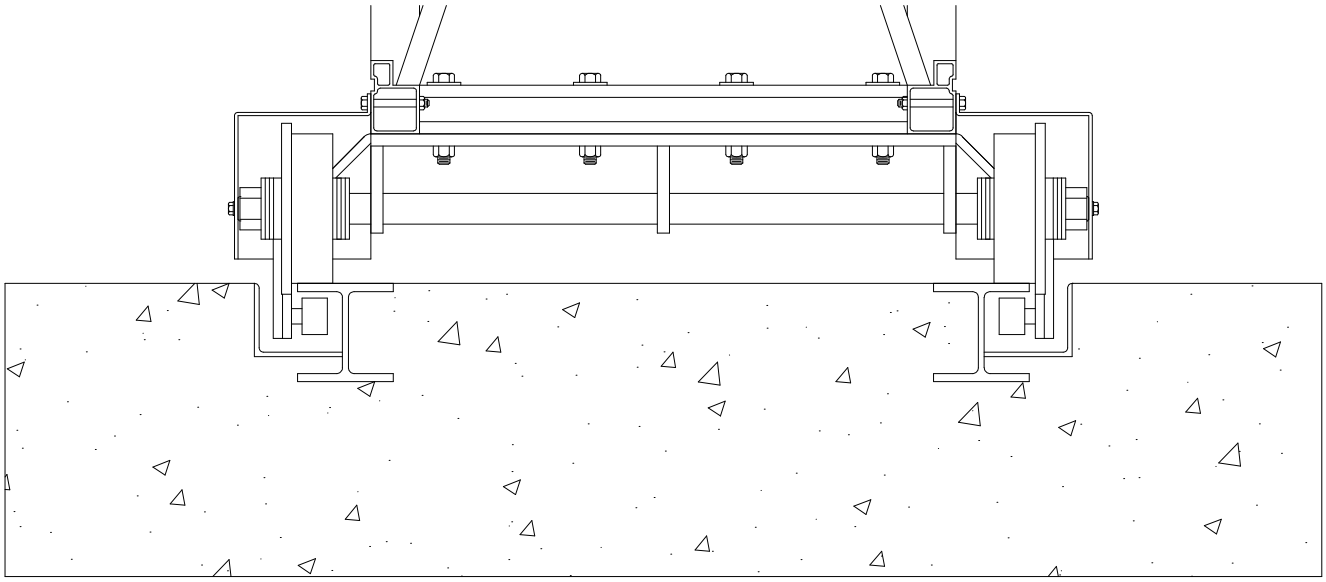
INSTALLATION AND MAINTENANCE INSTRUCTIONS

The Fortress Box Frame Roller Gate



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FORTRESS BOX FRAME ROLLER GATE SYSTEM INSTALLATION INSTRUCTIONS

(TO BE USED IN CONJUNCTION WITH FORTRESS GATE SHOP DRAWINGS)

Index

1. Construct the Track Assembly

1.1. Concrete Track Footing

1.1.1. Tymetal recommends that a local professional engineer design the track footing. The concrete footing as shown in the submittal drawing depicts the minimum dimensions required and may vary depending on local conditions.

1.2. Required Equipment/Tools:

- ✓ Transit and Site Level
- ✓ Concrete working tools and supplies

1.3. W4 x 13 Track Members

1.3.1. The construction of the track assembly is the responsibility of the owner and should be completed in accordance with the following criteria:

- ✓ The finished grade of the track shall not exceed a 1.2% slope along its length.
- ✓ The finished grade of the track shall not exceed a 0.5% slope along its width.
- ✓ The track members shall be installed in parallel and shall be spaced at a width of 2’-6” (+/-1/8”) along their entire length. See Diagram 1.3.1.
- ✓ A void space shall remain on the outside of each track member along the entire length. See Diagram 1.3.1.
- ✓ Heat cable is suggested for installations in areas where icing may occur (supplied by others).

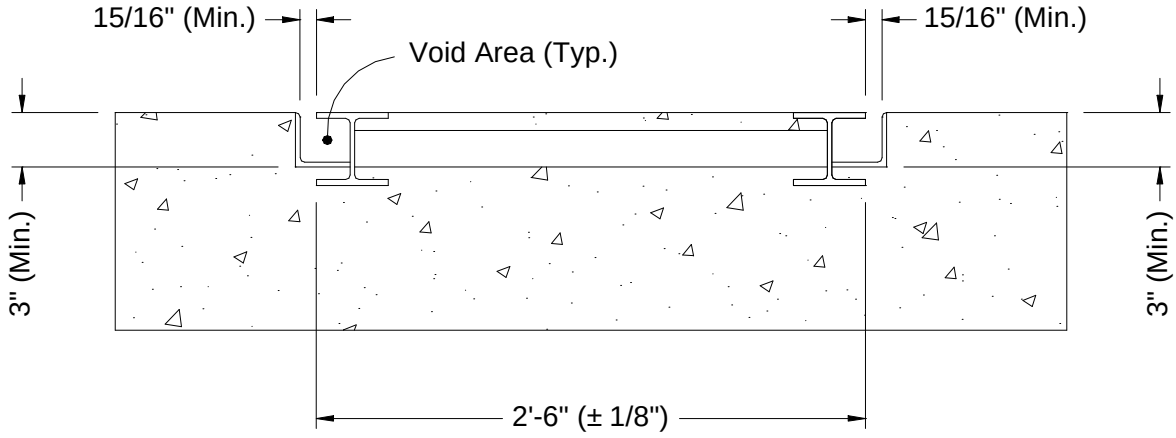
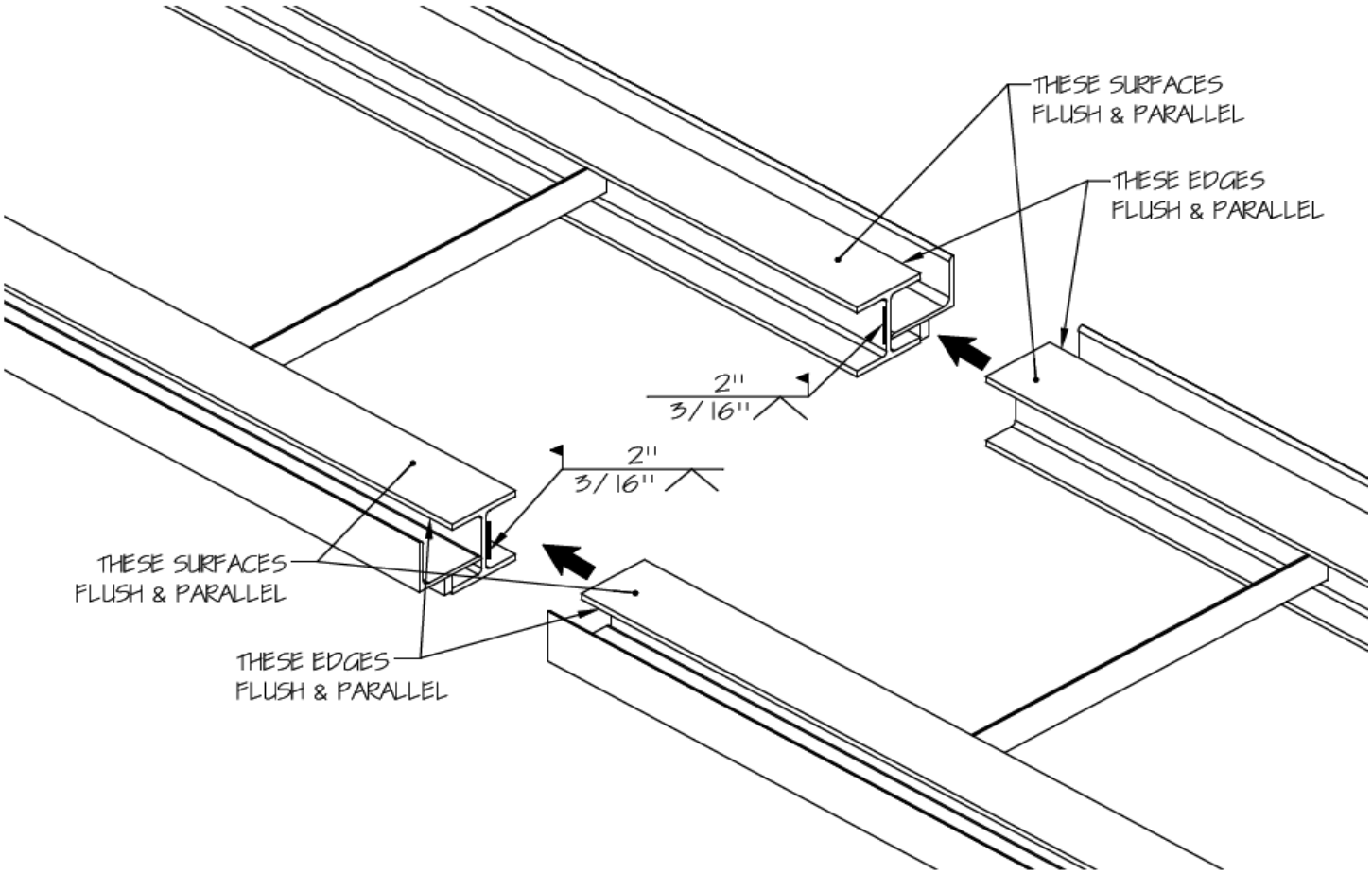


