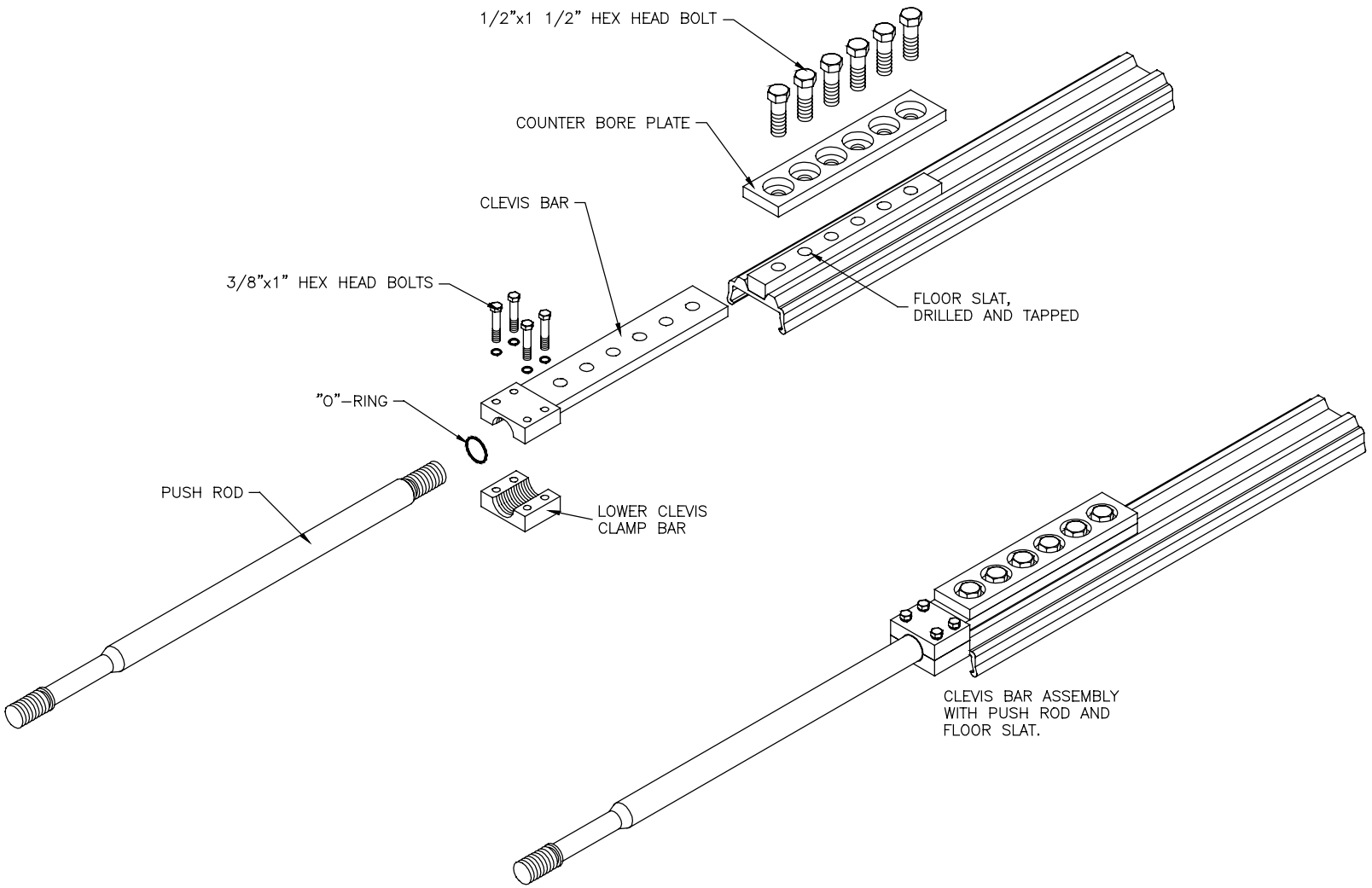

1/2"x1 1/2" HEX HEAD BOLT
COUNTER BORE PLATE
CLEVIS BAR
3/8"x1" HEX HEAD BOLTS
FLOOR SLAT,
DRILLED AND TAPPED
"O"-RING
PUSH ROD
LOWER CLEVIS
CLAMP BAR
CLEVIS BAR ASSEMBLY
WITH PUSH ROD AND
FLOOR SLAT.

