

Onsite Horizontal Manual Column Assembly

A Tirfor Assembly Unit can be made available for column assembly for our client's upon request.

If problems occur during the assembly of the column(s), stop work and contact G&S Industries immediately on +61 08 9446 8044 or +61 08 9446 8338.

Purpose

The purpose of this technical instruction is to detail those actions necessary to ensure that G&S steel column sections are joined and assembled in compliance with the applicable design standards.

Scope

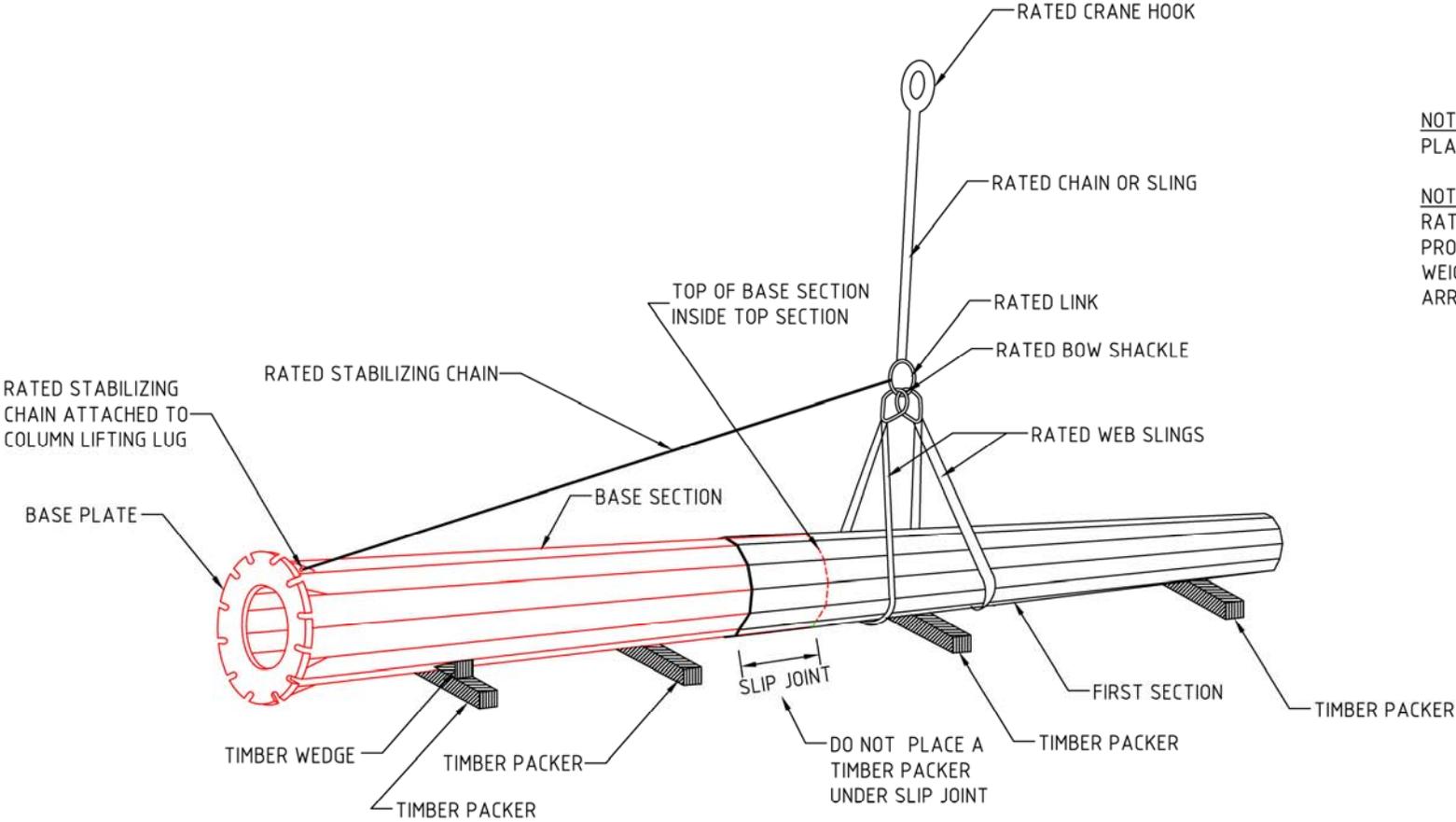
This procedure applies to the joining and assembly of G&S steel columns.

