POLE ASSEMBLY & INSTALLATION

FOR STREET LIGHT POLES (FLANGED AND INGROUND)

1.0 GENERAL

The purpose of this technical procedure is to detail those actions necessary to ensure that Street Lighting Columns are joined in compliance with the applicable design standards.

Streetlight poles come in tapered sections, and these section lengths can vary depending on column height. They are joined by inserting smaller end of one section into the larger end of the one above. The distance that one slips into the other is known as the "slip length".
Two types of poles are common, flange based and inground, the former either going onto bolts cast into concrete, or bolted to a flanged ground stub.

For additional procedures specific to slip base bolt set installation, see separate GESS LTD DOCUMENT NO. **GVTG-002**

2.0 JOINING PROCEDURE

2.1 Arrange the sections onto packing so that the underside of the pole will be horizontal and the pole is adequately supported off the ground. Ensure the height of the packing is compatible with the assembled pole to provide adequate ground clearance and that there is a minimum clearance of 300mm from the end of each nominal slip length.

2.2 Wedge the sections to prevent accidental rotation.

2.3 Ensure the sections are correctly aligned in relation to the doors, outreach, cable exits etc.

2.4 Sling the section for assembly at its centre of gravity and engage the sections, making sure that perfect alignment is maintained. Only one section at a time is to be joined starting from the base section.

2.5 Make a temporary mark on the top face of the male section to indicate the specified slip length. Make an additional temporary mark 150mm beyond the specified slip length, noting it as slip + 150.

2.6 **Under strict supervision** join the two sections together by applying a compressive force along the central axis of the two sections. Ensure that telescoping of the sections proceeds evenly about the pole axis and no misalignment is present. Gradually increase the compressive force to 2,000 kg – at the same time the external surface of the slip joint shall be hammered via a wooden block to assist in achieving a good joint (care shall be taken to ensure the pole surface/coating is not damaged). Release the compressive force. *(Note: If a compressive force of 2,000 kg cannot be achieved for a particular reason, contact GESS LTD and advise the force achieved and the reason for not achieving the required force – GESS LTD will advise course of action).*
There are a number of different set-ups used to join pole 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 the additional bending stresses. Some common set-up's are shown in Figures 1a, 1b & 1c.