Figure 14

Section 6: Slope Shield Installation

There are two different slope shields required for this unit, a lower and an upper slope shield. The lower shield is supplied with the drive unit and is necessary to protect the slat and push rod connection. The upper shield is required to cover the drive unit and is supplied by the customer.

6.1 Installing the Lower Shield

The removable, lower shield is supplied with the drive unit. (See Figure 15). An important note: When ordering a drive unit, it is important to know how the trailer will be loaded. A top loaded trailer will require a different shield than one that is compactor fed. If you install the wrong type of shield, the drive unit could be damaged.

To install the lower shield; First, measure to see how wide the inside of the trailer is at the water dam. Then trim the lower shield so that it is about ¼" narrower to allow for easier installation. You might have to remove material from both edges of the shield in order for it to fit in the trailer. If the slats are slightly off center, the cutouts for the slats may have to be modified for the shield to fit properly. Finally, the UHMW attachments at the bottom of the lower shield will sit on the sub-deck while the top of the lower shield is bolted to the water dam through the holes provided.

Tools Required:
Tape measure, grinder, ratchet and sockets

6.2 Installing the Upper Shield

The design and installation of the upper shield is the responsibility of the customer. As an upper shield is required to protect the drive unit from the load in the trailer, there are a few factors that need to be considered.

1. The shield needs to be removable, providing access to the drive unit when maintenance is required.

2. How is the trailer going to be loaded? Will it be top-loaded or compactor fed? How much of an impact will the shield need to withstand?