Due to the overall length of the majority of our Mid Hinged and Fixed Tapered Octagonal Columns, when delivered to site, some of our columns will require some degree of assembly. Please note that that this procedure is intended as a guide only, which is to be followed in conjunction with any currently existing site safe working / Worksafe regulations at the time of installation of the column.

Procedure Detail

1. Lay the column sections out onto wooden bearers so that the column's underside is level horizontally. Ensure that these wooden bearers are such a height so that the column's baseplate and headframe clear the ground. Also ensure that the

wooden bearers are spaced at even intervals so as to support each column section individually. Ensure that the bearers are not positioned under the slip joints prior to joining so as not to impede the horizontal movement required to join the column sections together. Make sure that the column base is wedged to prevent rotation. (See Figure 1) below. Ensure that the column sections are correctly aligned in relation to the doors, outreach arms and cable exit / access doors.



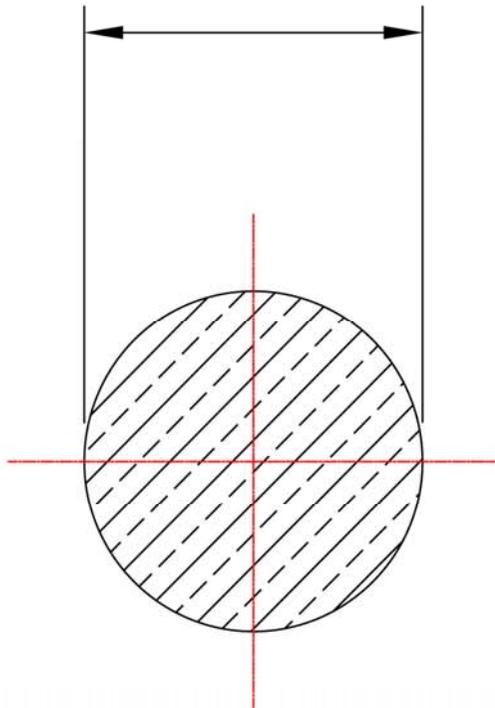
NOTE 1: TIMBER PACKER NOT TO BE PLACED UNDER SLIP JOINT

NOTE 2: ALL LIFTING GEAR IS TO BE RATED TO THE WEIGHT OF THE PRODUCT TO BE LIFTED. PRODUCT WEIGHT LOCATED ON G&S GENERAL ARRANGEMENT DRAWING.

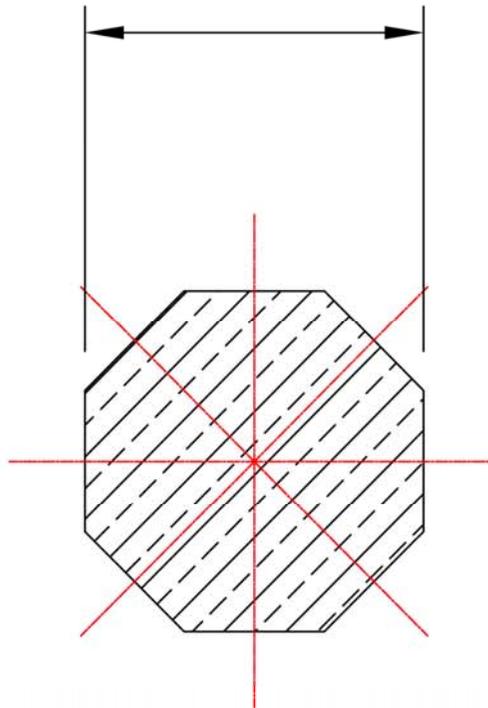
FIGURE 1

2. The slip joints are the joints where the column sections meet with the female end of higher section sliding over the male end of the lower section. The minimum slip overlap required on these joints is greater than or equal to 1.5 x the outside diameter (across the flats) of the male end of the slip joint of the lower section. (See Figure 6) below. **This 1.5 measurement is a minimum only and the sections should be joined together as tightly as possible to allow for manufacturers tolerances.** Mark this measurement on the male end of the lower section prior to joining the sections. If the final slip length is to be recorded, mark an additional spot which is equal to 2 x the outside diameter of the male end of the slip joint of the lower section as a measuring reference. If in the event that the minimum slip is not achieved, the assembly procedure should cease and G&S should be contacted immediately. Erecting a column which has been joined with less than the minimum required slip could result in serious injury to person(s) or damage to property.

