

## LARGE COLUMN ASSEMBLY & INSTALLATION

### FOR FLOODLIGHT, UTILITY, POWER & HIGHMAST COLUMNS

#### 1.0 GENERAL

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

Columns come in tapered sections, these section lengths can vary depending on column height. They are joined by inserting the 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". The theoretical slip length is detailed on the drawings of the column being assembled. Please ensure you have a copy of these drawings prior to assembly.

Two types of poles exist, flange based and inground, the former being the most prevalent, usually going onto bolts cast into concrete.

#### 2.0 JOINING PROCEDURE

- 2.1 Arrange the base section onto the packing with the access opening on the top and levelled so that the underside of the column section will be horizontal. The height of the packing must be compatible with the baseplate and the head frame dimensions so that both will be clear of ground when assembled. Seam welds of the column sections and climbing rung clips, if applicable, *must be aligned along the length of the column*. Refer to Diagram 1.

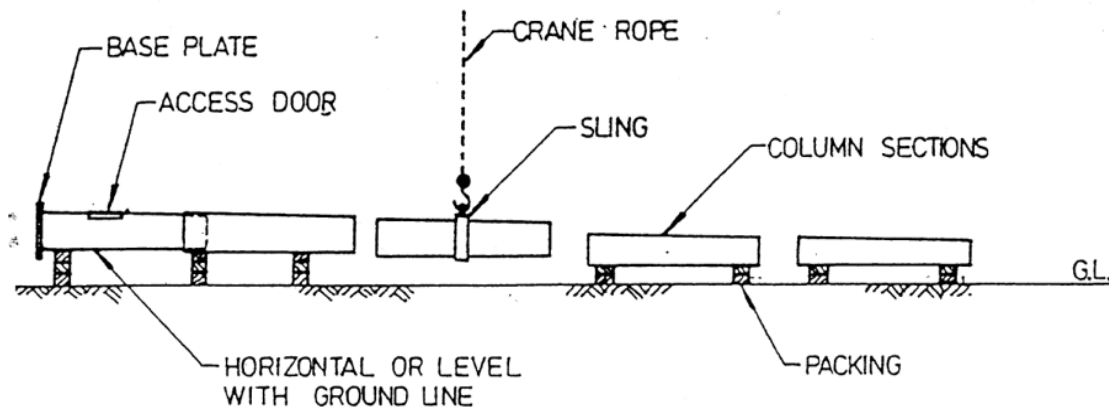
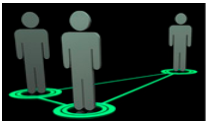


DIAGRAM 1

- 2.2 Wedge the baseplate to prevent accidental rotation.
- 2.3 Ensure the sections are correctly aligned in relation to the doors, outreach, cable exits etc. Check that the packing has a minimum of 300mm clear of the slip joint length shown on the drawings to allow for any horizontal movement of the column during assembly.
- 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.



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- 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 **Assemble two 3 tonne lift – 5 tonne pull tirsors, one each side of the column, anchoring one end to the baseplate or the cross beam. At the end of the column section being assembled a heavy steel section cross beam is arranged, blocked up in the horizontal plane on the column centre line while the tirror cables are attached as shown in Diagram 2. Noting only one section of the pole is assembled at a time starting from the base section. For columns 20m and below, a single central 5 tonne tirror may be used.**