Diagram 1.3.1

Track Alignment Welding Detail

See Section 9 for Additional Track Installation Requirements



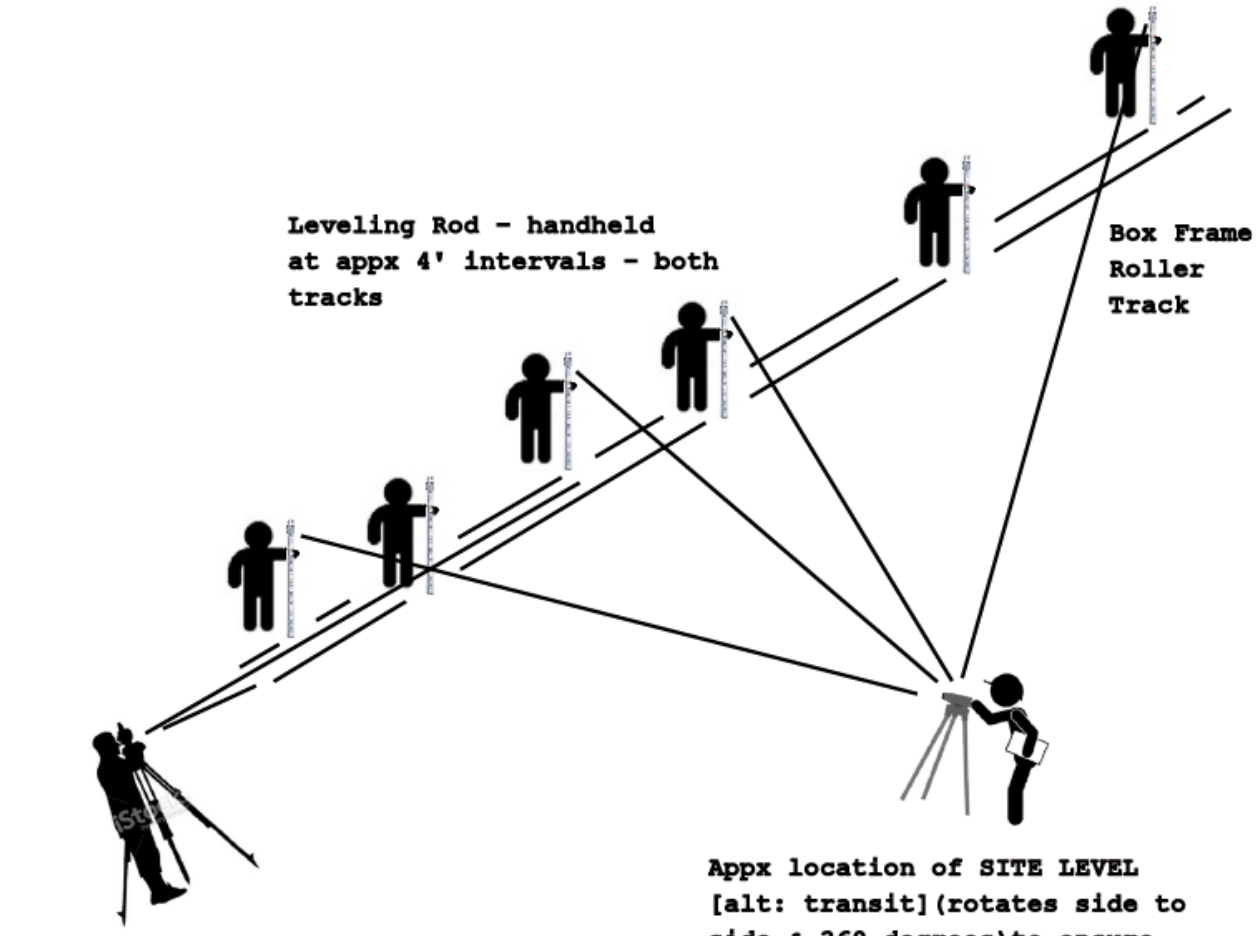
Track Ends are Welded Together as Shown

- Clamp track as required to maintain alignment for welding
- Steel may vary in cross section
- Other features at joint are not critical

Track Leveling Method

Note: Track should be leveled using transit or site level.

INSTALLATION ILLUSTRATION - Transit & Site Level
Box Frame Roller Track



1.4 Recommended Methods of Install- <u>Wooden Track Supports</u>

Note: The foundation required for your installation may vary from the following examples. Refer to project specific drawings.

1.4.1 Construct the following track supports out of wooden members as shown in Diagram 1.4.1. Track supports are needed approximately every 5’ along the entire length of the track. Review submittal drawings for track details.

