

Pole Assembly & Installation

For Street Light Poles

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

1.0 Check Procedure for Supplied Joined Sections

- 1.1 The pole sections may be supplied joined by INGAL EPS or may require on site joining. Generally, joined sections that are no longer than 12m in overall length may be supplied joined by INGAL EPS; subject to contractual agreements or at the discretion of INGAL EPS.
- 1.2 Ascertain whether the poles supplied have been supplied joined by INGAL EPS. If supplied joined by a third party, ascertain that the correct joining procedures, as below, have been followed.
- 1.3 Visually and physically check any supplied joined sections to ensure the slip joint is tight – if the method used to join the supplied sections can not be determined (i.e. if joined by a third party and not by INGAL EPS) and/or the slip joint does not appear to be tight then re-apply the joining force as per the joining procedure below.

Note: Physical checking will simply involve pulling and rocking the two sections by hand and is intended to identify any sections that have clearly not been compressed together.

2.0 Joining Procedure

- 2.1 Arrange the sections on to 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 can not be achieved for a particular reason, contact INGAL EPS and advise the force achieved and the reason for not achieving the required force – INGAL EPS 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. A particular set-up is shown in Figure 1.

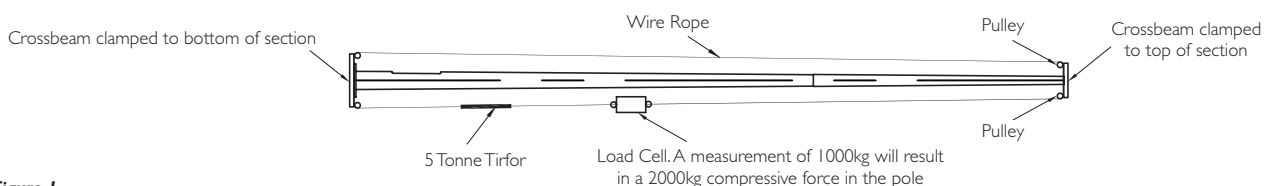


Figure 1.

Note: Set-up to be symmetrical about the pole axis to ensure resulting compressive force is along the pole axis

- 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 INGAL EPS 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.

3.0 Lifting Procedure

- 3.1 Ensure the column is correctly assembled prior to lifting (all necessary attachments/fitings 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.

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.

- 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.
- 3.7 Carefully place the pole on the foundation bolts. 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.
- 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.

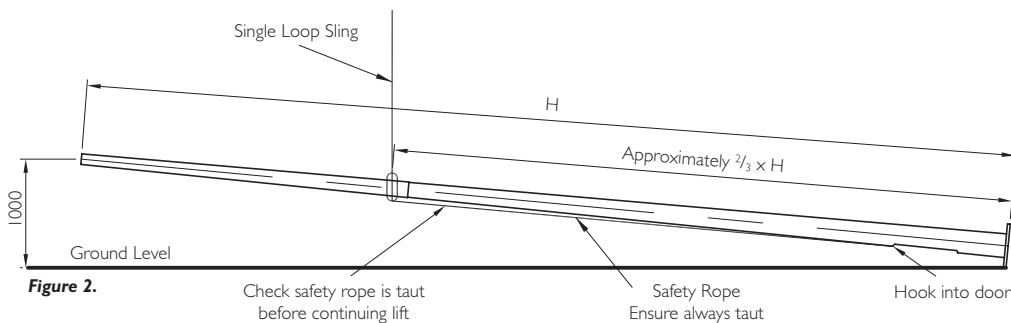


Figure 2.

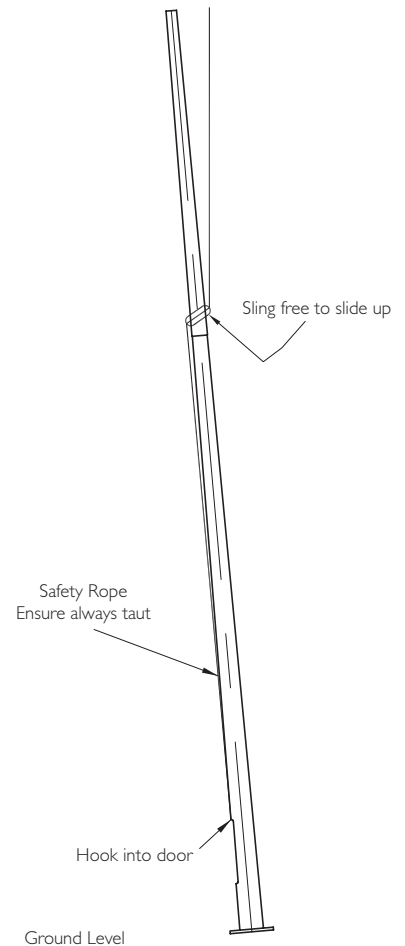


Figure 3.



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 Tighten all nuts to the underside of the base plate and tighten down the corresponding nuts above the base plate.
- 4.3 Fill the space between the base plate and the foundation with a non-shrink general purpose construction grout – following the manufacturer's instructions.
- 4.4 Clean up area.

