

Vehicular Bridges

Installation Guide





TrueNorth Steel recommends that the installing contractor conduct a preconstruction meeting in advance of bridge delivery to ensure that all parties are prepared and equipped with appropriate tools to unload, assemble, and set the bridge. This guide is meant to assist the installing contractor but is not necessarily inclusive of all steps, nor is it meant to address site conditions.

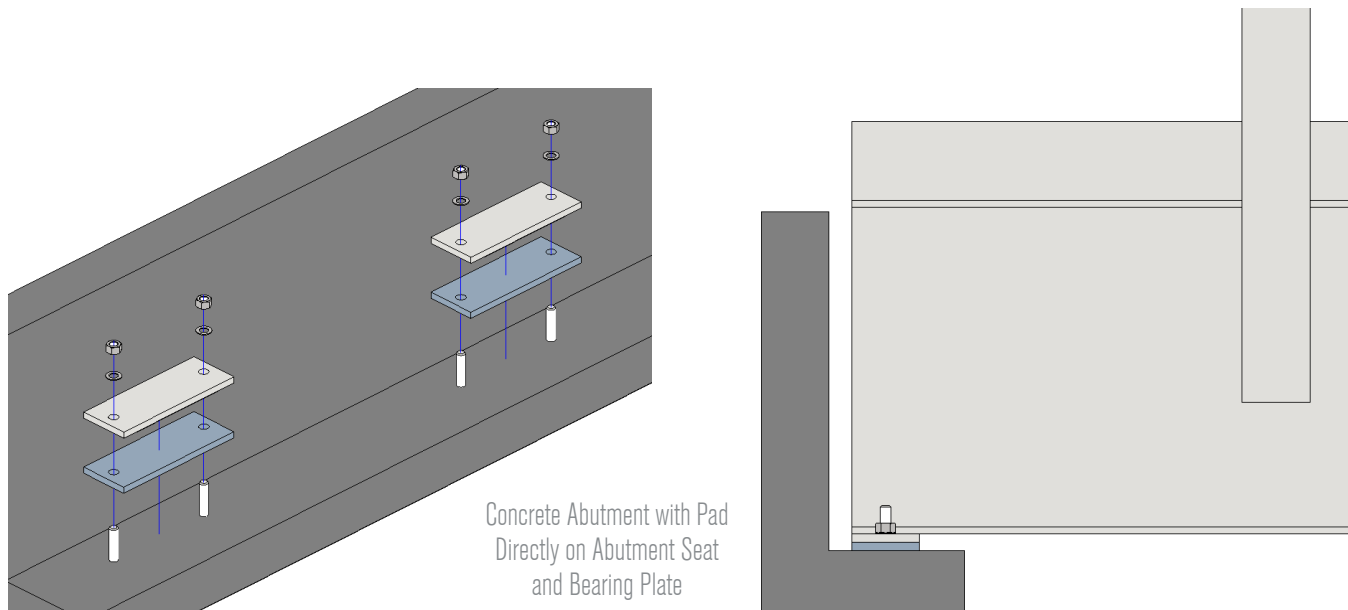
The installing contractor is responsible for all aspects of safety including setting and positioning of lifting equipment. Estimated lifting weights are shown on bridge shop drawings.