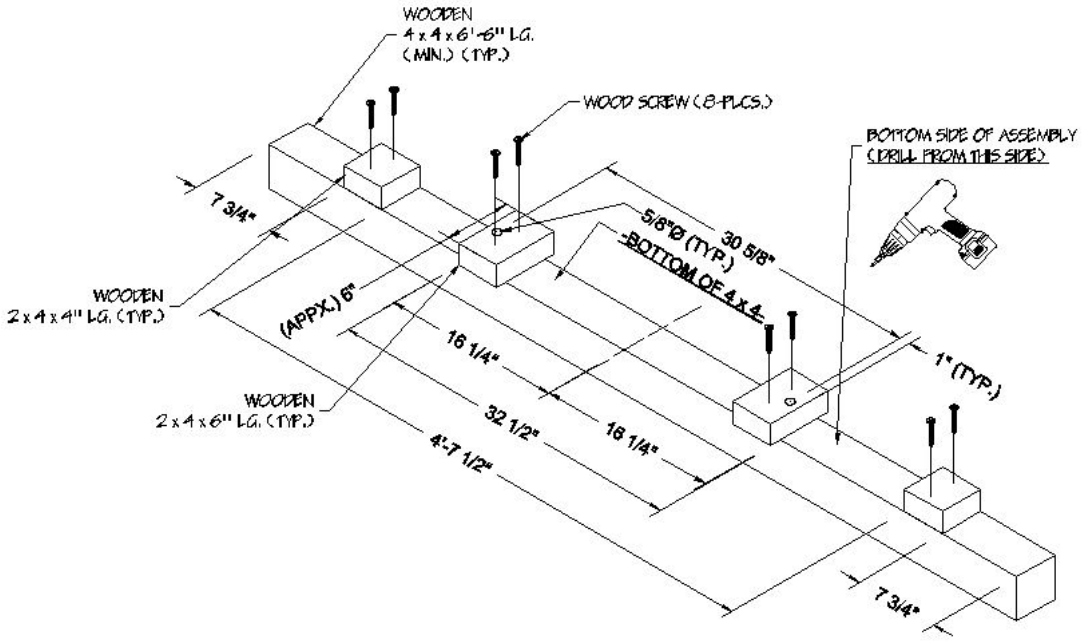


Diagram 1.4.1

1.4.2 Install ½" threaded rod thru the 5/8" Ø holes drilled in step 1.4.1. Tack weld the lower nut to washer (2 places).

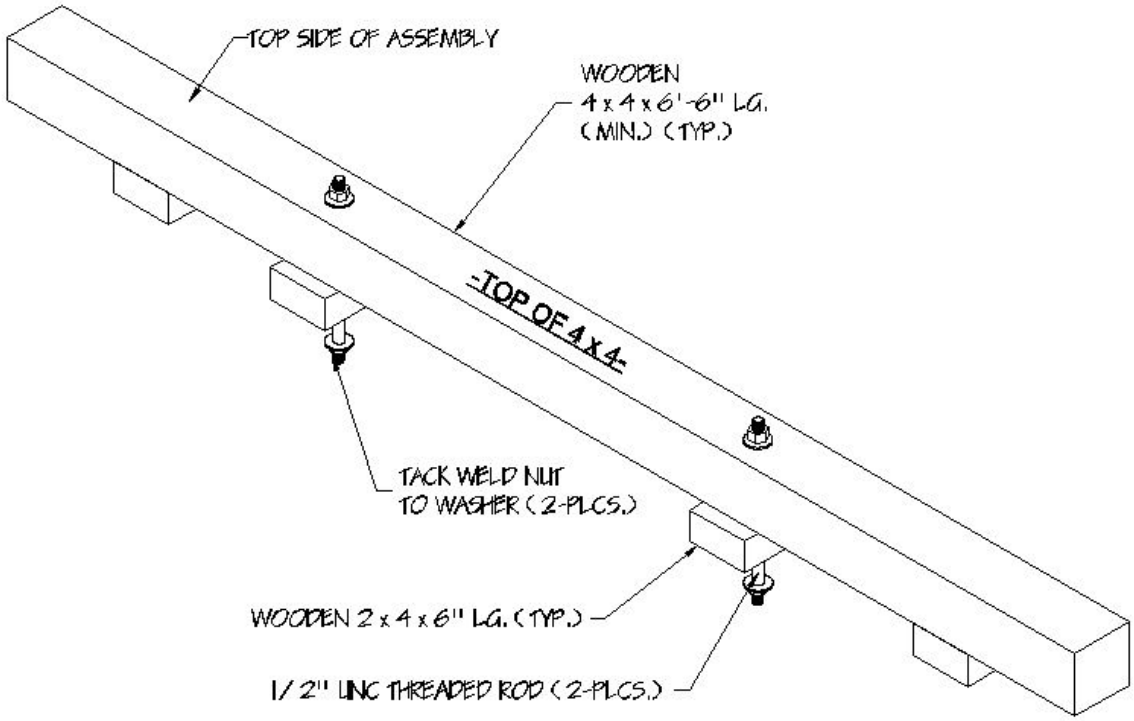


Diagram 1.4.2

1.4.3 Install anchors (if required) in the track. Fasten track to the lower side of the support brace using the threaded rod.

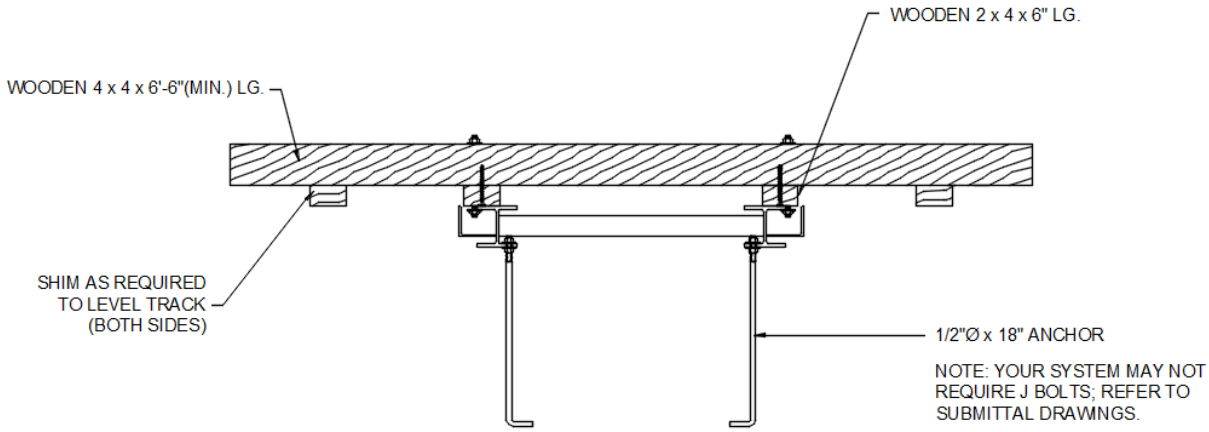


Diagram 1.4.3

1.4.4 Install rebar (if required) in the trench as shown.

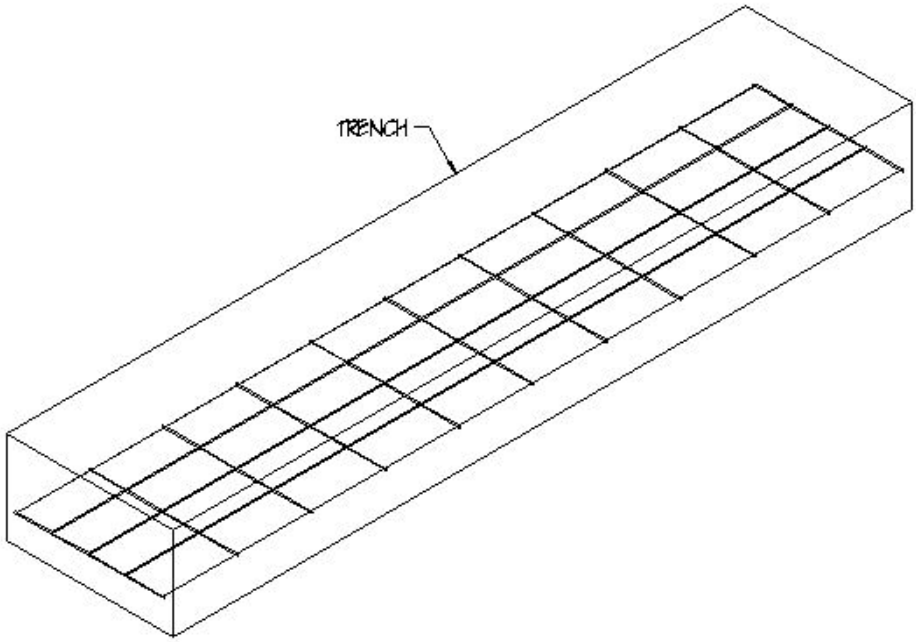


Diagram 1.4.4

1.4.5 Set form boards along the length of the trench and level with a transit. After level and within requirements called out in 1.3.1 and Section 9, place track supports every 5' along the length of the trench. Stake as shown.

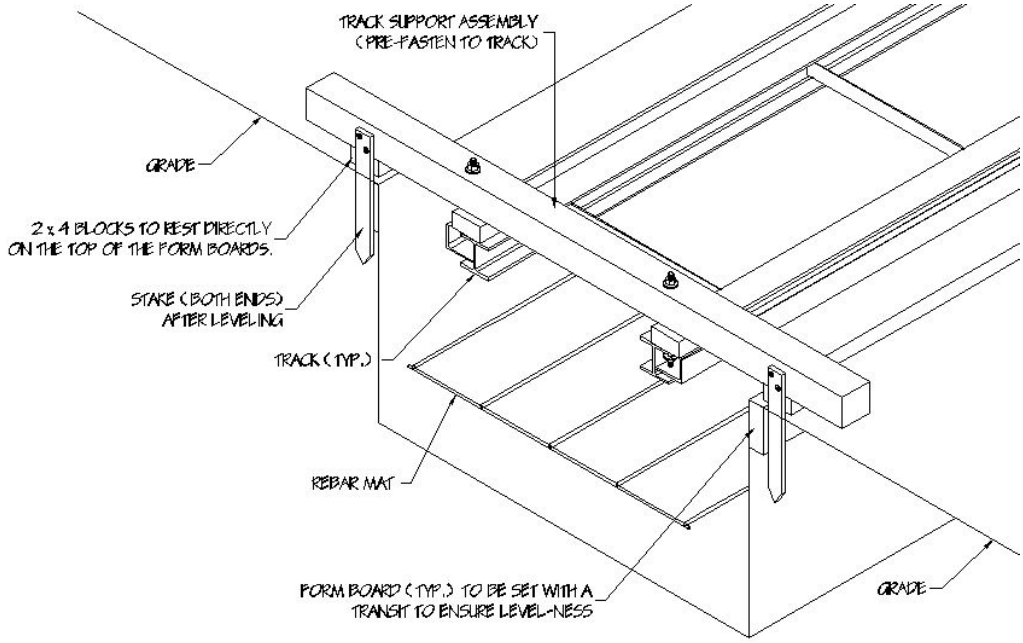


Diagram 1.4.5

1.4.6 Lift the rebar mat and suspend using the lower bend of the anchors. Verify levelness of the system; refer to Section 9. Pour concrete.