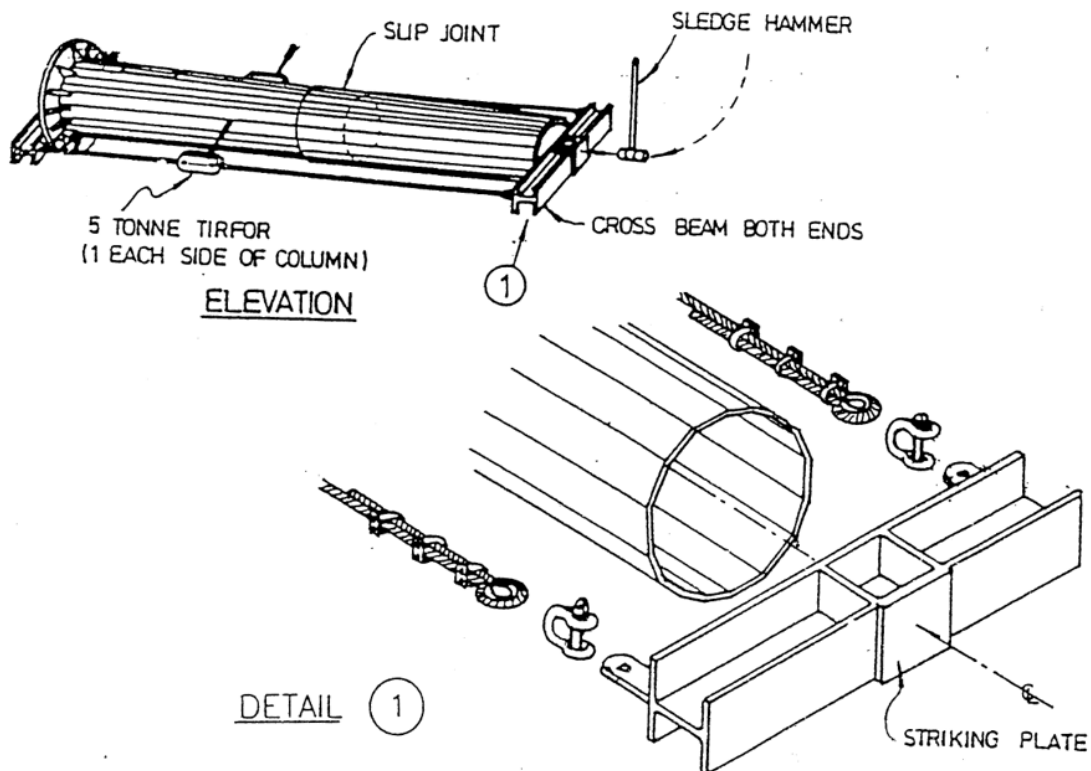
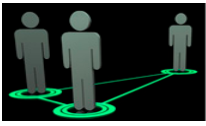


DIAGRAM 2

- 2.7 **Under strict supervision** operate the tirsors in co-ordination to ensure that telescoping of the sections proceeds evenly about the column axis. During this operation the cross beam can be hammered on the striking plate, Diagram 2, and the external surface of the slip joint can also be hammered via wooden block to assist in achieving a good joint.
- 2.8 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.



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- 2.9 Check the theoretical slip joint length with respect to the actual slip joint length and continue to apply pressure as described in 2.7 **until no further movement can be achieved.**
- 2.10 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 repack 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.
- 2.11 For Seesaw columns only, slip joints above hinge to be additionally secured with 2 tek screws – refer Diagram 3.