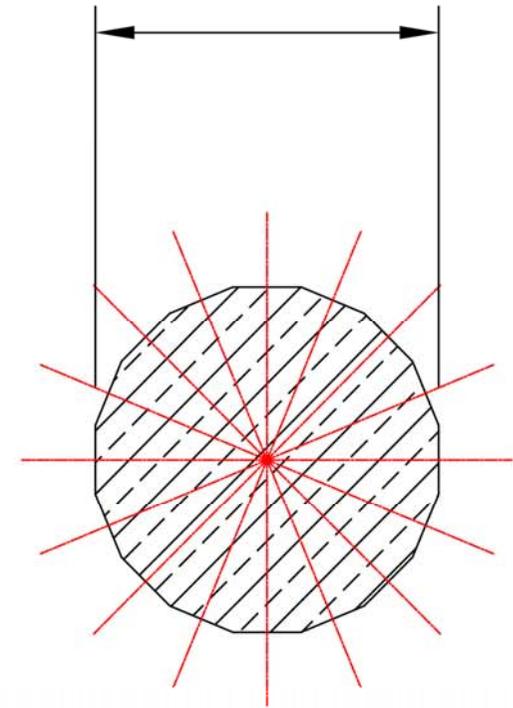
CIRCULAR OUTSIDE DIAMETER



8 SIDED OUTSIDE DIAMETER



16 SIDED OUTSIDE DIAMETER



3. Ensure the seam welds of the top and bottom sections are aligned. Then slide the female end of the section over the male end of the lower section as far as can be achieved using hand force only. Once this is achieved, two Tirfors as shown in the diagram above are to be used to assemble the two sections. This is achieved by positioning one Tirfor on either side of the column. Each Tirfor must be operated in coordination to ensure that the telescoping of the sections proceed evenly about the column axis. (See Figure 2) below.