3. Can the upper shield be used to reinforce the front bulkhead?

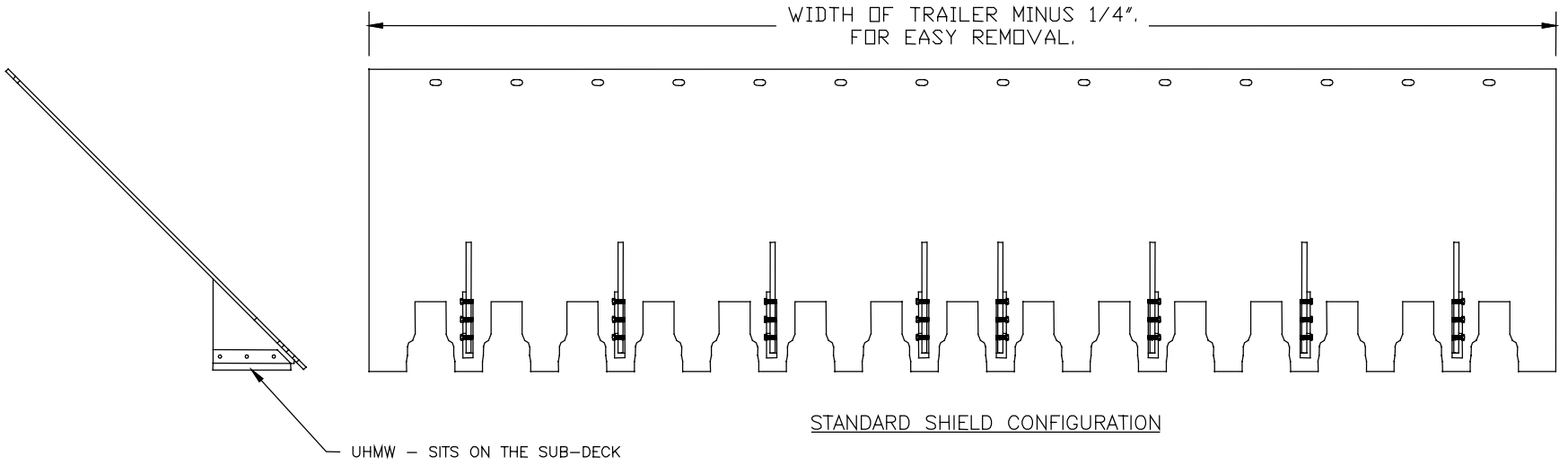

WIDTH OF TRAILER MINUS 1/4".
FOR EASY REMOVAL.
UHMW – SITS ON THE SUB–DECK
STANDARD SHIELD CONFIGURATION
UPPER SHIELD BOLT HOLES
LOWER SHIELD BOLT HOLES
LOWER SHIELD
CLEVIS BAR
PUSH ROD
WIDTH OF TRAILER
WIDTH OF SHIELD =
WIDTH OF TRAILER MINUS 1/4"
1/8"
MIN
NEED 1/8" CLEARANCE
BETWEEN SLAT AND SHIELD.
GRIND SIDE TO ALLOW
1/8" CLEARANCE.
IF SHIELD IS OFF CENTER,
YOU WILL NEED TO GRIND
ONE SIDE OF THE SHIELD IN
ORDER TO MAINTAIN THE
1/8" REQUIRED CLEARANCE.

Figure 15

Appendix:

Materials Required for Installation_(15 slat):

#44 aluminum rivets – 14 per nylatron bearing
8 per bearing strip

Aluminum floor plugs – 14 per kit.

Clevis bars – 15 assemblies.

C-bore plates – 15 per kit.

Sikaflex A1 or 221 – Approximately 1 case or 12 tubes.

Lock tight

Tools Required for Installation:

Welders - steel and aluminum.

Drill/ Drill bits (#1 or #2" drill for self-tapping screws, whichever allows the ¼" self-tapping screw to screw into the cross members); (1/8" drills for rivets)

Screw gun

Rivet gun

Caulking gun

Putty knife

Rubber mallet

Ratchet and sockets

Torque wrench

Tape measure

String and chalk lines

Hacksaw/ Saw

KEITH Mfg. Co. *Recommendation Appendix*

1) When attaching the water dam to the side of the trailer, it is recommended that you weld either angle iron or plate to the water dam and then bolt that to the side of the trailer. (See Figure 6). The stiffness between the walls and the dam are given a little room to work in comparison to a rigid joint formed if welded.

2) It is highly recommended that you weld the sub-deck to the cross members. (See Figure 8). If you use bolts, you have a greater chance of the bolts coming out when the trailer flexes.

3) Full length weld along the seam between sections of the sub-deck. (See Figure 11). Before welding these seams, make sure that the trailer walls are attached to the cross members. If the seams are welded before the walls are attached, the sub-frame will bow.