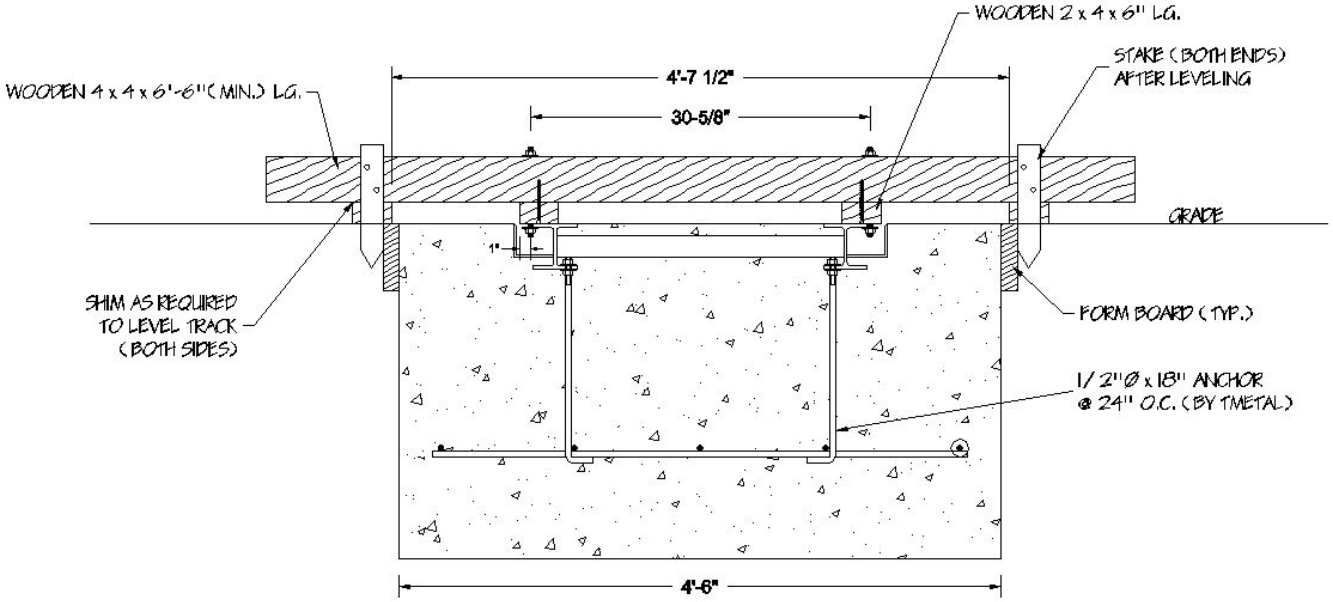


Diagram 1.4.6

1.5 Recommended Methods of Install- 2-Step Pour

1.5.1 Complete an initial concrete pour. Using holes in the track cross members as a guide, drill in the sub-pad along the entire length of the track. Epoxy ½" Jack screws in place.

1.5.2 Install the track. Use Nuts to level the track to requirements specified in sections 1.3.1 and 9. Complete the final pour.

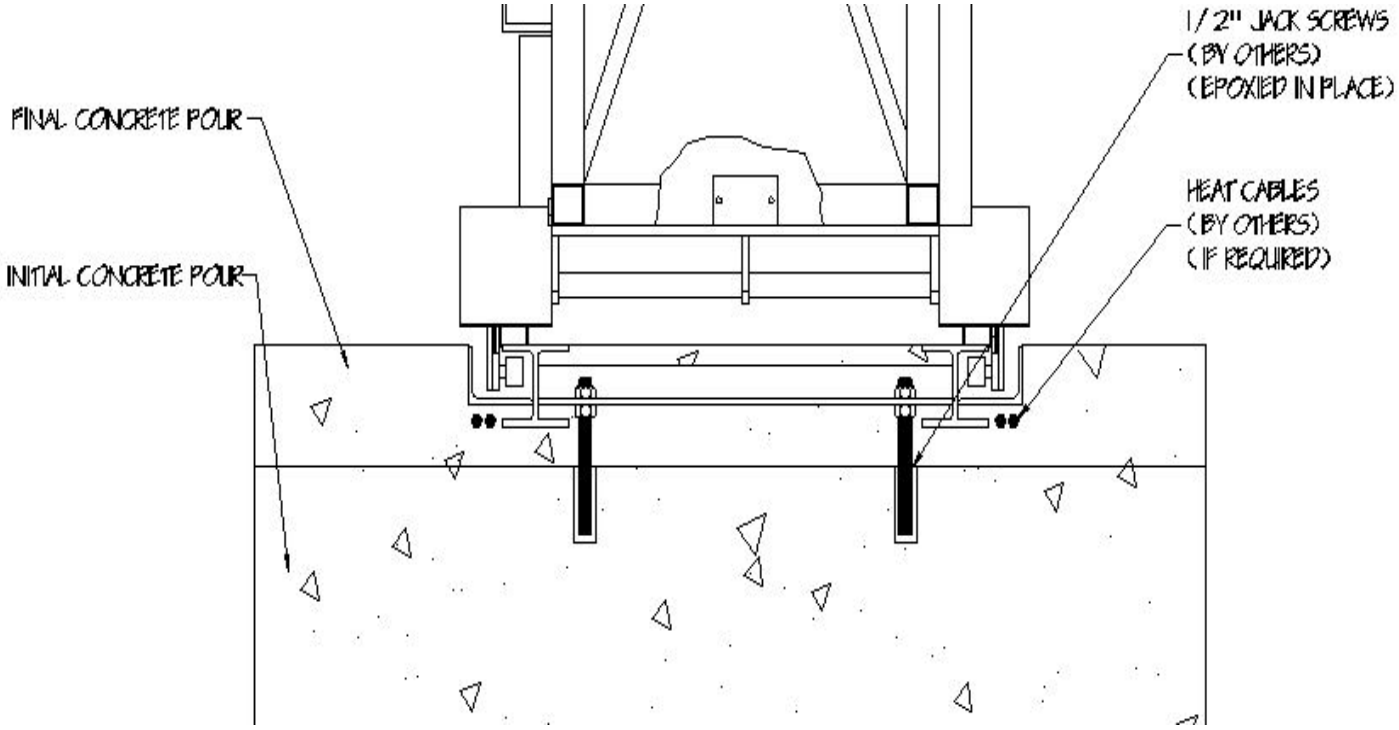


Diagram 1.5.2

2. Prepare the Gate Frame

2.1. Required equipment/tools:

- ✓ Forklift or equivalent equipment with a minimum lifting capacity of 3000 pounds.
- ✓ Power Drill
- ✓ 5/16” Drill Bit
- ✓ 1 1/2" open-end wrench.
- ✓ 3/4" open end wrench (2)
- ✓ 9/16” open end wrench (2)
- ✓ 1/2" open end wrench (2)
- ✓ 7/16” open end wrench
- ✓ Standard Pliers
- ✓ Locking Pliers
- ✓ 8” C-Clamps (8)

2.2. Required Materials (If chain link fabric is to be installed on the frame)

- ✓ Fabric to match the adjoining fence (Refer to section 3.1 for fabric size requirements)
- ✓ Two (2) tension bars per gate section (1' shorter than the nominal gate height)
- ✓ #14 and #16 aluminum fabric ties

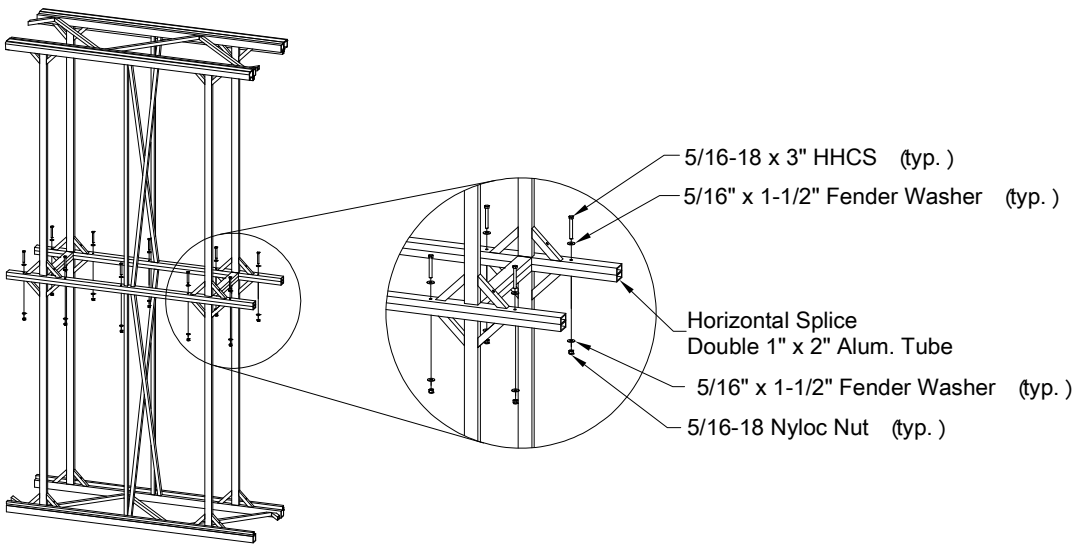
2.3. Check Hardware Box

2.3.1. Check the packing list to be certain that all required parts are enclosed.

2.4. Unload and arrange materials

2.4.1. Find a clean area alongside the track to lay the gate out, and check to see that all components have been included. Be sure the gate panels are laid out in order, with the fabric side up.

