



## Assembly and Installation Instructions for Spunlite Streetlight Pole

### Overview.

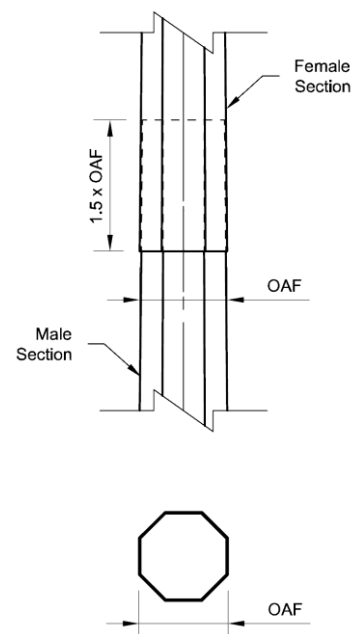
Spunlite poles are made up of galvanised tapered sections, usually octagonal (8 sided) in shape.

The standard section lengths are 3.6m long but can range vary depending on the height of the pole. The pole is built by joining the smaller end of one section into the larger end of the section above to achieve the required height.

A friction joint is created between the two sections. The length of this joint is designed to be 1.5 x the across the flats (ATF) dimension of the bottom of the female section. Refer to Figure A.

The friction joint provides sufficient strength at the joint and nothing else is required for strengthening.

The column comes with an outreach that joins to the top section of the pole. Outreach configurations are curved, mitred or elliptical and they generally range in length from 1m to 4m in length.



**Fig. A**

### Receipt of Consignment

Check the consignment to prior to receipting the consignment that items are correct for quantity, type and condition against delivery consignment note.

For ground plant poles these are packed nested with the largest section on the outside identified by having a protective coating. Flange based poles will have one section with a flange that sits separately from the other nested sections. Note if the sections are painted they will not be packed nested.

## Assembly Methods

There are three main methods that can be used to assemble Spunlite Tapered sectional Poles, the type of pole to be assembled will determine which method is used.

• Sledge Hammer method	For Pole height sup to 12m & steel thickness of up to 2.5mm.
• The Strop method	For attaching streetlight Outreaches, or for Column height up to 12m & steel thickness of up to 2.5mm.
• The Winch method	Can be used for all Pole heights and only method for Poles above 12m or steel thicknesses 3mm or thicker.

Poles must be assembled on a flat surface before erecting or lifting into place as one complete unit. Do not assemble poles in a vertical upright position.

Assembly always starts with the base section. The pole must be assembled one section at a time and each lap joint is fully tightened before progressing to the next section.

During assembly monitor the pole at all times ensuring the vertical and horizontal plans remain straight.

**Before assembly commences undertake the following preparations:**

### 1. Equipment



General (All Columns):

- Wire Cutters (To cut packing straps).
- Timber Bearers.
- Sledge Hammer and Timber Packing.
- Wooden Mallet.
- Tape Measure and Marker Pen.

Streetlight Columns Incorporating An Outreach Arm:

- All General Equipment as above.
- Steel Wire Rope (1) (Approximate length equals the mounting height of the Column plus the Outreach length plus 1m).
- 2 Tonne Tirfor Winch (1).
- Soft Strop (2).

Note(1) : Needed for Winch method only.

Note(2) : Needed for Strop method only.

Columns 12m Mounting Height Or Higher, And/or 3mm Steel Gauge or Thicker.

- All General Equipment as above.
- Steel Wire Rope (Approximate length equals the length of the Column plus 3m)
- One or two 5 Tonne Tirfor winches or rigger hoists. (Two Winches/Hoists generally required for Columns 30m in height or higher and/or 6mm steel gauge or thicker) Tirfor Frame.

## 2. Site Preparation

Pole assembly should be undertaken with the pole base as close as practical to the final location on a level well compacted surface.

## Assembly Methods

### Sledgehammer Method

This procedure applies to Spunlite poles 12m or less mounting height and manufactured in maximum of 2.5mm thick steel. For floodlight poles that have a cross arm fitted steps 8 and 9 are not applicable.

1. Assemble the columns on a level piece of ground as close to the final installation location as possible. Check the ends of the sections for any damage or galvanising build ups that might hinder the friction joint.
2. Place the bottom section on timber packers with the base up against a solid object such as a wall or solid section of curbing (place a section of wood between the section and the solid object to protect both the pole section and the solid object) and place wedge blocks at either side of the section to stop it rolling during assembly.