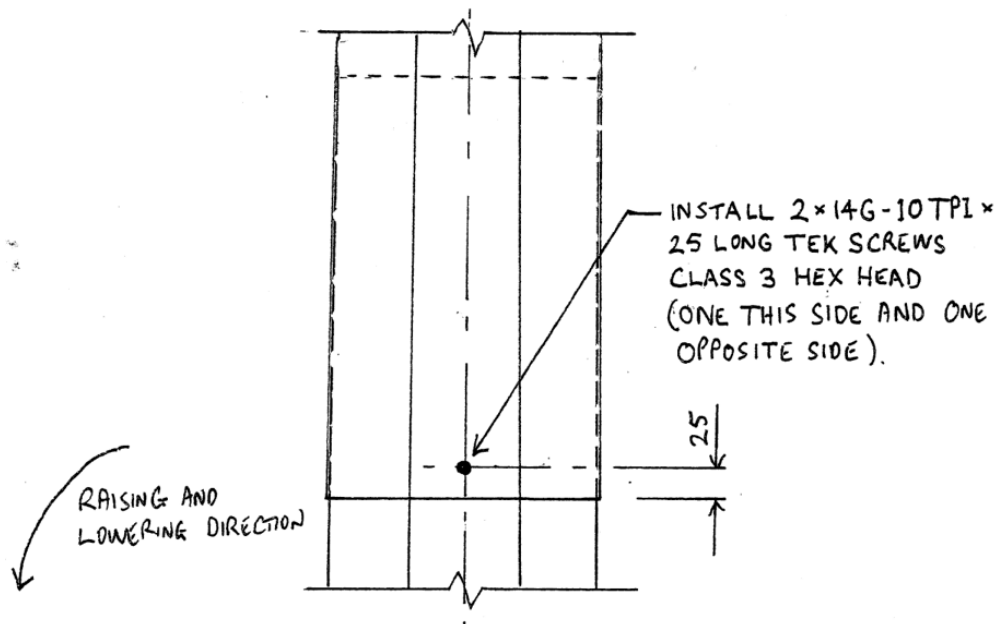
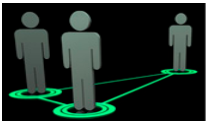


DIAGRAM 3

### 3.0 ERECT/INSTALL PROCEDURE

- 3.1 The column foundation, supplied by others, must be designed and constructed in accordance with the applicable Standards to ensure that the column is appropriate to the Column design parameters.
- 3.2 Before pouring the foundation it is recommended that the steel template supplied with the bolts be used to ensure that the bolts are correctly centred and vertical. The protruding portion of the bolts should be coated with grease and protected by a cap.
- 3.3 Thread a nut and place a washer onto each of the anchor bolts so that they are under the column baseplate and clear of the top of the concrete by approximately 30mm.



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- 3.4 Adjust two pair of nuts diametrically opposed at 90 degrees so that they are 10mm higher than the remainder and level with each other. These four nuts will provide a means of obtaining vertical plumbing of the column – refer Diagram 4.

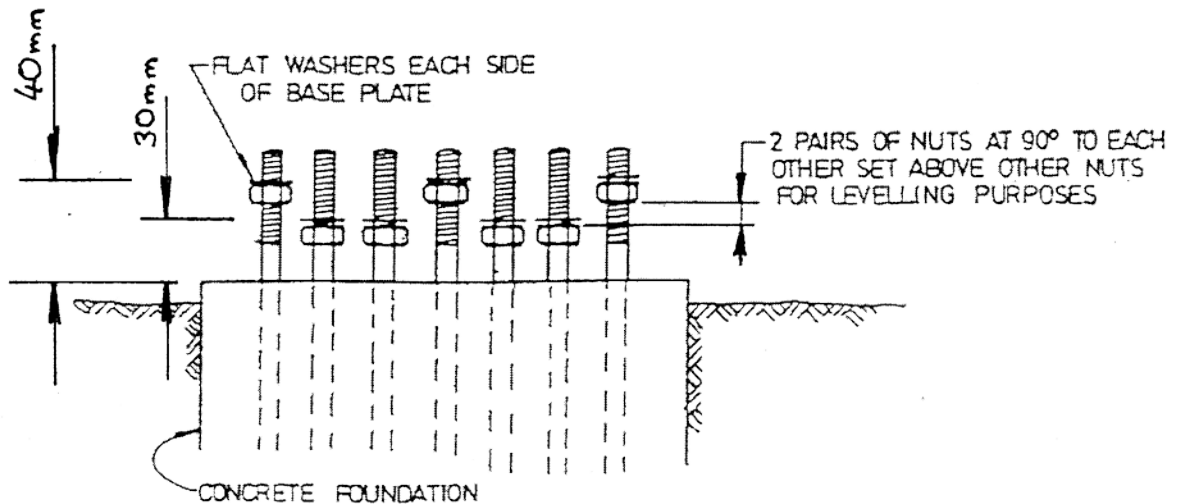


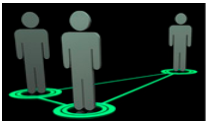
DIAGRAM 4

- 3.5 Centre the lifting crane (A) as shown in Diagram 5. Attach a sling or chain formed into a noose arrangement at approximately  $\frac{2}{3}$  of the column height from the base. Attach a tirlor between the lifting lug on the baseplate and the lifting sling.