BEARING PREPARATION

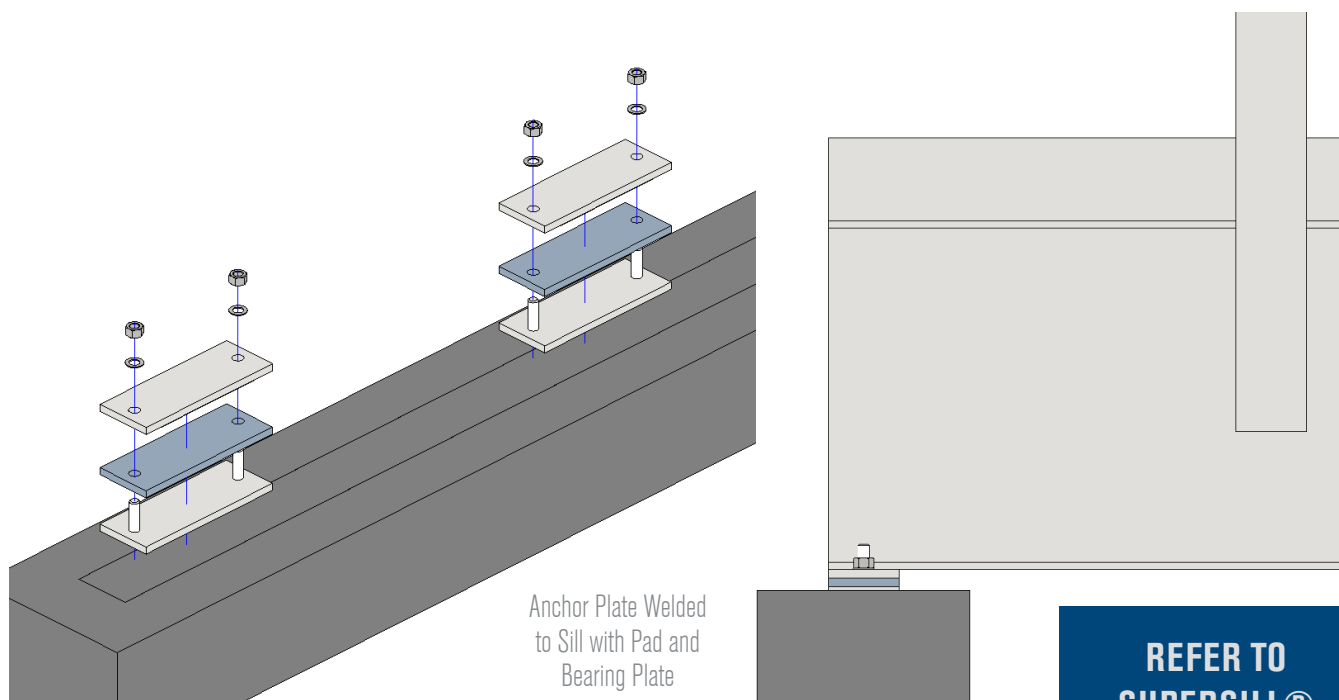
Prior to setting and splicing bridge subassemblies it is recommended that all bridge bearing assemblies be in place.

All bridge bearing plates, elastomeric leveling pads and anchor plates (required for precast sills or concrete filled SuperSill®) will be delivered loose along with the bridge.

For concrete abutment applications place the elastomeric leveling pad directly upon the abutment seat and then a bearing plate over the pad at each bearing location. For precast concrete or ballast filled sill applications, an anchor plate must be positioned directly upon the embedded sill plate and this anchor plate is to be welded in place prior to placing the elastomeric pad and the overlying bearing plate.



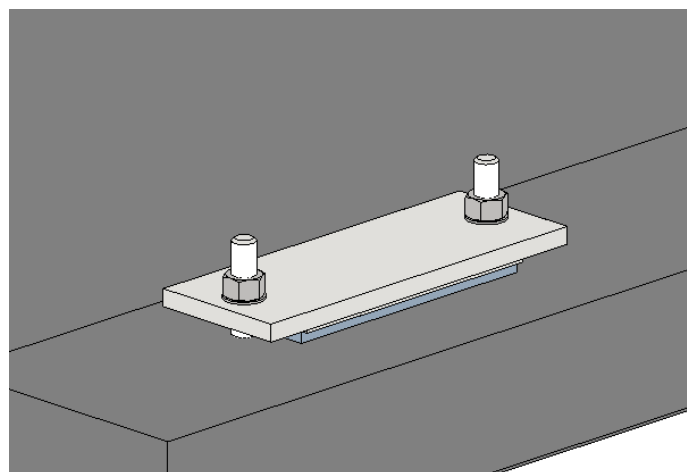
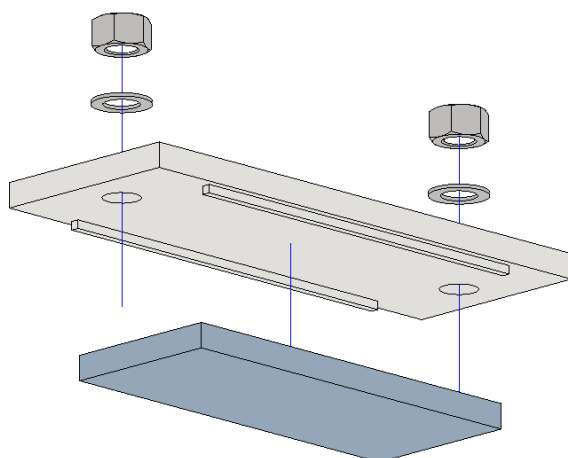
Concrete Abutment with Pad
Directly on Abutment Seat
and Bearing Plate



All bearing plates must be at the correct elevation, and ensure that there is uniform bearing between the abutment and leveling pad. If necessary, shim the plate with steel shims or use non-shrink grout under the entire bearing pad assembly in order to assure uniform bearing and the specified final elevation.