Ground Planted



Flange Based



3. Mark out the 1.5 x AF distance on the male end of the section. It is also prudent to make another mark further down the section just in case the correct overlap mark is well exceeded (in some cases the 1.5 x AF mark will be covered by the second section). The minimum acceptable overlap of the two sections is 1.3 x AF. Please contact your local Spunlite Territory Manager if this cannot be achieved.

4. Place the next section of the pole again on timber packers just up from the first section. Where possible it is recommended that the seams from the second section are 90 degrees rotated from the first section.



5. Pull/slide the second section back over the top of the first section and push down the pole as much as possible trying to keep the sections as straight as possible. Place another bearer under the top of the second section to keep the sections on the same level.

6. Check to ensure the two sections are straight, looking up the pole from the bottom along the top and side planes of the pole. This is

important, to keep the pole straight during assembly. By using bearers of the same size as you work your way up the pole. It will help keep the pole straight in the side plane.

7. Ensure the sections are in alignment looking down the pole (straight and level). Place a thick section of timber across the top of the upper section. Using a sledge hammer or large wooden maul strike the section of timber driving the upper section onto the lower section. Ideally target to be impacting the timber in the middle portion of the steel section to keep forces equal on all sides and reduce the risk of the section folding over at the top edge (the large piece of timber will likely start to break apart, so have plenty of spares available). Keep driving the upper section tighter on the lower section, until there is no movement occurring when the impacts occur (this can be checked by drawing small lines on the top of the exposed lower section and observing for movement during the impact process).



8. Care needs to be taken with this method, to make sure the top of the upper section is not damaged during the impacting process. Make sure the top edge does not get bent over, as this can cause problems of the next section to be added. Check that the minimum overlap of 1.3 x AF has been achieved (ideally targeting a 1.5 x AF).
9. Follow steps 3-8 for the addition of more sections until the pole is assembled. With the addition of each section make sure there are sufficient timber bearers under the pole (at least one per section). This will prevent any sags and curves forming while the pole is being assembled and will facilitate a smoother assembly process.
10. The last step is to add the outreach. In some cases, it may not be possible for the loop at the end of the Tirfor cable to pass through the spigot at the end of the outreach. In this case it may be necessary to use a strop or sledgehammer to attach the outreach. These methods will be covered below.



## Tirfor Winch Method

1. It is best to assemble the columns on a level piece of ground as close to the final installation location as possible. Check the ends of the sections for any damage or galvanising build ups that might hinder the friction joint.
2. Place the bottom section on timber packers with the base next to the frame or brace for the Tirfor and place wedge blocks at either side of the section to stop it rolling during assembly.



3. Mark out the  $1.5 \times \text{ATF}$  distance on the male end of the section. (this also applies to the outreach) It is also prudent to make another mark further down the section just in case the correct overlap mark is well exceeded (in some cases the  $1.5 \times \text{ATF}$  mark will be covered by the second section). The minimum acceptable overlap of the two sections is  $1.3 \times \text{AF}$ . Please contact your local Spunlite Territory Manager if this cannot be achieved. In some cases (shear base and hinged) poles it is important that the gear door lines up with a certain orientation so be aware of where the gear door needs to be located.



4. Place the next section of the pole again on timber packers just up from the first section. It is desirable but not critical that the seams from the second section are 90 degrees rotated from the first section.



5. Pull/slide the second section back over the top of the first section and push down the pole as much as achievable trying to keep the sections as straight as possible. Place another bearer under the top of the second section to keep the sections on the same level.
6. Check to ensure the two sections are straight, looking up the pole from the bottom along the top and side planes of the pole. This is important, to keep the pole straight during

assembly. By using bearers of the same size as you work your way up the pole. It will help keep the pole straight in the side plane.



7. Feed the Tirfor cable up the inside of the two sections and connect the cable to a sturdy cross bar that goes completely across the top of the 2<sup>nd</sup> section. This will make sure it will pull from the centre of the pole to keep the force on the sections evenly distributed.

8. Use the Tirfor winch to pull the two sections together making sure they pull together evenly. During winching it is good practice to agitate the joint by firmly tapping the joint with a rubber mallet or a timber bearer held against the surface with a hammer. This will facilitate the mating of the joint. Once tight, leaving pressure on the cable, use a wooden maul or a sledgehammer to strike a wooden block against the section at the location of the joint. Impact hard enough to jar the joint but not enough to damage the steel or galvanizing surface. This action will vibrate any tight spots in the overlap to help allow the section to pull together more for a tighter joint.
9. Check that the overlap of  $1.5 \times AF$  has been achieved. At this stage stop winching as this may cause bowing especially with slender columns. Release the pressure on the Tirfor winch and set to allow free spool of the cable. If adding another section pull enough cable through the winch to allow for another section to be added.
10. Follow steps 3-9 for the addition of more sections until the pole is assembled. With the addition of each section make sure there are sufficient timber bearers under the pole (at least one per section). This will prevent any sags and curves forming while the pole is being assembled and will facilitate a smoother assembly process.
11. The last step is to add the outreach. In some cases, it may not be possible for the loop at the end of the Tirfor cable to pass through the spigot at the end of the outreach. In this case it may be necessary to use a strop or sledgehammer to attach the outreach. These methods will be covered below.