2.4.2. Your gate may have been built with a horizontal splice joint. If so, join the upper and lower sections as shown below.



3. Install the Fabric (if required)

3.1. If the gate requires fabric, now is the time to install it using the fabric hardware kit provided in your hardware box along with tension bars and tie wires from your own stock. The height of each piece will be equal to 1'-0" less than the nominal gate height. For example: If the nominal gate height is 5'-0", then the fabric height shall be 4'-0".

3.2. Using the fabric hardware kit provided and a standard tension bar, secure each end of the fabric to the respective end vertical member on each gate section.

3.3. Tie the fabric to each intermediate vertical member using a minimum of three (3) aluminum tie wires on each.

4. Install Barbed Wire Arms

4.1. If barbed wire arms are to be installed, a kit will be provided. Refer to additional instructions included with your barb arm hardware kit.

4.2. For your convenience, the barbed wire arms have been located on the gate frame prior to shipment and the appropriate holes have been drilled.

4.3. Each end barbed wire arm is pre-drilled with four 3/8" holes to accommodate the 5/16" x 5" HHCS's.

4.4. Line up the pre-drilled holes in the barb arm with the pre-drilled holes in the top of the gate frame.

4.5. Insert the 5/16" x 5" HHCS's through the holes from the top of the gate and secure each with a 5/16" lock washer and 5/16" hex nut.

4.6. Tighten completely and repeat this procedure at the opposite end of the gate.

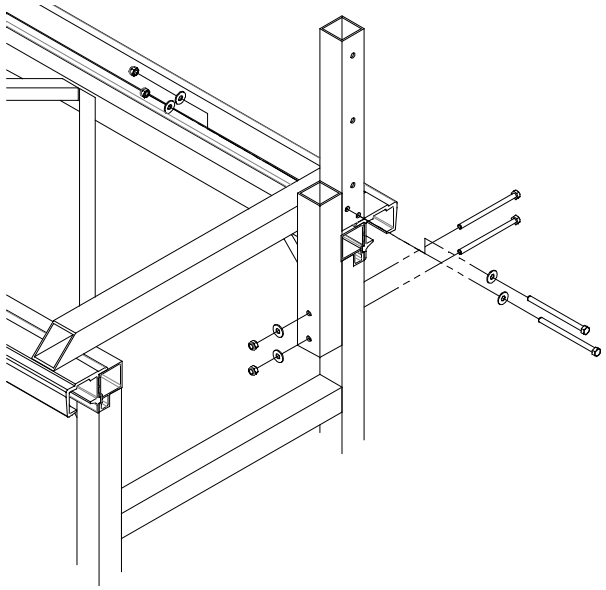


Diagram 4.6

5. Assemble/Install the Gate Frame

5.1. Locate and install the trolley assemblies on the gate panels. Note: At the center of the gate frame, attach the trolley to only one (1) panel at this time. See Diagram 5.1.

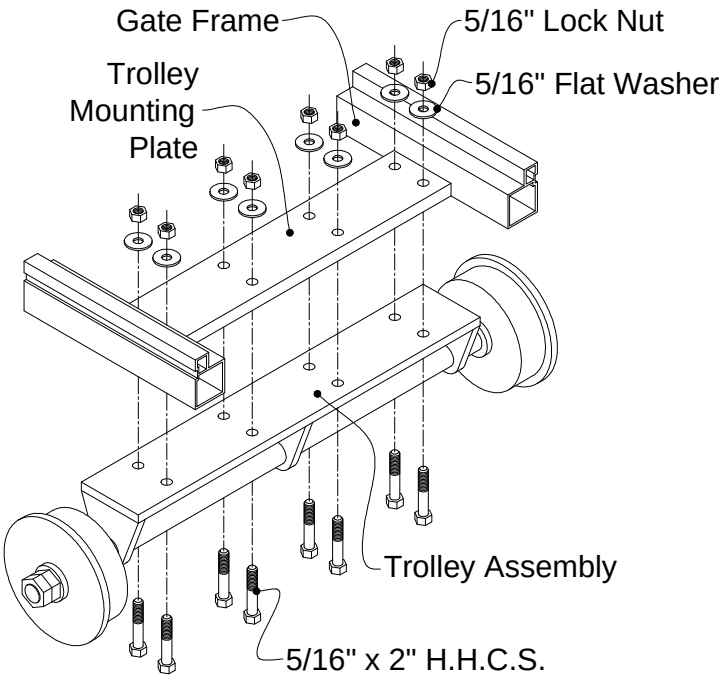


Diagram 5.1

5.2. Along the bottom of the gate panel, locate the sets of two predrilled 3/8” diameter holes for mounting the safety clips. See Diagram 5.2A. See Diagram 5.2B. DO NOT install the clips at this time. Clips will be installed at step 5.10.

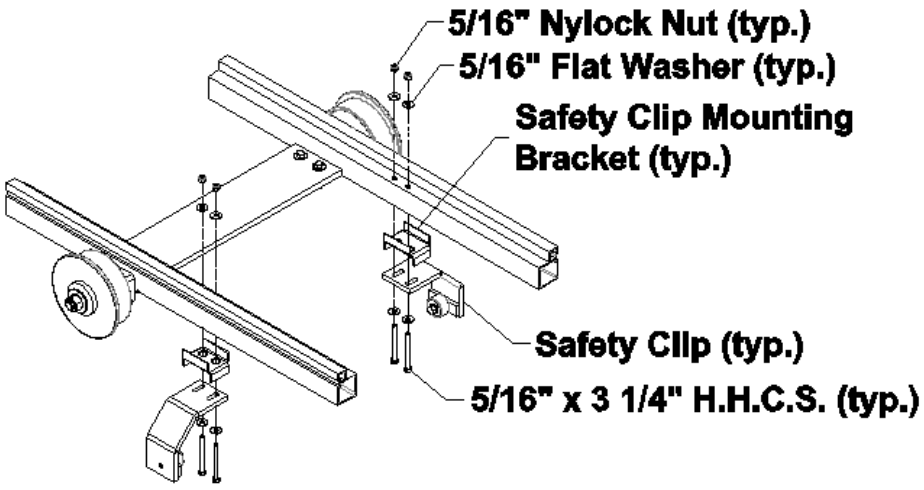


Diagram 5.2A

5.3. Grade gap filler angle, if required, are supplied in slotted four foot lengths to be field attached to the bottom outside member of the gate with the self-tapping screws supplied. The gap filler should be continuous across the entire length of the gate and lengths of angle should be cut to fit at wheel covers and safety clips.