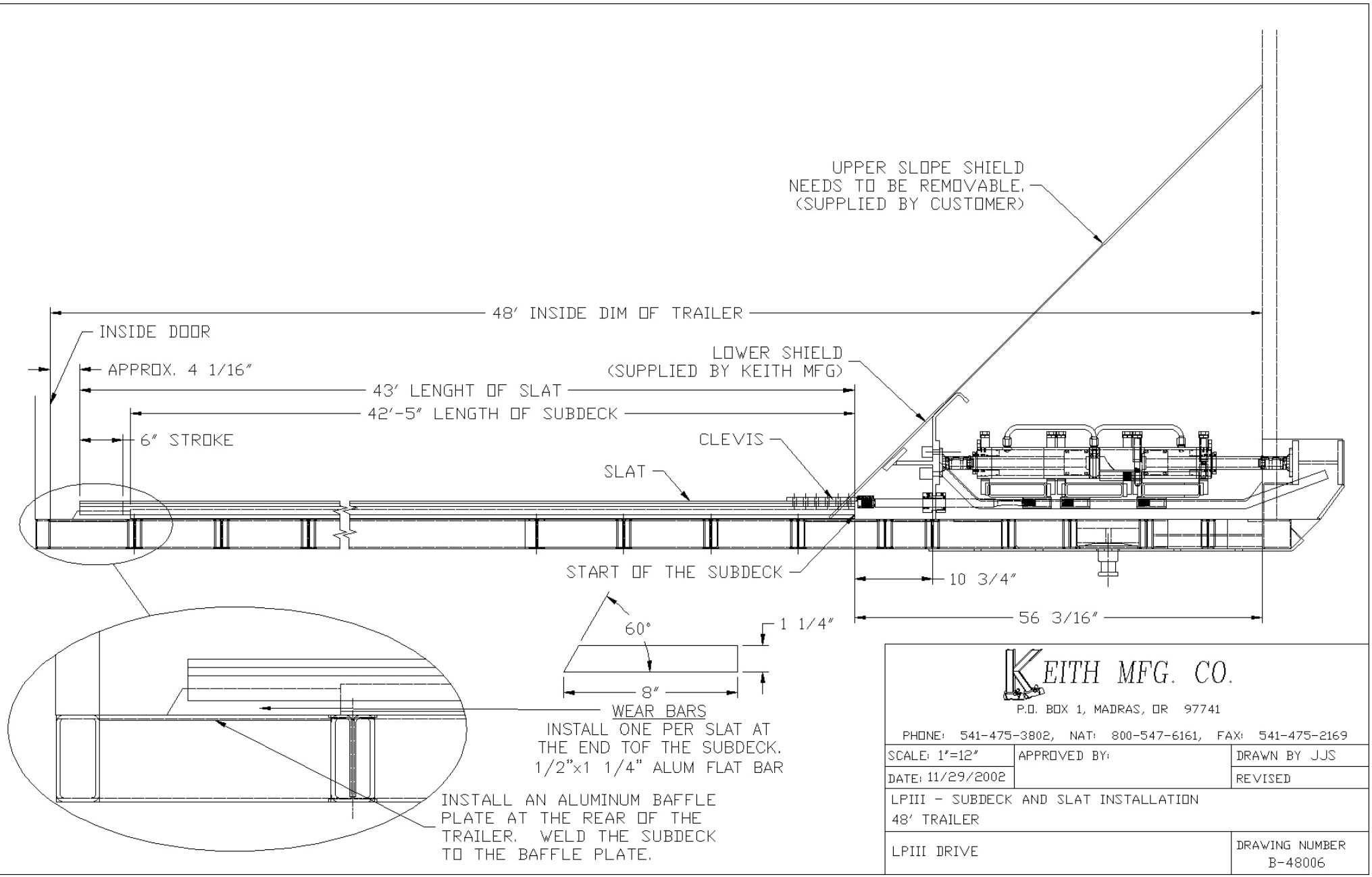
4) Use Snow White or an equivalent rubber coating on all exposed welds. Aluminum welds are often porous and it is easier to avoid pinhole leaks before they occur.

5) Proper welding equipment, wire size and technique will be necessary for welding the .150” thick aluminum sub-deck.

6) Use Sikaflex 221 on all exposed joints. In addition cover everything that might be suspected of leaking with Sikaflex

7) If the trailer leaks during water testing and the source cannot be found, adding a mixture of Water Glass (sodium silicate) to the test water in the trailer may seal small leaks. Water Glass is available at most drug stores.