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FIGURE No. 1a

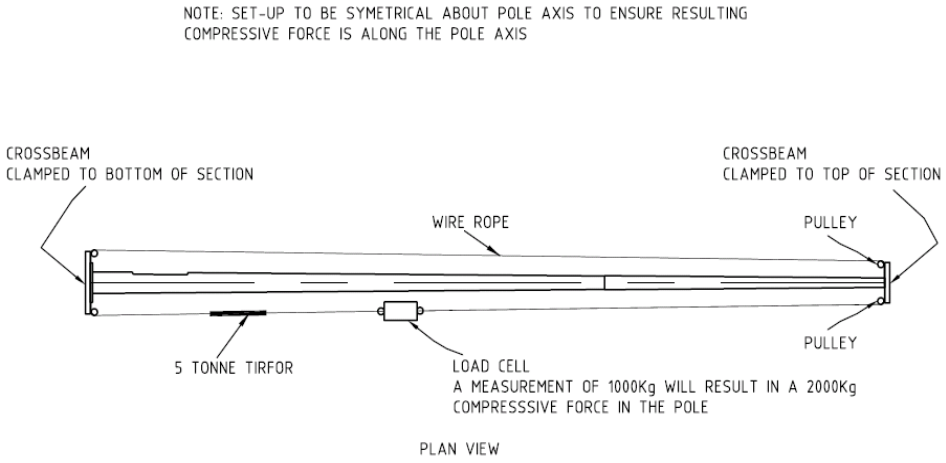


FIGURE No. 1b

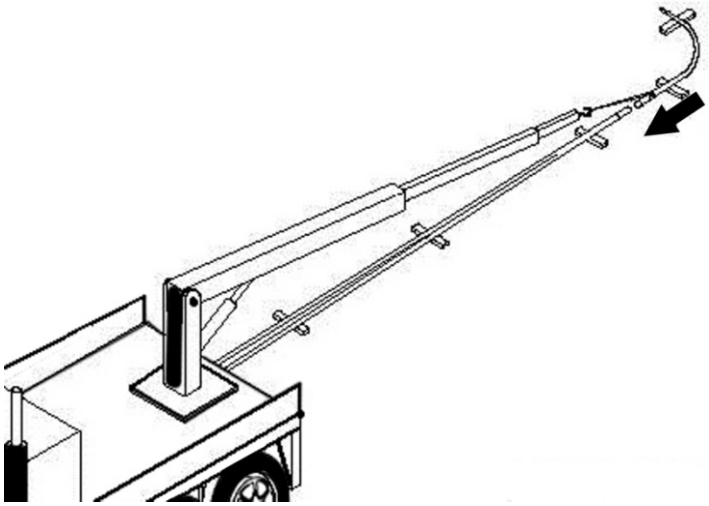
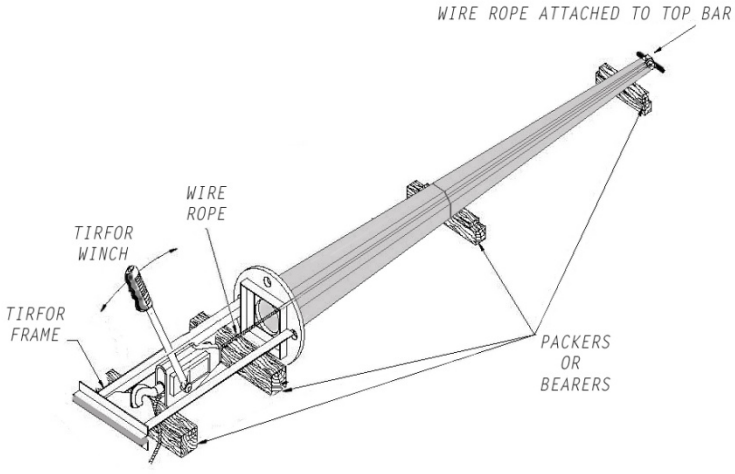


FIGURE No. 1c



2.7 Record the slip length achieved by reference to the marking positions previously applied. If the slip length achieved is less than 1.35 times the bottom internal dimension (across flats or internal diameter) of the female section, then notify GESS LTD for course of action.

2.8 Before removing the crane sling, pack up the newly assembled section to the required level ensuring that the packing is at least 300mm clear of the next joint to be made. At the same time re-pack and wedge under the new slip joint before removing the original packing and proceed in this manner until completion of assembly, keeping a careful check on alignment.

2.9 For the outreach, use the strop method to attach the outreach. Alternatively wedge the outreach against firm support, insert the top of the column section and use a hammer and wooden packer on the bottom of the column to achieve the required slip.

3.0 LIFTING PROCEDURE

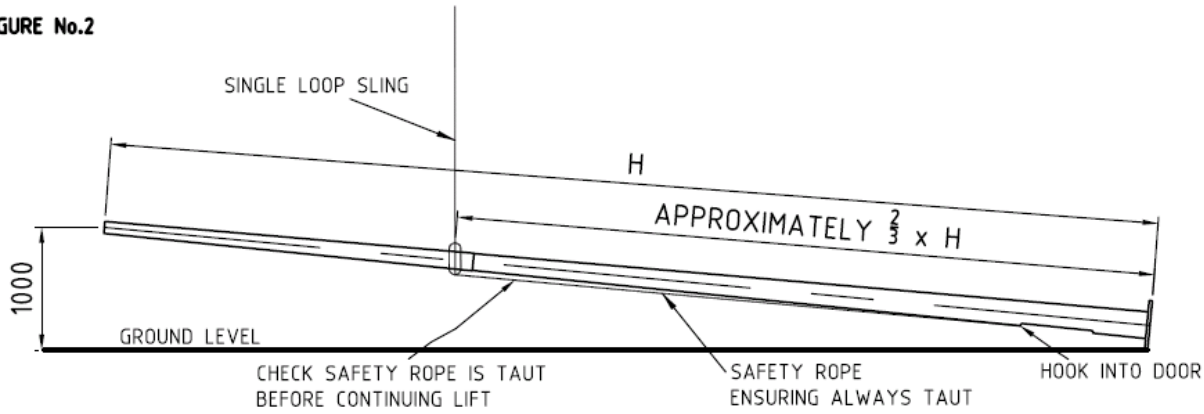
3.1 Ensure the column is correctly assembled prior to lifting (all necessary attachments/fittings are added and sections have been correctly joined).