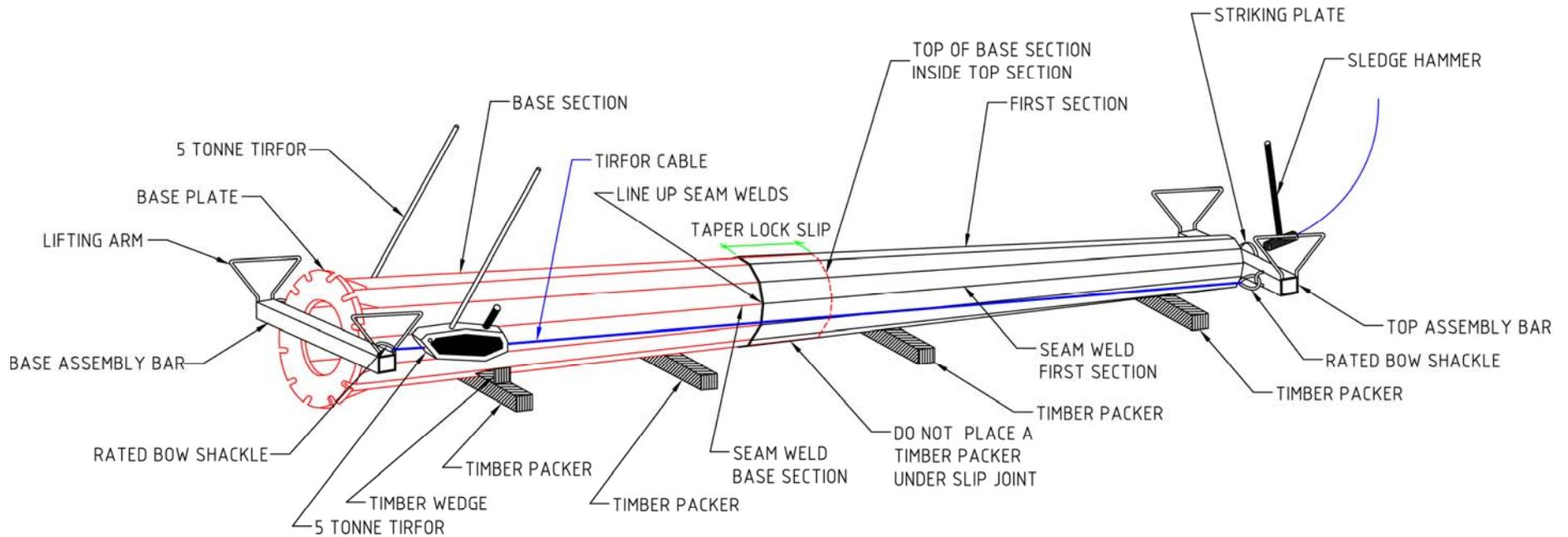


FIGURE 2

4. **Under strict supervision**, sections are to be joined together by applying a compressive force along the centre axis of the two sections. It is most important that the resultant compressive force is applied coincident with the pole axis, as any eccentric loading may result in a misaligned joint and / or may damage the pole sections due to additional bending stresses. In order to facilitate this, the sections are to be joined one at a time starting from the base sections working towards the top of the column. The female section being joined should be lifted to the correct level using a suitable sling at the section's centre of gravity, using a crane or other suitable lifting equipment and aligned with the male section of the joint. (See Figure 1) above. The telescoping of the two sections should continue until no further movement can be achieved.

The Tirfor assembly process may be aided by striking the "striking plate" as shown in the (Figure 1) above, with a sledge hammer. The external surface of the slip joints as shown in (Figure 3) below, can also be hammered using a wooden block and hammer to assist in achieving an adequate joint. The wooden block is used to prevent any damage to the galvanizing coating.

5. Visually check for air gaps at the slip joint. There should be no air gaps between the two sections after correct pressing.