When layered elastomeric pads are specified, they will be supplied without anchor bolt holes and the bearing plates will include welded $1/4" \times 1/4"$ keeper bars to capture the pad. When positioning the pads, be sure to center them between both the bearing plate keeper bars and anchor bolts to prevent movement.

**REFER TO
SUPERSILL®
ABUTMENTS
FOR MODULAR
VEHICULAR AND
PEDESTRIAN
BRIDGES
BROCHURE**

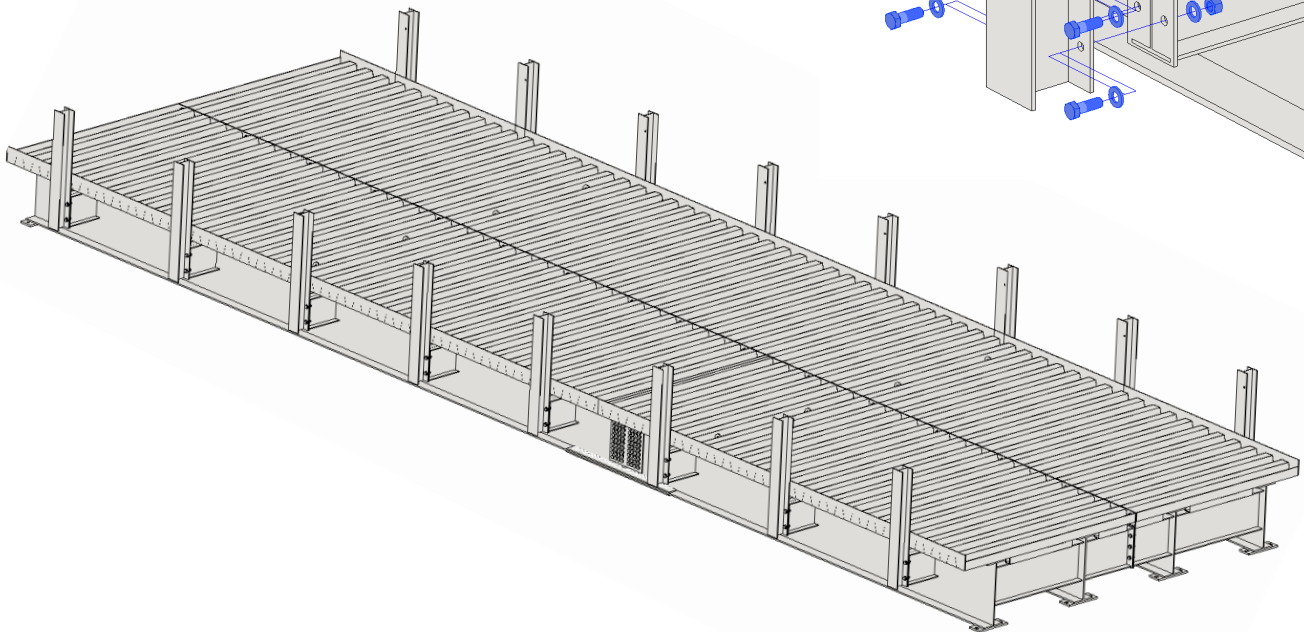
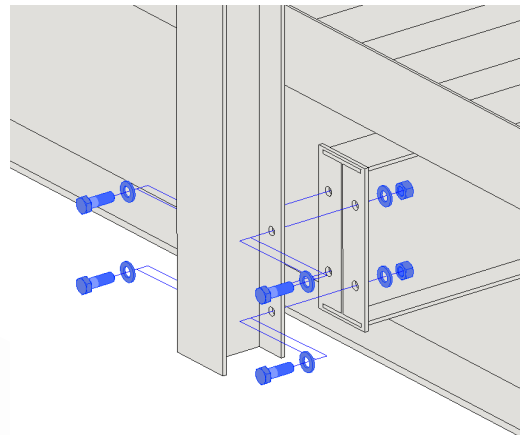


Refer to project drawings for any special instructions related to bearings.