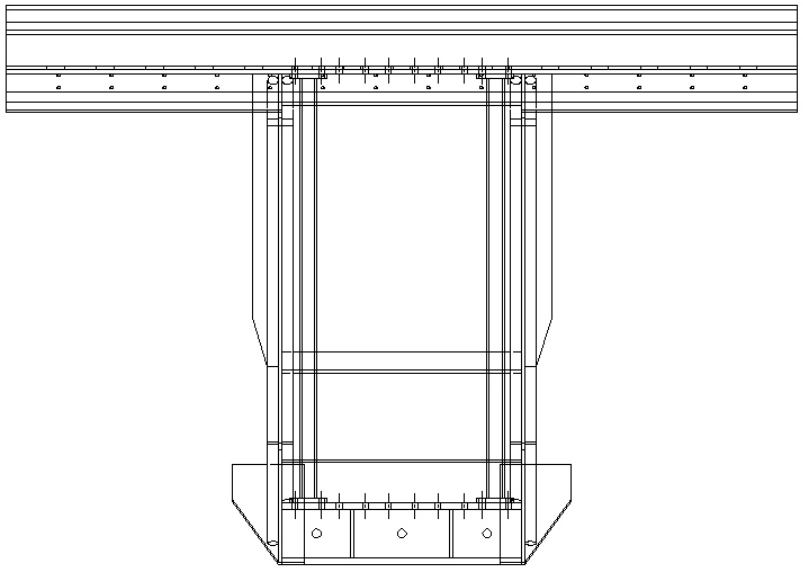
Drawing Appendix: B-48006.dwg

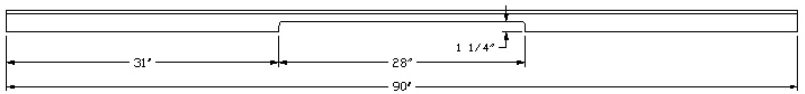


KEITH MFG. CO.
P.O. BOX 1, MADRAS, OR 97741
PHONE: 541-475-3802, NAT: 800-547-6161, FAX: 541-475-2169

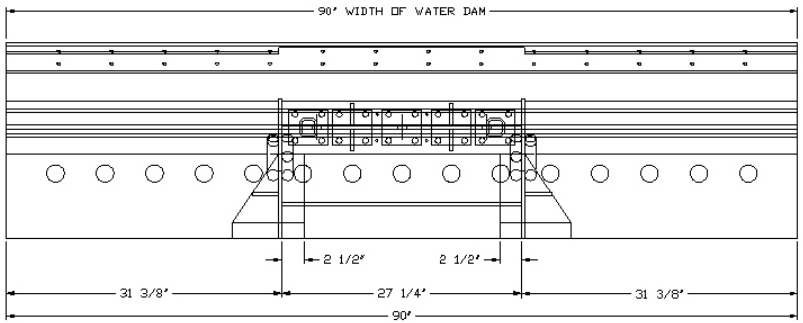
SCALE: 1"=12"	APPROVED BY:	DRAWN BY JJS
DATE: 11/29/2002		REVISED
LPIII - SUBDECK AND SLAT INSTALLATION 48' TRAILER		
LPIII DRIVE		DRAWING NUMBER B-48006