3.2 Ensure all lifting tackle is checked for its capacity and adequacy for the weight of pole being lifted.

3.3 Attach a single loop sling around the pole at approximately two thirds of the overall height, taking care not to damage the pole finish (synthetic slings should be used for painted product). The sling shall not be wrapped tight around the pole.

3.4 On the opposite side to the lifting side, attach a safety rope from the sling and attach the other end to a hook which is to be hooked into the access door. Ensure the safety rope is taut at all times. Refer Figure 2.

FIGURE No.2



The purpose of the above arrangement is to prevent the sling from slipping up the pole while at the same time transferring all force parallel to the pole's axis back through the base of the pole (preventing sections from accidentally slipping apart). It is important that the sling is not tightly wrapped around the pole and that the safety rope remains taut at all times.

Note: *It is the operator's responsibility to ensure that the safety rope remains taut and the hook remains in position at all times until the pole is permanently secured to the footing. Avoid sudden or jerky movements.*

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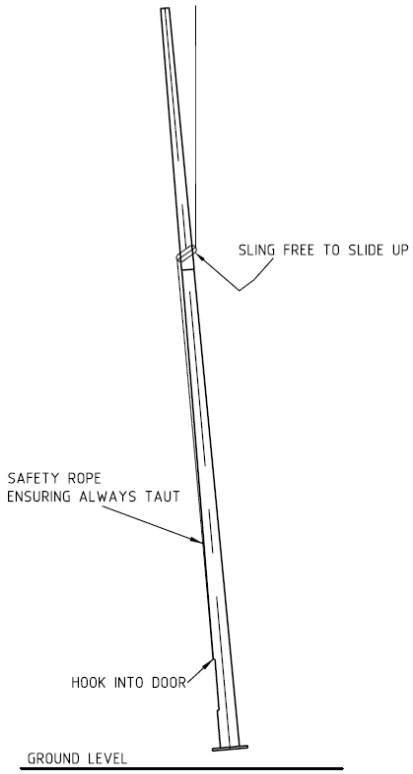
3.5 Begin lifting the pole. After lifting the top of the pole approximately 1m above the ground (base should still be supported on the ground), stop and check the arrangement. Ensure that the safety rope is still taut and that the sling begins to rotate around in-line with the lift. Refer Figure 2.

3.6 Continue lifting the pole ensuring that the safety rope remains taut at all times and that the sling continues to rotate around. Refer Figure 3.

FIGURE No.3



3.7 Carefully place the pole on the foundation bolts or ground stub. DO NOT release the load from the crane (safety rope is to still remain taut) until washers and nuts are placed on all threads and initially tightened (when foundation bolts are present) or when bolts and nuts are initially tightened on flange joints. When lowering onto threaded bolts, care must be taken not to "scour" or otherwise damage the threads.

For slip base installation, please see GESS LTD DOCUMENT NO. **GVTG-002.**

Unless specified otherwise, all nuts are be tightened "Snug Tight" (As per NZS3404). Snug tight is defined as a person using a 450mm long spanner or a few impacts with an impact wrench.

3.8 Release the load from the lifting crane – the lifting sling should loosen and the safety rope can be used to guide the lifting sling down the pole as the lifting crane cable is run down.

3.9 Remove lifting tackle.

4.0 PLUMBING AND GROUTING PROCEDURE

4.1 Plumb the column using the adjusting nuts. It is more important to have the top of the vertical part of the pole in line with the base of the pole rather than having the base plate level – particularly so for poles with single outreaches and loading on one side which will exhibit a natural 'bowing'.

4.2 In hot weather poles will become hotter on the side facing the sun. Due to thermal expansion differences, a temporary curvature of the pole could occur, Pole plumbing in such weather conditions is best done early or late in the day.

4.3 Tighten all nuts to the underside of the base plate and tighten down the corresponding nuts above the base plate.

4.4 Where foundation bolts are cast in, fill the space between the base plate and the foundation with a non-shrink general purpose construction grout – following the manufacturer's instructions.

4.5 Clean up area