The purpose of the above arrangement when lifting is to allow the noose sling to tighten around the column and the tirlor to stop the noose sling from slipping up the column while also transferring the lifting force back to the pole base.

All lifting tackle must be checked for its capacity and adequacy for the mass of pole being lifted.

- 3.6 For larger columns it may be necessary to use a small mobile crane (B) to “tail in” the base end of the column as the main crane (A) is lifting. This will avoid the baseplate dragging on the ground and maintain control of the base until the pole is held vertical by the lifting crane.
- 3.7 Before lifting the column, mark the baseplate and foundation to ensure that the headframe and lighting array will be correctly orientated.
- 3.8 If necessary, rotate the column on the packing prior to lifting to facilitate the orientation.
- 3.9 Following the above, the column may now be lifted onto the foundation bolts. TAKE CARE NOT TO DAMAGE the bolt threads.



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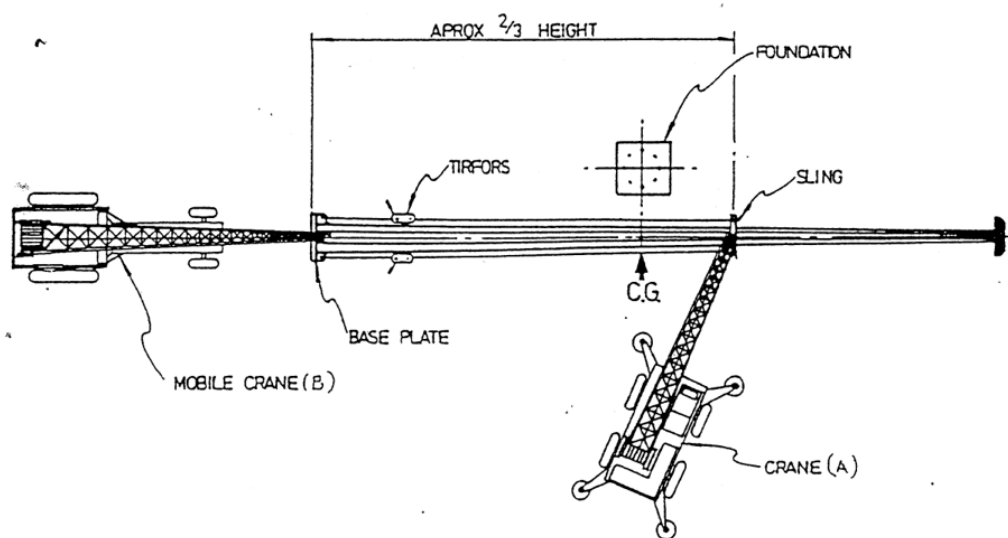


DIAGRAM 5: PLAN VIEW

- 3.10 With the column now erected on the foundation, place washers and nuts on all bolt threads.
- 3.11 Release the load from lifting crane (A). At this point the lifting sling noose should loosen and the tirfor rope can be used to guide the lifting sling noose down the column as the lifting crane cable is run down.
- 3.12 Remove lifting tackle.
- 3.13 Plumb the column using the adjusting nuts.
- 3.14 With the column vertical, tighten all nuts to the underside of the base and tighten down the corresponding nuts above the baseplate.
- 3.15 Fill the space between the baseplate and the foundation with a non-shrink general purpose construction grout.

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