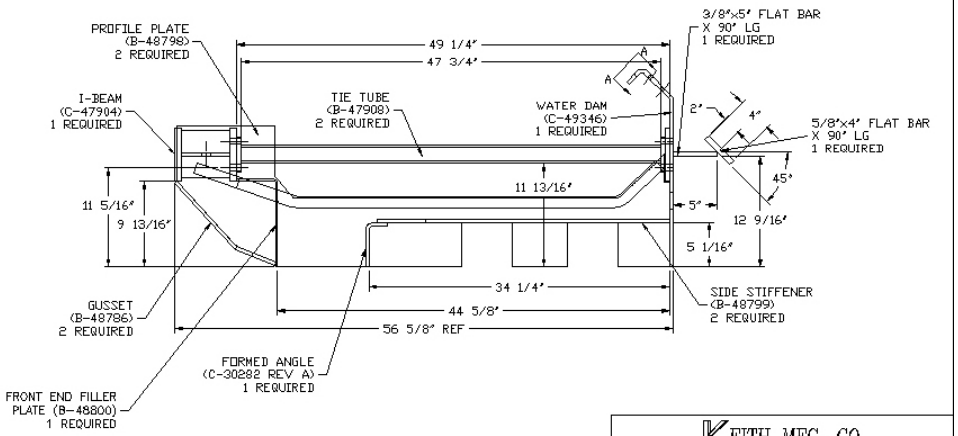
Drawing Appendix: D-49349.dwg





SECTION A-A
NOTCH WATER DAM





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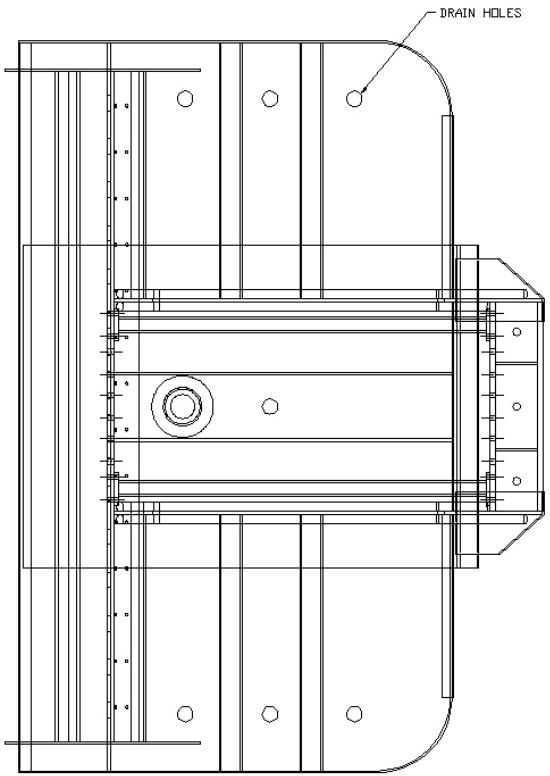
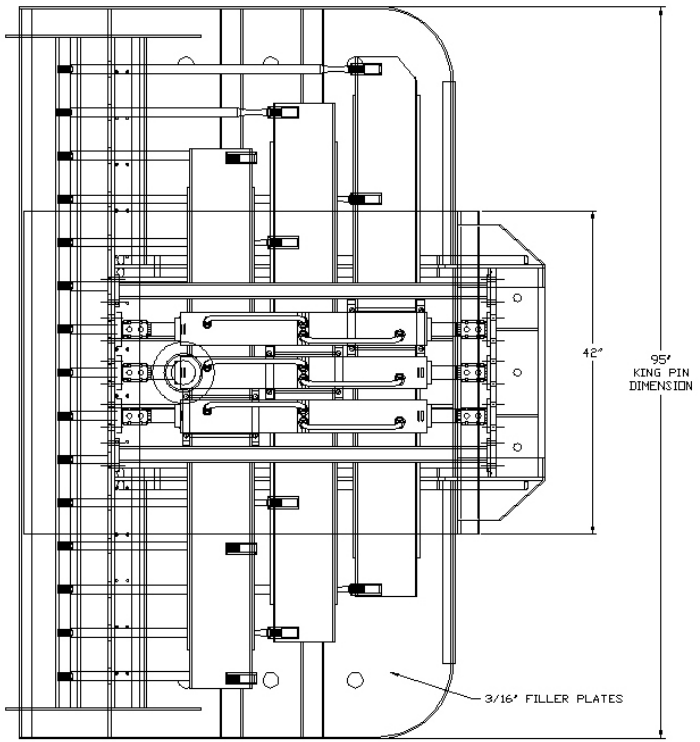
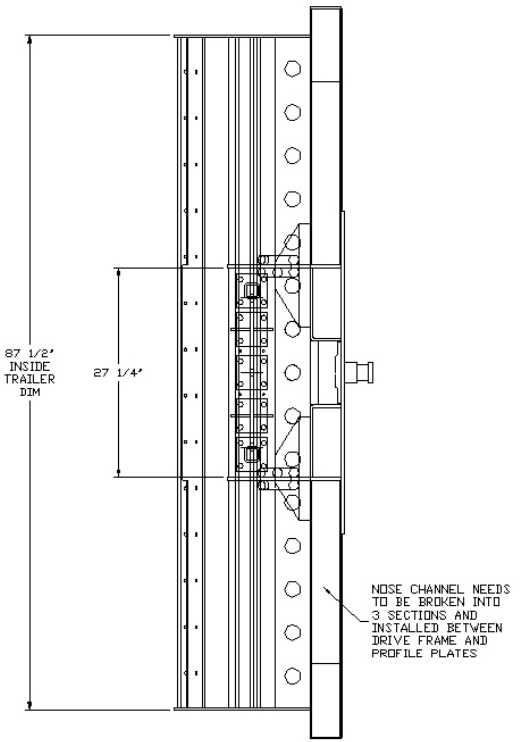
TOLERANCES UNLESS OTHERWISE NOTED			SCALE: 1"=7"	APPROVED BY:	DRAWN BY JJS
FRACTIONS ± 1/32	DECIMALS XX = ± .010 XXX = ± .005 XXXX = ± .0005	MATERIAL NOTED	DATE: 7/2/2003		REVISED
			LPIII-80mm DRIVE FRAME ASSEMBLY - 102" WIDE TRAILER		
SAW CUT LENGTH NOTED		QUANTITY 1	LPIII DRIVE FRAME		DRAWING NUMBER D-49349