GUIDE RAIL ASSEMBLY INSTRUCTIONS

Bridge guide rail and posts will be delivered with the bridge sections and at the installer's preference may be installed prior to, or after placement of the bridge sections.

Bridge guide rail posts shall be fastened to struts using hex head bolts. Each hole will receive one bolt, one washer, and one nut.



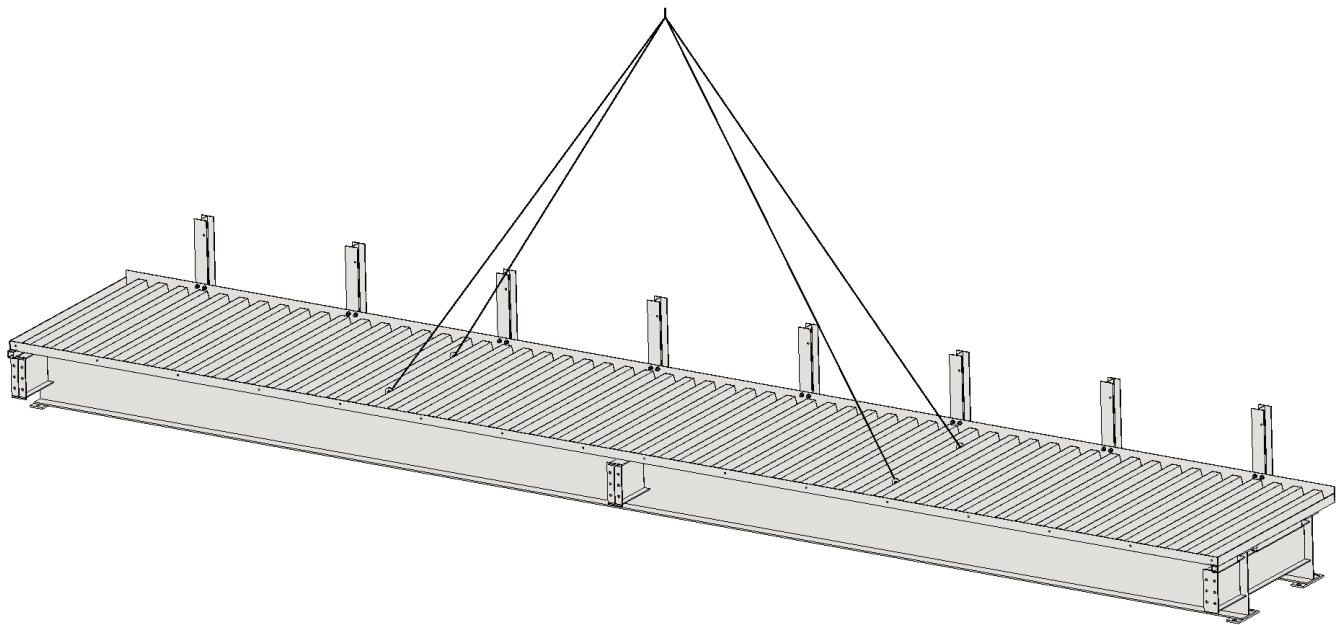
The guide rail is attached to the posts with either one button head bolt for w-beam guide rail or two button head bolts for thrie-beam guide rail. Each hole in the guide rail will receive one button head oval shouldered bolt, one reflector, one plate washer, and one recessed nut.

Guide rail splices and flared end sections shall be fastened together with button head bolts. Each hole shall receive one button head oval shouldered bolt and one recessed nut.

Refer to the drawings for special instructions related to guide rail.

BRIDGE COMPONENT LIFTING INSTRUCTIONS

Utilitilizing the pre-attached lifting lugs, the bridge sections may be lifted for unloading and setting. Refer to shop drawings for lifting lug capacity. A mininum of four (4) lifting lugs should be utilized. Lift angles less than 45 degrees are not recommended. It is also possible to lift bridge sections by attaching at the ends of the bridge near the bearing plate locations.



If bridge decking has not been pre-installed, bridge sections may be lifted utilizing four lift points at $1/4$ to $1/3$ span points as measured from the ends of the bridge section.