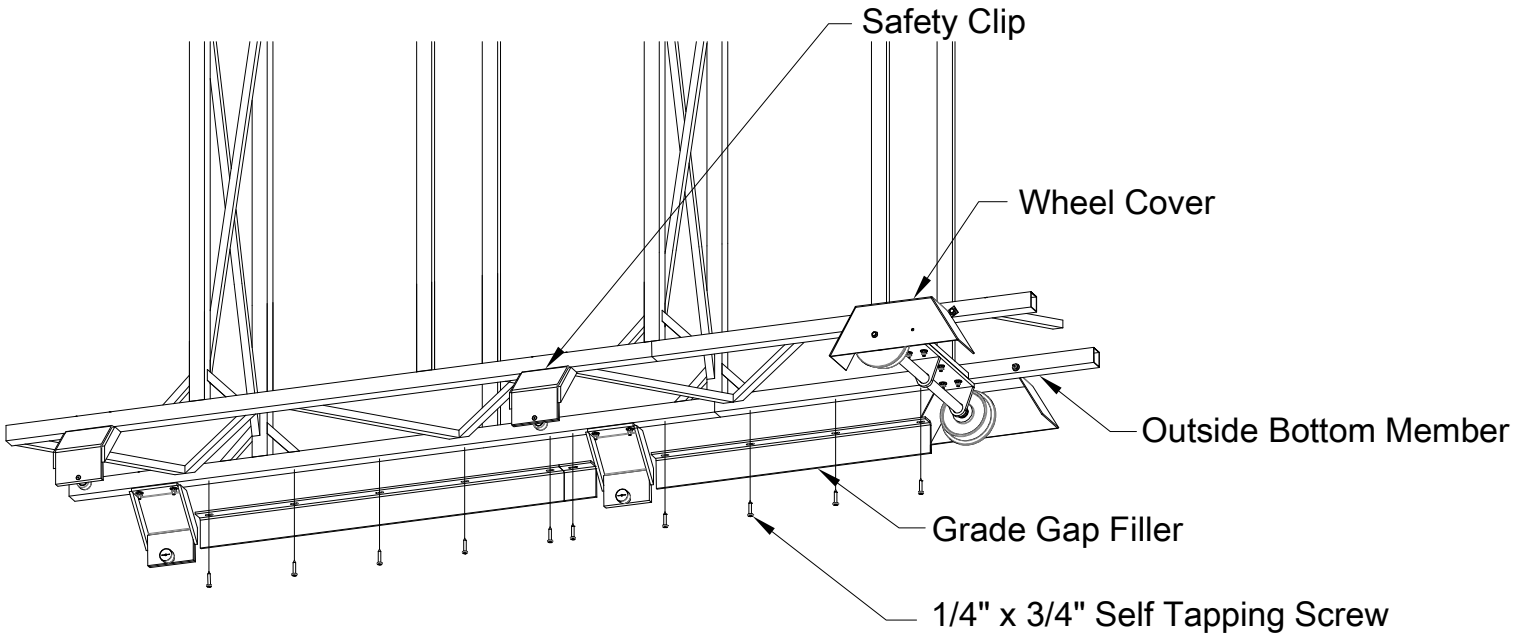


Diagram 5.3A

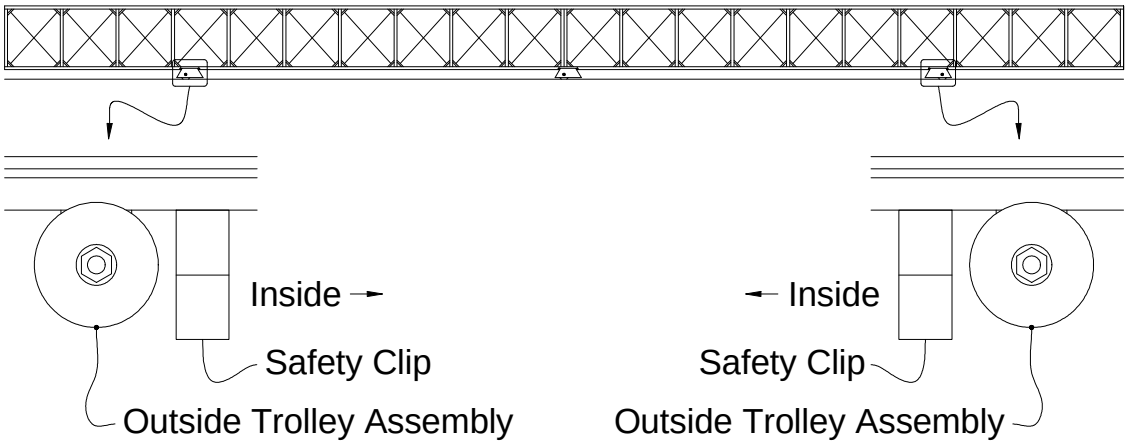


Diagram 5.2B

5.4. Locate the center gate panel with two (2) trolley assemblies mounted on it and lift it into position on the track assembly.

CAUTION! Be careful not to damage the threads on the ends of the trolley axles when lifting the panels.

5.5. Block all four wheels to prevent any gate movement.

5.6. Install the safety clips at the pre-drilled locations on the bottom of the gate panel. See Diagram 5.2A.

5.7. Locate the adjacent center gate panel and lift it into position on the track assembly, resting the end on the exposed trolley base of the previously installed panel.