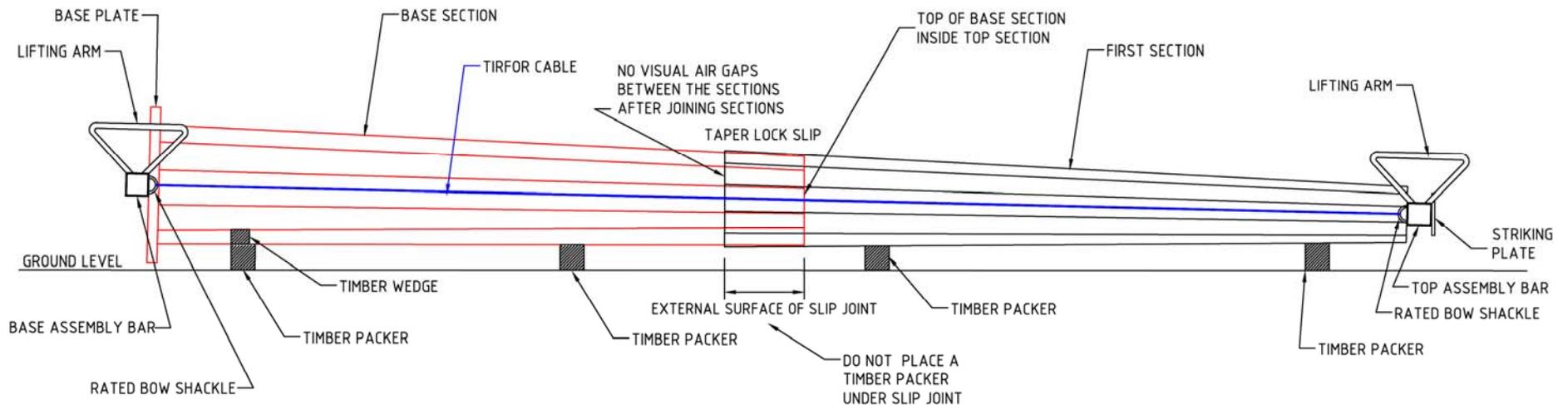


FIGURE 3

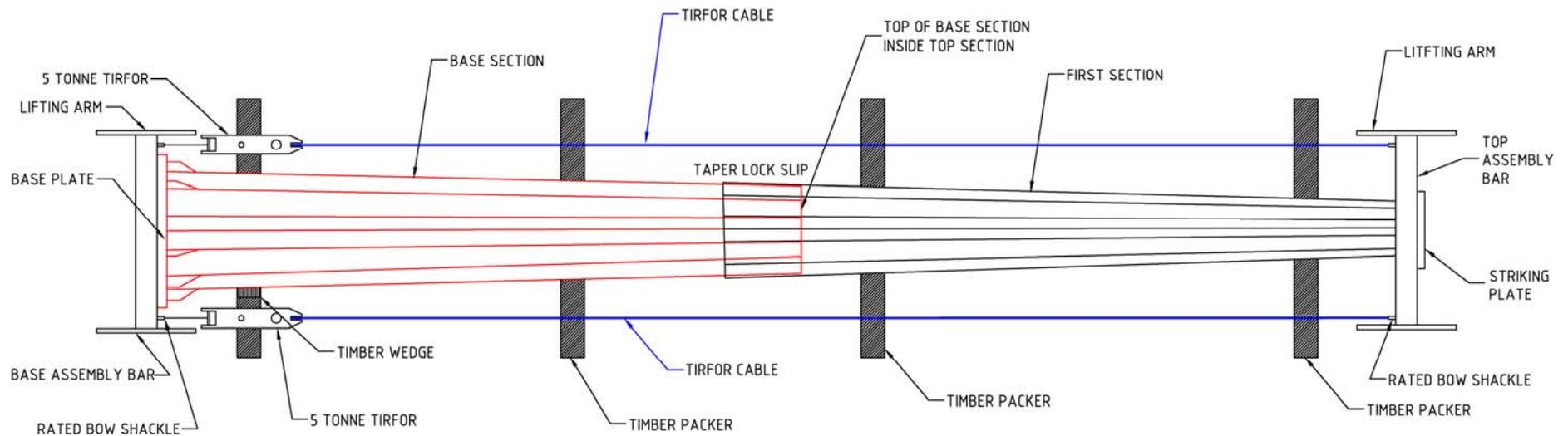


FIGURE 4

- The above process should be repeated separately for each additional section of the column, being careful to follow the same procedures as above, keeping the column and newly joined sections, horizontally level at all times.

7. On all our Mid Hinged Columns, for sections above the hinge / pivot point only, once the upper section has been properly pressed onto the lower section as per the instructions above. Drill a 17mm hole directly through the centre of the Taper Lock Slip Joint on any one of the octagonal flat faces. Then place 16mm grade 4.6 bolt through the holes and secure with a nut washer and spring washer as supplied with the column(s). (See Figure 5 & 5A) below. When fastening the M16 nut, the nut is to be tightened to a torque setting of 30N-m (3kg.m) utilising a calibrated torque wrench. **Under no circumstances does this bolt fixing act as a replacement for the correct pressing of the sections together as per the above instructions. This is an added fastening method to the taper lock system. All of the points in this procedure are to be strictly adhered to prior to installing this fixing bolt. If you do not achieve points 1 to 6 above, please cease the procedure and contact G&S Industries before proceeding any further.**