## Sledgehammer Method

11. It is best to assemble the columns on a level piece of ground as close to the final installation location as possible. Check the ends of the sections for any damage or galvanising build ups that might hinder the friction joint.
12. Place the bottom section on timber packers with the base up against a solid object such as a wall or solid section of curbing (place a section of wood between the section and the solid object to protect both the pole section and the solid object) and place wedge blocks at either side of the section to stop it rolling during assembly.



Ground Planted



Flange Based



13. Mark out the  $1.5 \times \text{AF}$  distance on the male end of the section. It is also prudent to make another mark further down the section just in case the correct overlap mark is well exceeded (in some cases the  $1.5 \times \text{AF}$  mark will be covered by the second section). The minimum acceptable overlap of the two sections is  $1.3 \times \text{AF}$ . Please contact your local Spunlite Territory Manager if this cannot be achieved.

14. Place the next section of the pole again on timber packers just up from the first section. Where possible it is recommended that the seams from the second section are 90 degrees rotated from the first section.



15. Pull/slide the second section back over the top of the first section and push down the pole as much as possible trying to keep the sections as straight as possible. Place another bearer under the top of the second section to keep the sections on the same level.

16. Check to ensure the two sections are straight, looking up the pole from the bottom along the top and side planes of the pole. This is important, to keep the pole straight during assembly. By using bearers of the same size as you work your way up the pole. It will help keep the pole straight in the side plane.



17. Ensure the sections are in alignment looking down the pole (straight and level). Place a thick section of timber across the top of the upper section. Using a sledge hammer or large wooden maul strike the section of timber driving the upper section onto the lower section. Ideally target to be impacting the timber in the middle portion of the steel section to keep forces equal on all sides and reduce the risk of the section folding over at the top edge (the large piece of timber will likely start to break apart, so have plenty of spares available). Keep driving the upper section tighter on the lower section, until there is no movement occurring when the impacts occur (this can be checked by drawing small lines on the top of the exposed lower section and observing for movement during the impact process).



18. Care needs to be taken with this method, to make sure the top of the upper section is not damaged during the impacting process. Make sure the top edge does not get bent over, as this can cause problems of the next section to be added. Check that the minimum overlap of 1.3 x AF has been achieved (ideally targeting a 1.5 x AF).
19. Follow steps 3-8 for the addition of more sections until the pole is assembled. With the addition of each section make sure there are sufficient timber bearers under the pole (at least one per section). This will prevent any sags and curves forming while the pole is being assembled and will facilitate a smoother assembly process.
20. The last step is to add the outreach. In some cases, it may not be possible for the loop at the end of the Tirfor cable to pass through the spigot at the end of the outreach. In this case it may be necessary to use a strop or sledgehammer to attach the outreach. These methods will be covered below.

## **Outreach Arm Attachment Method**

### **Tirfor Method**

Feed the Tirfor cable through the spigot on the outreach and attach to a small crossbar. Place the outreach on the top section of the column and pull together making sure they are square as possible. Slowly increase the tension on the Tirfor. It is best that the outreach is held vertical (but the pole is still on the ground) at this point so the pull on the outreach is centred and also the cable is in the centre of the bottom section of the pole to make sure the force is acting downwards as much as possible. Use the same methods as per pole sections to facilitate the mating of the outreach with the top section. Make sure the required overlap is sufficient. The pole is now ready for installation.

If the Winch method was not suitable to connect the outreach, it may be necessary to use a sledgehammer to connect the outreach.



In this case the outreach is supported and the pole is driven into the outreach. The outreach and pole should be supported on timber bearers to facilitate smooth mating of the overlap. Slide the outreach onto the top of the pole and place (wedge) the outreach against two supports, one at the end near the spigot and one near the centre of the outreach. Supports can be a tree, wall, truck tyres, kerb or anything that will brace the outreach without damaging it (use a spacer block of wood to protect the arm from damage). Gently hammer the bottom of the pole using a timber packer pushing the outreach against the supports to prevent any movement. Increase the force until the desired overlap is achieved. Agitate the joint with a rubber mallet.