5.8. Block the additional wheels to prevent any gate movement.

5.9. Locate splice hardware and fasten the panels together. See Diagram 5.8.

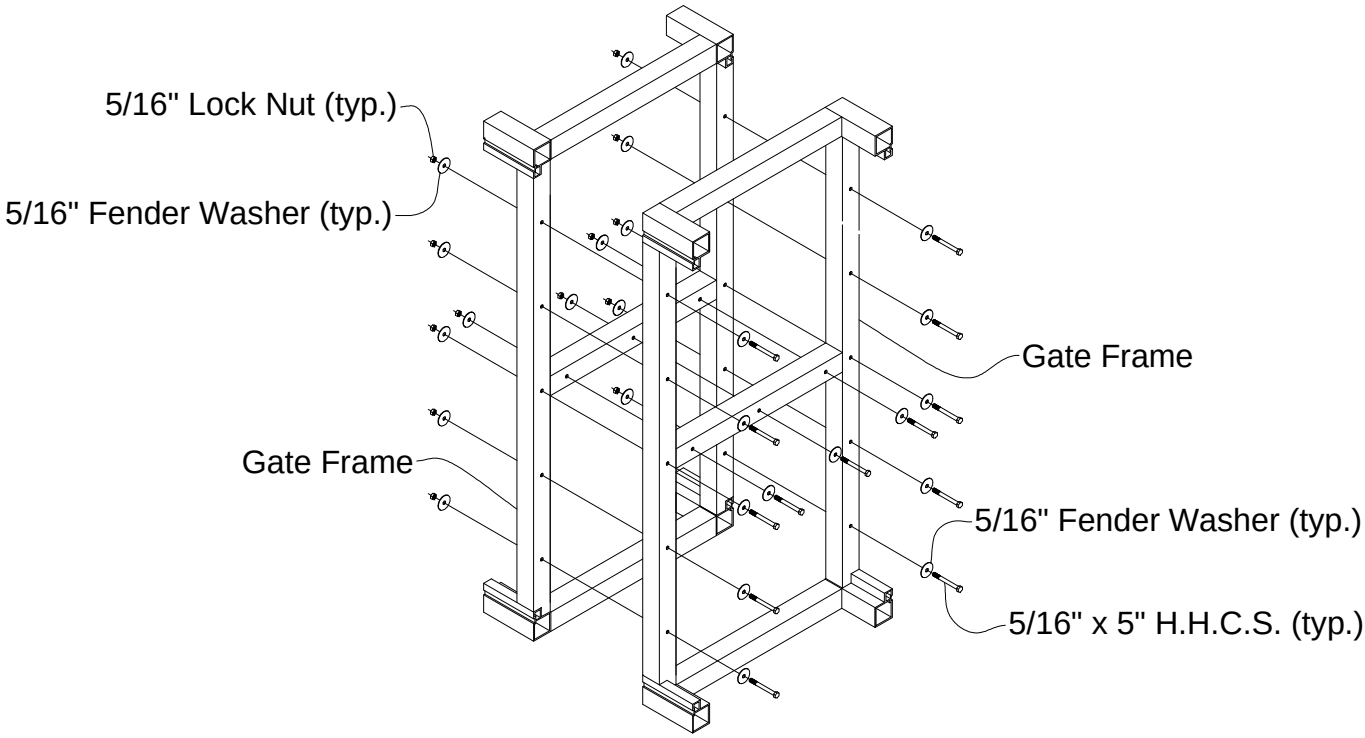


Diagram 5.8

5.10. Complete the installation of the center trolley assembly. See Diagram 5.1.

5.11. Install the safety clips at the pre-drilled locations on the bottom of the gate panel. See Diagram 5.2A.

5.12. Select one of the remaining end gate panels and lift it into position on the track assembly.

5.13. Locate splice hardware and fasten the panels together. See Diagram 5.8.

5.14. Block the additional wheels to prevent any gate movement.

5.15. Install the safety clips at the pre-drilled locations on the bottom of the gate panel. See Diagram 5.2A.

5.16. Lift the last end gate panel into position on the track assembly.

5.17. Locate splice hardware and fasten the panels together. See Diagram 5.8.

5.18. Block the additional wheels to prevent any gate movement.

5.19. Install the safety clips at the pre-drilled locations on the bottom of the gate panel. See Diagram 5.2A.

5.20. Install all wheel covers. See Diagram 5.19.

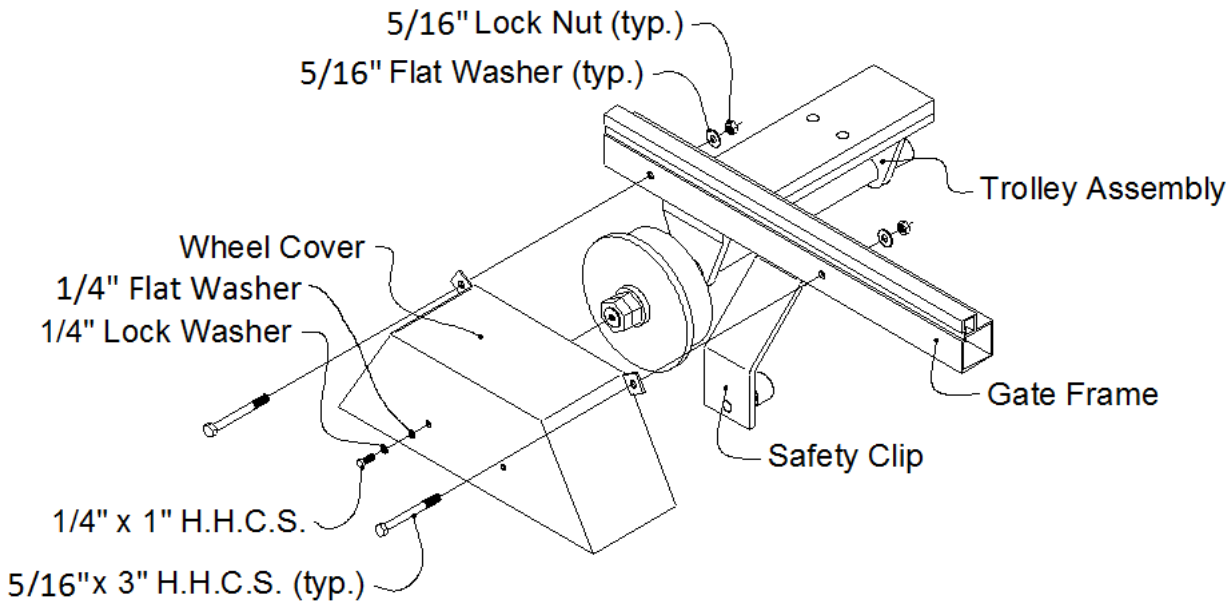


Diagram 5.19

5.21. Remove all previously installed wheel blocks.

6. Install Gate Operator

6.1. Install the selected gate operator per the manufacturer's written instructions.

7. Recommended Maintenance Schedule

CRITICAL!!! To insure proper gate operation and avoid damaging the gate, it is essential that the void areas on each side of the track be kept free of any blockage at all times.

7.1. Gate Frame

7.1.1. Inspect the void areas along the length of the track and remove any build-up immediately after any snowfall.

7.1.2. Inspect and remove any debris in the void areas along the length of the track daily or as required.

7.1.3. Inspect the all trolley connections every 6 months.

7.1.4. Inspect all bolted connections yearly.

7.2. Operator/Drive Rail

7.2.1. Review all literature provided by the operator manufacturer and perform all operator maintenance in strict accordance with the operator manufacturer's recommendations.

7.2.2. Inspect the drive rail and drive wheel alignment a minimum of once every 6 months and realign if necessary. For gates & operators that are subject to continuous duty, a monthly visual inspection of the drive wheels and wheel tensioning nuts is recommended. If drive wheels appear to be misaligned (drive wheels horizontally pushing or "walking" on the drive rail).

7.2.3. Inspect the drive rail for debris or build-up a minimum of once a week. **CRITICAL: Remove snow and ice immediately after any build-up occurs.**

7.3. Wheels and Bearings

7.3.1. Visually inspect the wheels monthly.

On a bi-annual basis the following wheel inspection and service is required:

7.3.2. Remove a single wheel cover and wheel per gate and inspect bearings for wear or damage. NOTE: Do not remove inside shims unless they appear worn or damaged. Refer to Diagram 8.2. Sparingly grease all flanged track wheels with NGLI2 grease with a grease gun. The wheels are fitted with grease fittings.

7.3.3. If no maintenance is required:

7.3.3.1. Reinstall the wheel assembly with bearings and seals.

7.3.3.2. Reinstall the outer shims.

7.3.3.3. While spinning wheel, reinstall the inside jam nut and tighten until wheel stops spinning.

7.3.3.4. When the wheel stops spinning, back the nut off 1/4 turn.

7.3.3.5. Check to see that wheel spins freely, If not, back nut off another 1/4 turn.

7.3.3.6. Reinstall the second jam nut and tighten to 100 ft. lbs. while at the same time making sure not to turn the inside jam nut.

7.3.3.7. Reinstall wheel cover.

7.3.4. If only grease is required:

7.3.4.1. Reinstall front and rear bearings and seals in wheel as required.

7.3.4.2. Reinstall inner shims if required.

7.3.4.3. Reinstall the wheel assembly with bearings and seals.

7.3.4.4. Reinstall the outer shims.

7.3.4.5. While spinning wheel, reinstall the inside jam nut and tighten until wheel stops spinning.

7.3.4.6. When the wheel stops spinning, back the nut off 1/4 turn.

7.3.4.7. Check to see that wheel spins freely, If not, back nut off another 1/4 turn.

7.3.4.8. Reinstall the second jam nut and tighten to 100 ft. lbs. while at the same time making sure not to turn the inside jam nut.

7.3.4.9. Reinstall wheel cover.

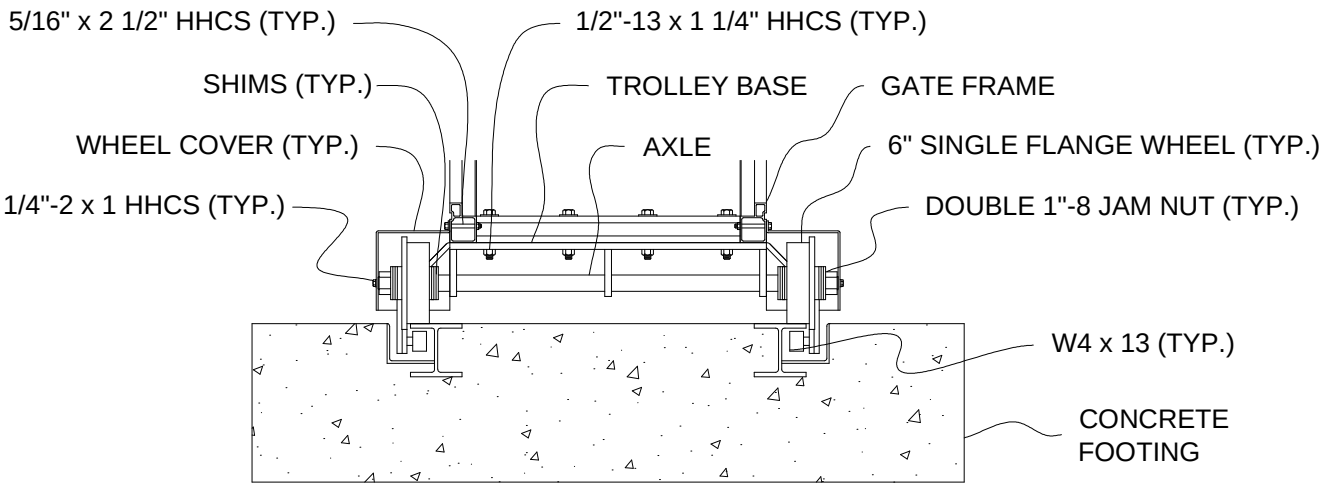
7.3.4.10. Using a grease gun with NGLI2 grease sparingly lubricate the wheel bearings.

7.3.5. If bearings are damaged the wheel should be replaced.

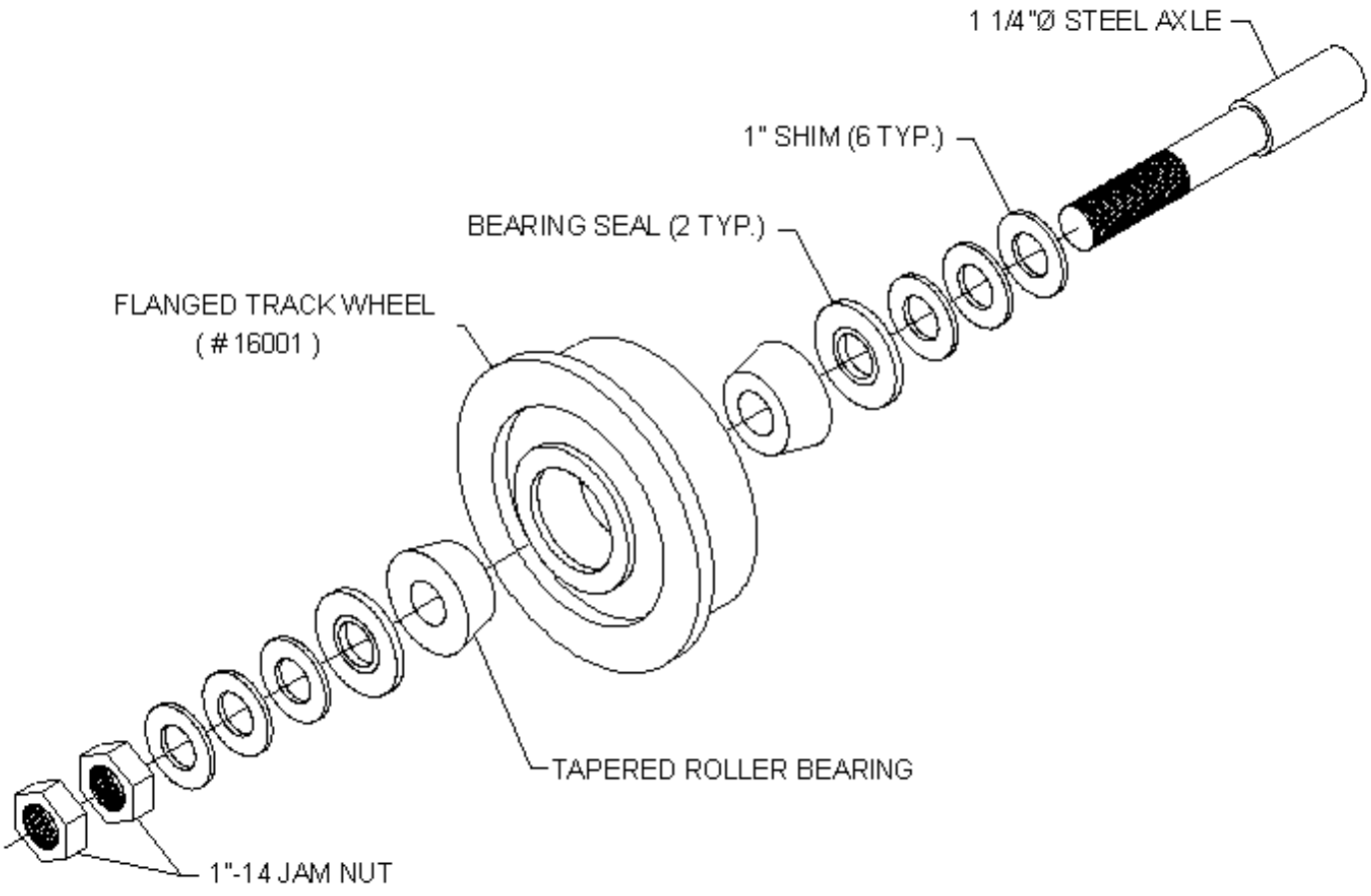
7.3.6. Repeat at each wheel location.