BRIDGE SETTING INSTRUCTIONS

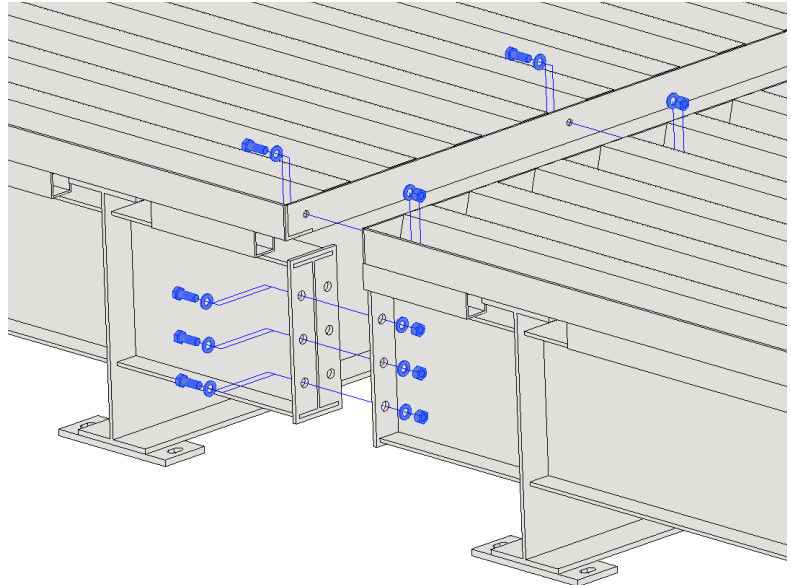
After setting of the bridge, ensure that spacing is equal at both ends or otherwise as directed in details shown on the shop drawings. If the bridge is designed with an abutment elevation difference, ensure the higher end of the bridge is set upon the higher foundation. Refer to the shop drawings.

Connect diaphragm splices and center splices using hex head bolts. Each of the hole on the splice plates shall receive one bolt, one washer, and one nut. See “Bolting” section for additional information.

Bearing plates are to be welded to the bridge stringers as detailed in the shop drawings.

Each bearing anchor bolt will receive one (1) washer and two (2) nuts. One end of the bridge is designed to be fixed and the nuts are to be installed tight. The fixed end of the bridge will have one bolt tighten according to the chart below. Expansion end will have two nuts per bolt. The first nut tightened finger tight to the washer placed on the bearing plate. The second nut will be installed tight to the first.

After bridge installation is complete; install backwalls prior to backfill, if not a poured abutment with integrated backwall.



PAINTED BRIDGES

When handling and installing painted bridges, the installing contractor must be careful to minimize damage to the painted finish. Padding should be used to protect the paint from chain, choker, or sling. It will be the responsibility of the installing contractor to perform any and all touch up painting from delivery, unloading, assembly, and setting, as necessary.

A nominal amount of touch up paint will be supplied. If additional paint is needed, TrueNorth Steel will assist contractor in locating a local supplier, for contractor purchase.

This is often an epoxy system and attention will need to be given to mixing and applying the paint products. Touch up must be applied to blend with factory application as much as possible. Please follow manufacturers latest recommendations found online.

BOLTING

Bolts supplied for assembly are high strength structural bolts. Common bolt sizes are 3/4", 7/8", and 1" diameters with respective socket sizes are 1 1/4 ", 1 7/16", and 1 5/8". All bolts should be installed loose and then tightened from the center of the splice, working to the ends of the splice.

Bolt tightening shall be in accordance with the Research Council on Structural Connections (RCSC) "Specification for Structural Joints using ASTM A325 or A490 Bolts" by using the turn-of-nut procedure described in the table below.

All bolts should be brought to a snug tight condition to ensure the individual plies of the splice joint are brought into contact with each other. According to RCSC, snug tight is defined as the tightness attained by a few impacts of an impact wrench or the full effort of a ironworker using an ordinary spud wrench. Once all bolts are brought to a snug tight condition, all remaining bolts shall then be tightened by the applicable amount of nut rotation as specified in the table below. During this operation, there shall be no rotation of the part not turned by the wrench.

Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance should be plus or minus 30 degrees. For bolts installed by 2/3 turn and more, the tolerance should be plus or minus 45 degrees.

If bolts do not smoothly engage to snug-tight there may be an obstruction within the threads. In this case, the bolt should be removed, the threads on the bolt and nut cleaned and retapped as needed, to allow smooth installation of the bolts.

| Bolt Length | Flat Surfaces Under Bolt Head & Nut |
|---------------|-------------------------------------|
| $\leq 4D$ | 1/3 Turn |
| $4D \leq 8D$ | 1/2 Turn |
| $8D \leq 12D$ | 2/3 Turn |