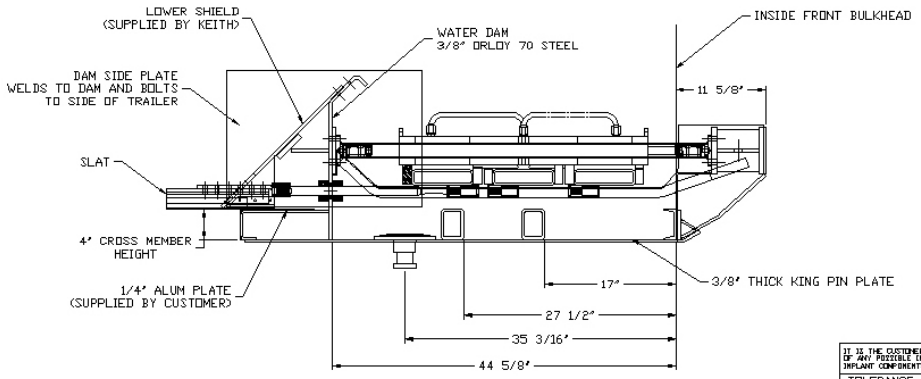
Drawing Appendix: D-50921.dwg







DRIVE FRAME SHOWN WITHOUT THE DRIVE UINT



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DATE 2/18/2004 | REVISED

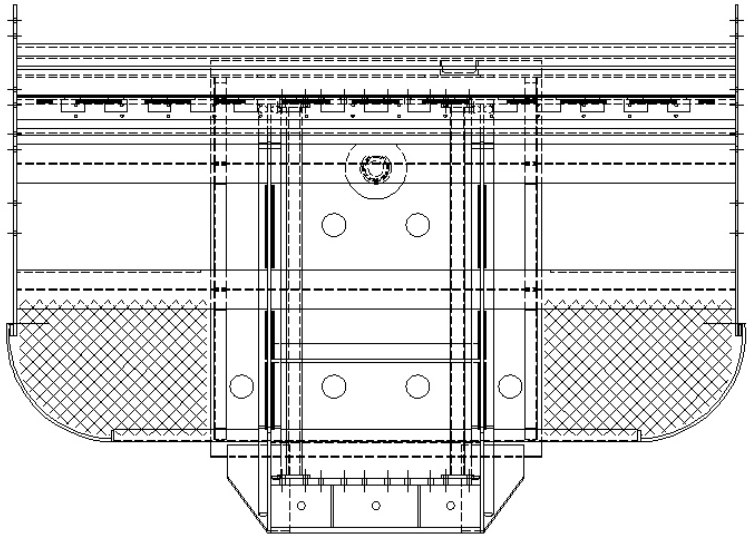
TOLERANCE UNLESS OTHERWISE NOTED
FRACTIONS ± 1/32" DECIMALS ± .004"
ANGLES ± .5 SHAFT DIA. ± .003"