8. Related Drawings

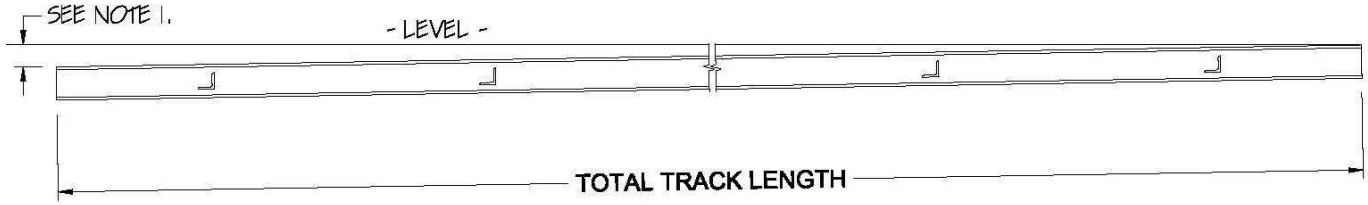
8.1. Trolley Assembly Section



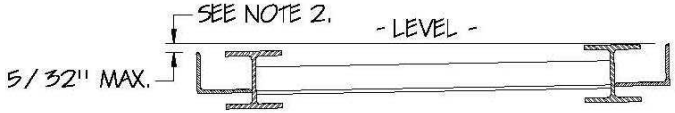
8.2. Wheel Assembly



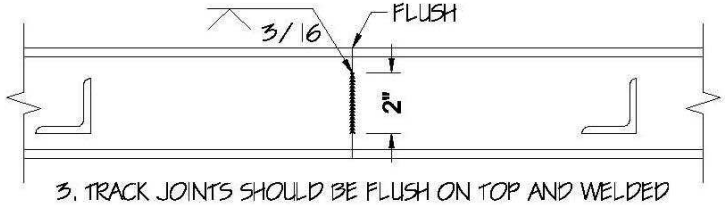
NOTE:
TO INSURE PROPER GATE FUNCTION, USING A TRANSIT, SET THE TRACK RAILS AS STRAIGHT AND LEVEL AS POSSIBLE.



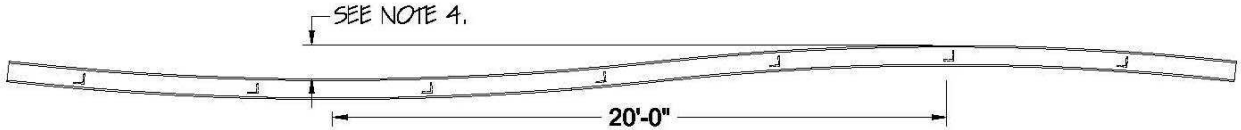
1. THE FINISHED GRADE OF THE TRACK SHALL NOT EXCEED 1 1/2" / 10' SLOPE ALONG ITS LENGTH.
*A MINIMAL SLOPE WILL ALLOW WATER TO DRAIN.



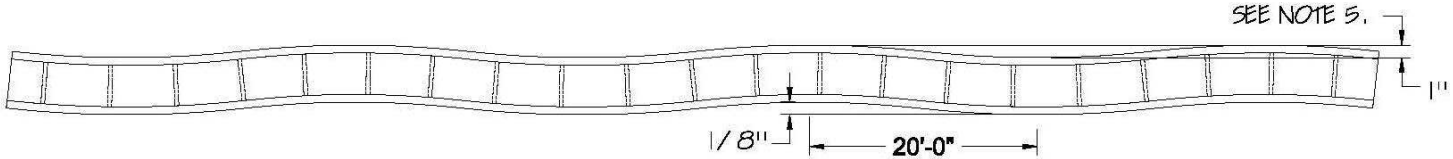
2. THE FINISHED GRADE OF THE TRACK SHALL NOT EXCEED THE SLOPE SHOWN ALONG ITS WIDTH.



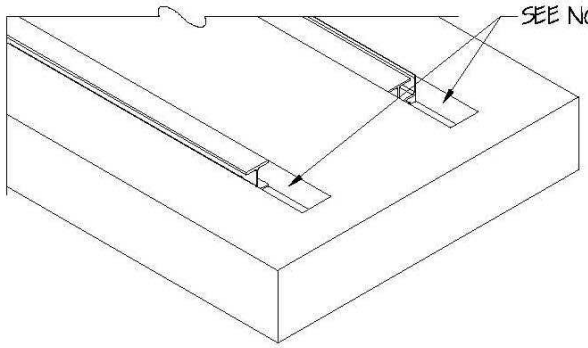
3. TRACK JOINTS SHOULD BE FLUSH ON TOP AND WELDED AS SHOWN BEFORE CONCRETE FOUNDATION IS POURED.



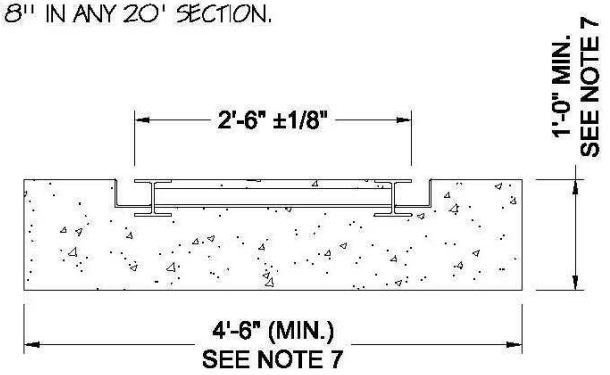
4. TRACK GRADE SHALL BE STRAIGHT WITHIN + / - 1/16" IN 20'. CHECK WITH A TRANSIT EVERY 4' EACH SIDE.



5. MAXIMUM SWEEP ALONG ENTIRE TRACK IS 1", WITH NO MORE THAN 1/8" IN ANY 20' SECTION.



6. ALLOW FOR OPENINGS AT EACH END OF TRACKS FOR CLEANING, DRAINAGE AND SAFETY CLIP INSTALLATION.



7. CONCRETE FOOTING SHALL BE SIZED AS REQUIRED BY A LOCAL ENGINEER IN ACCORDANCE WITH JOB SPECIFICATIONS AND SITE CONDITIONS.

HIGH SPEED OPERATOR ADVISORY:

Tymetal gates are of the highest quality and have over 25 years of trouble free experience being paired with gate operators running speeds up to 3 ft/sec. Operators that run faster than 3 ft/sec. may require special hardware, stops and installation methods - depending upon the gate size, weight and expected frequency of operation. There is a limit, depending on opening size, as to how fast and how frequent gates can be run and still remain 100% reliable. Please contact Tymetal for further information needed on gates expected to be used in high speed applications (> 3 ft/sec). Damage to gates caused by high speed operation that were not designed for high speed operation is not covered by the Tymetal warranty.