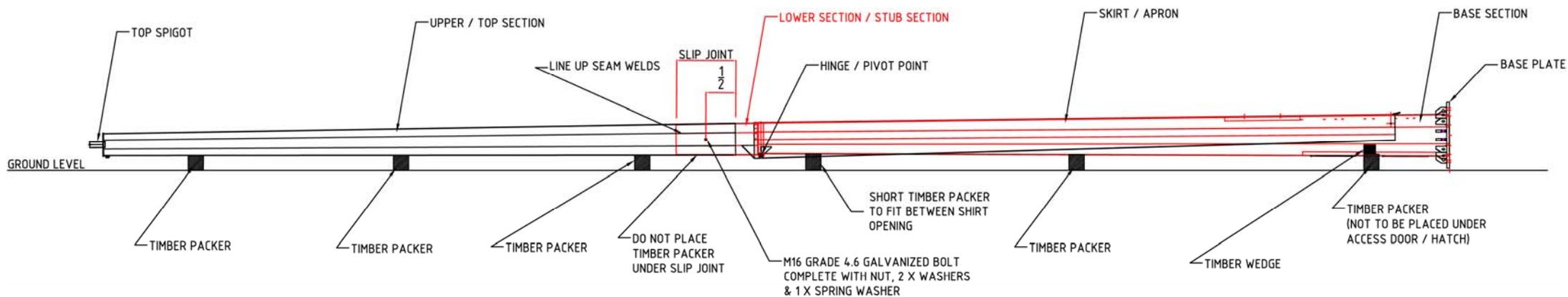


FIGURE 5

TIRFOR ASSEMBLY OMITTED FOR CLARITY

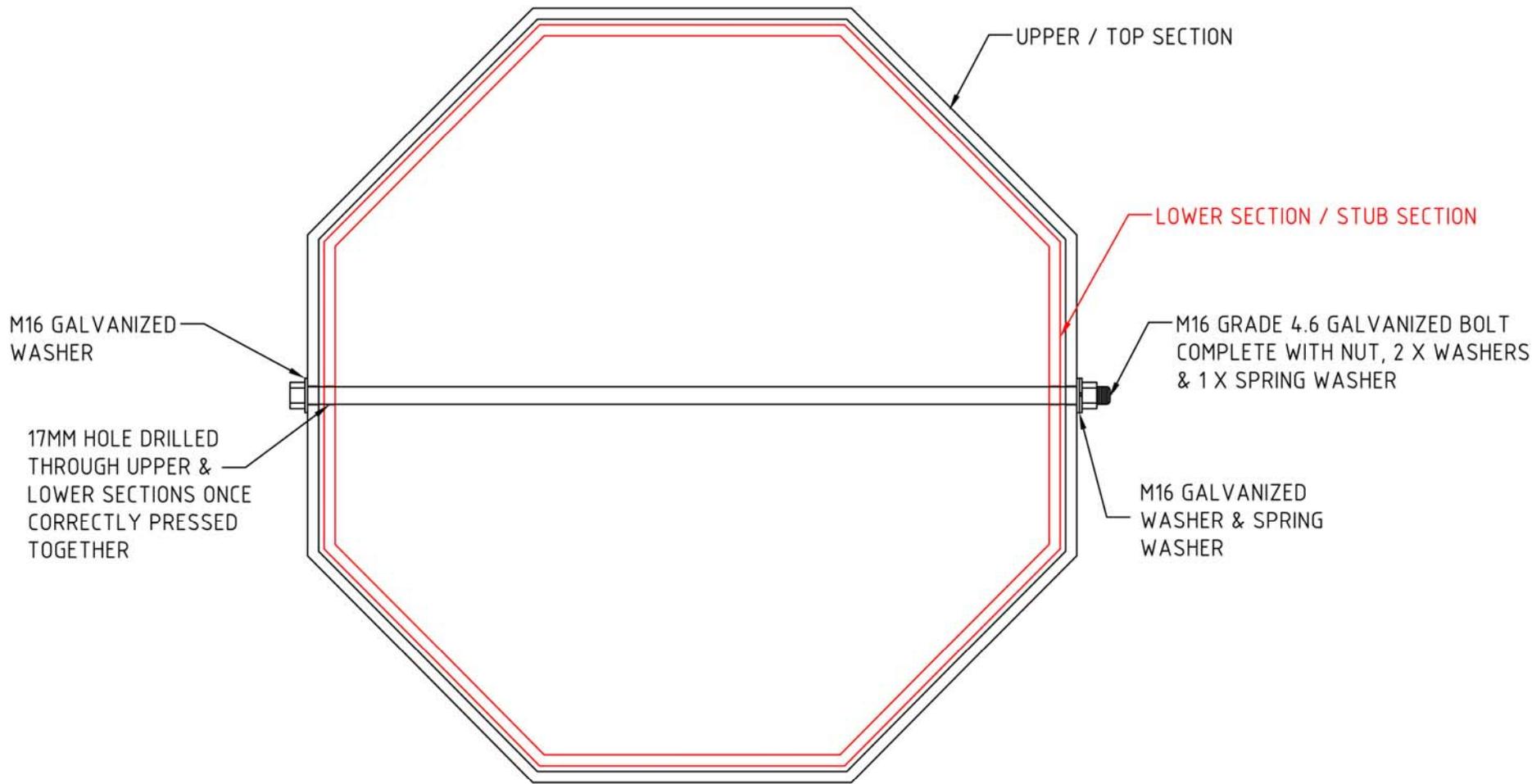


FIGURE 5A

8. All Mid Hinged Columns are provided with a chain and shackle arrangement welded to the top of the column adjacent to the column spigot. This is used as an additional attachment point for light fittings and other equipment in the event that their securing devices on the headframe fail during lowering of the column. For equipment that cannot be secured by this chain and shackle arrangement, such as spigot mounted light fittings, the procedure below is to be followed.

Once the equipment is mounted to the column spigot, a hole is to be drilled through both the equipment mounting spigot and pole spigot. Care is to be taken not to drill through the cables running through the column. Then a bolt is to be threaded through both the equipment mounting spigot and pole spigot and securely fastened. This will ensure that the equipment remains fastened securely to the column upon lowering the column.