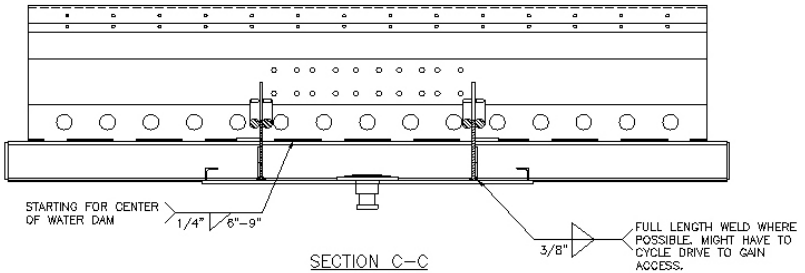
LPIII KING PIN LAYOUT FOR 96" WIDE TRAILER
DRIVE FRAME VARIES WITH CUSTOMERS

LPIII DRIVE FRAME

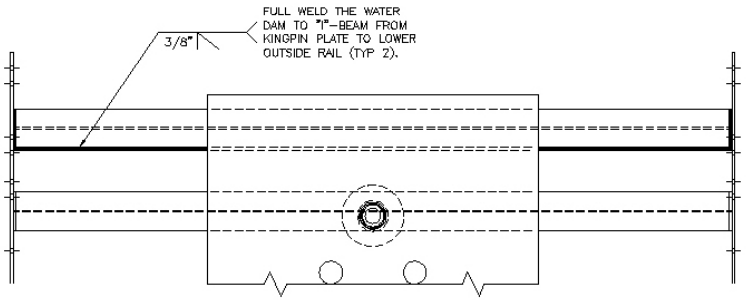
DRAWING NUMBER D-50921

Drawing Appendix: D-50922.dwg

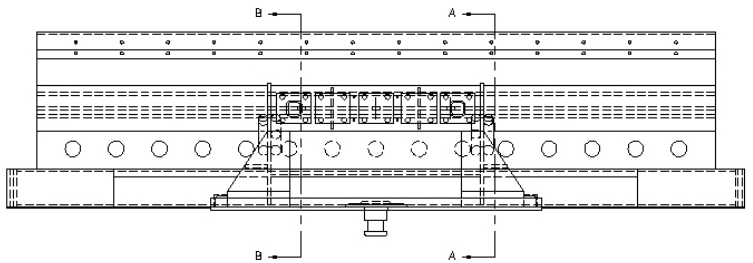


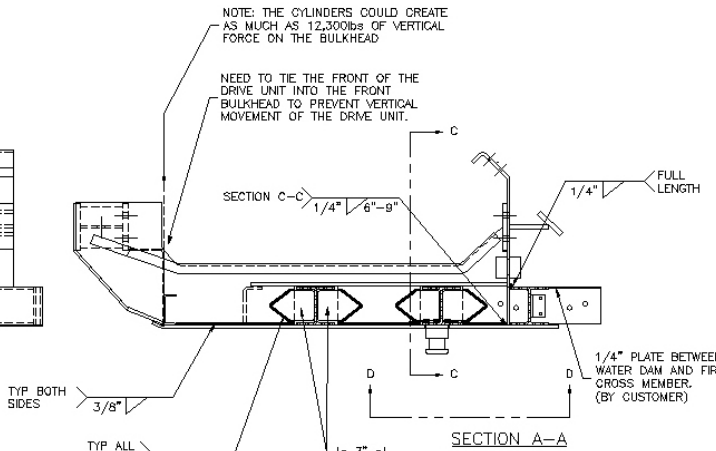


SECTION C-C

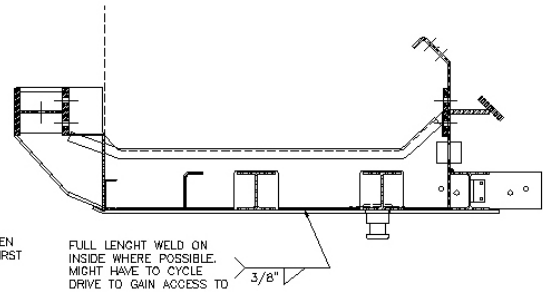


SECTION D-D





SECTION A-A



SECTION B-B

REV	NUM	BY	DESCRIPTION	DATE

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TOLERANCE UNLESS OTHERWISE NOTED
FRACTIONS ± 1/32" DECIMALS ± .XX"
ANGLES ± .5 SHAFT DIA. ± .005"

LPIII DRIVE UNIT, WELD INSTALLATION

LPIII DRIVE

DRAWING NUMBER
D-50922