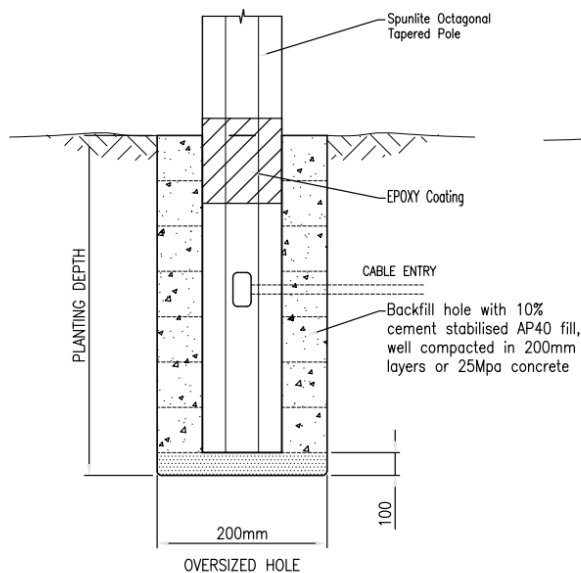
## Erection Procedure

### Flange Base Poles

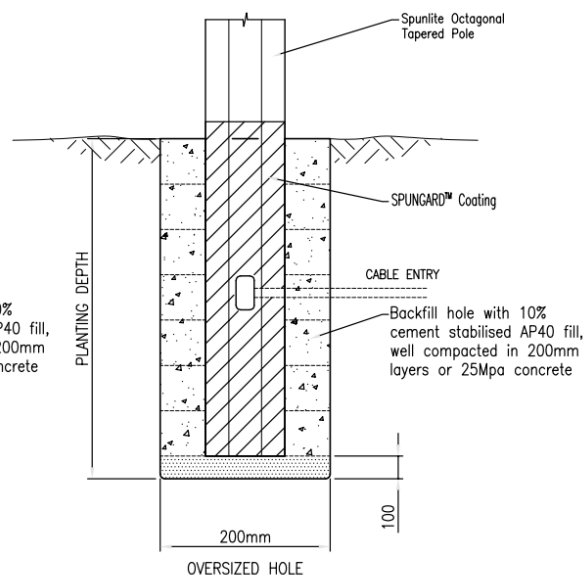
- Check pole balance position and commence lifting slowly.
- Keep the hoisting rope vertical by slewing the jib continuously or frequently.
- Once the pole is almost standing upright, hoist it clear of the ground, and then lower it slowly into position over the foundation.
- Manually make last positional adjustments so that the holding down bolts are aligned with the correct holes.
- Taking care not to damage the threads, slowly ease the pole down until at least 2 nuts can be adequately engaged, at least the thickness of the nut.
- Before lowering any further - slew the jib a little to bring the pole vertical above the holding down bolts.
- Now lower onto all holding down bolts and adjust levelling nuts to ensure the pole stands vertically.
- Fit the top set of nuts. Unless specified otherwise, all nuts are to be tightened to “Snug Tight”. Snug Tight is described in clause 4.2.6.2 NZS3404.1 (2009) as the tightness that can be achieved by the full effort of a person using a standard length podger spanner.
- After tightening to “Snug Tight”, the top nuts are to be loosened, and then retightened back to “Snug Tight” to ensure that the Galvanized layers on the fasteners are compressed.
- Unless specified otherwise by the foundation designer, grout under the base using a Non-Shrink Grout (i.e. SIKA GROUT 212 or equivalent).

## Ground Planted Poles

- The depth of the ground planted section is nominally equal to 1/6th of the total height of the pole or 1/5th of the nominal Luminaire mounting height above ground level.
- Spunlite recommends the following:
  - The surrounding soil to have a minimum Ultimate soil bearing pressure of 100kPa and Ultimate shear capacity of 40kPa.
  - The minimum diameter of the hole is calculated as base AF + 200mm.
  - Backfill hole with either 10% cement-stabilised AP40 fill, well compacted in 200mm layers or 25MPa concrete.
  - Slope the top of the backfill around the pole to encourage rain to run off away from the Pole.
  - Avoid using in situ soil, removed when auguring the hole, as backfill as this can cause pole structural stability and/or corrosion issues.
  - Allow sufficient time for the concrete to set before loading the pole.



TYPICAL GROUND PLANTED FOUNDATION



TYPICAL SPUNGARD GROUND PLANTED FOUNDATION

## Notes:

Requirements for the Ground Planting of most Spunlite poles will be covered by the above recommendations, however this information is provided as a guide only. The end user is responsible for determining the specifics of their ground planting detail. It is recommended that a site evaluation by a qualified civil/geotechnical engineer takes place to determine the specifics for each project.