For our Mid Hinged Columns, all headframes including client supplied equipment are to be mounted and secured to the column **PRIOR** to column erection. **Under no circumstances are the Mid Hinged Column(s) to be erected without their headframes / equipment attached with the intention of operating / lowering the column at a later stage to mount the headframes / equipment. This is dangerous and could result in serious injury to person(s) or damage to property.** Our Mid Hinged Columns are supplied balanced to carry their required head weight and are to be operated only when their specified equipment and counterweight are installed. (Please see our Mid Hinged Column Raising and Lowering Procedure) which is located on our website at www.gsindustries.com.au/product-procedures/default.aspx.

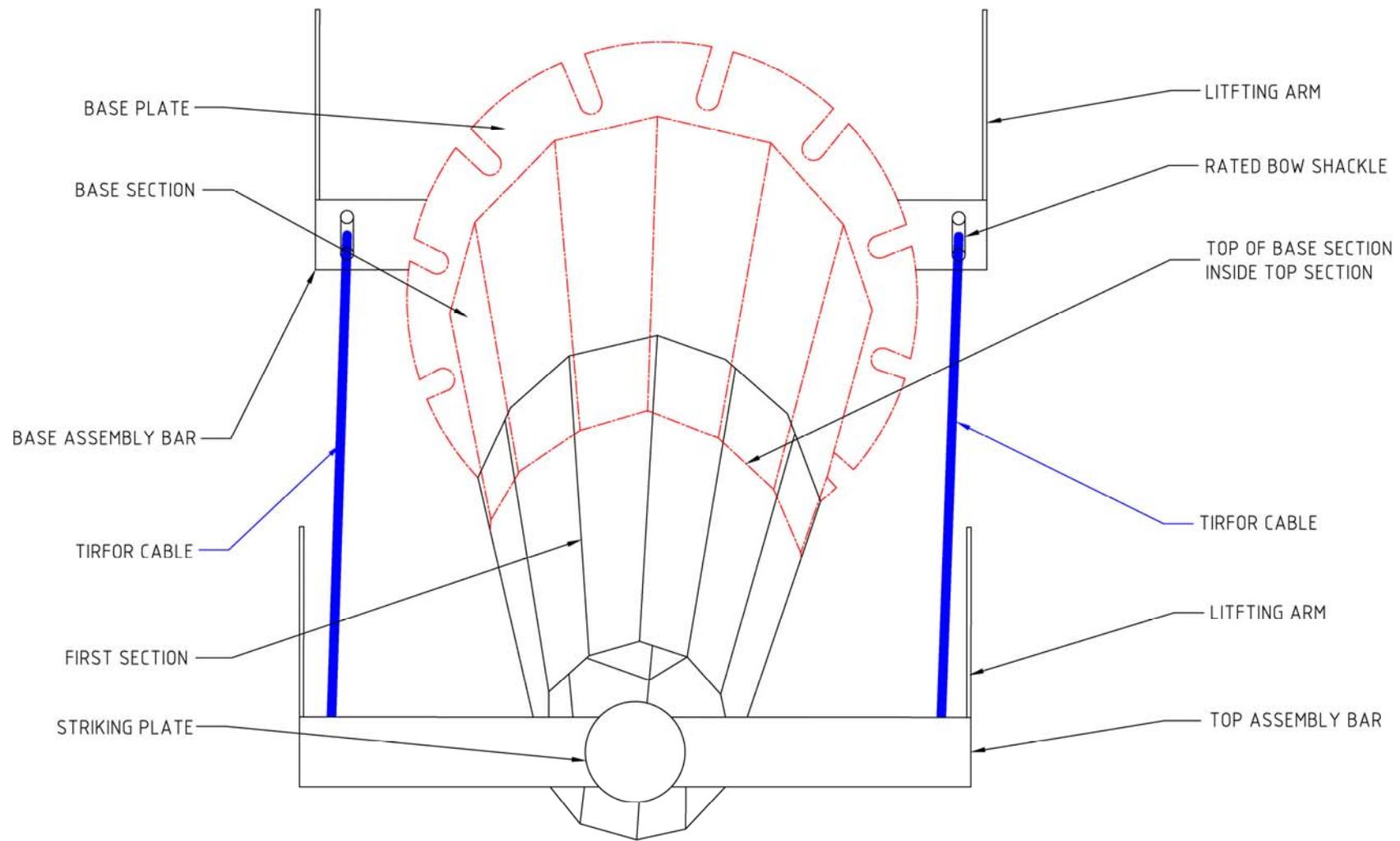


FIGURE 6