

AL220 ALUMINIUM GROUND TOWER INSTALLATION MANUAL

DO NOT install this equipment unless you have been instructed in its safe use and operation and have been given permission.



Never install equipment during storm activity. There is no safe location outdoors during a storm event. If you can hear thunder you are in danger of being struck by lightning.

Look up and live. You may be killed if the equipment comes in contact with powerlines. Always think ahead and plan your task in advance.

PERSONAL PROTECTIVE EQUIPMENT



Gloves recommended.



Sturdy, enclosed footwear must be worn at all times.








Personal Fall Arrest System (PFAS) needed for at-heights installation. Qualified personnel only.






Hard hat recommended.

GENERAL SAFETY & REGULATORY REQUIREMENTS

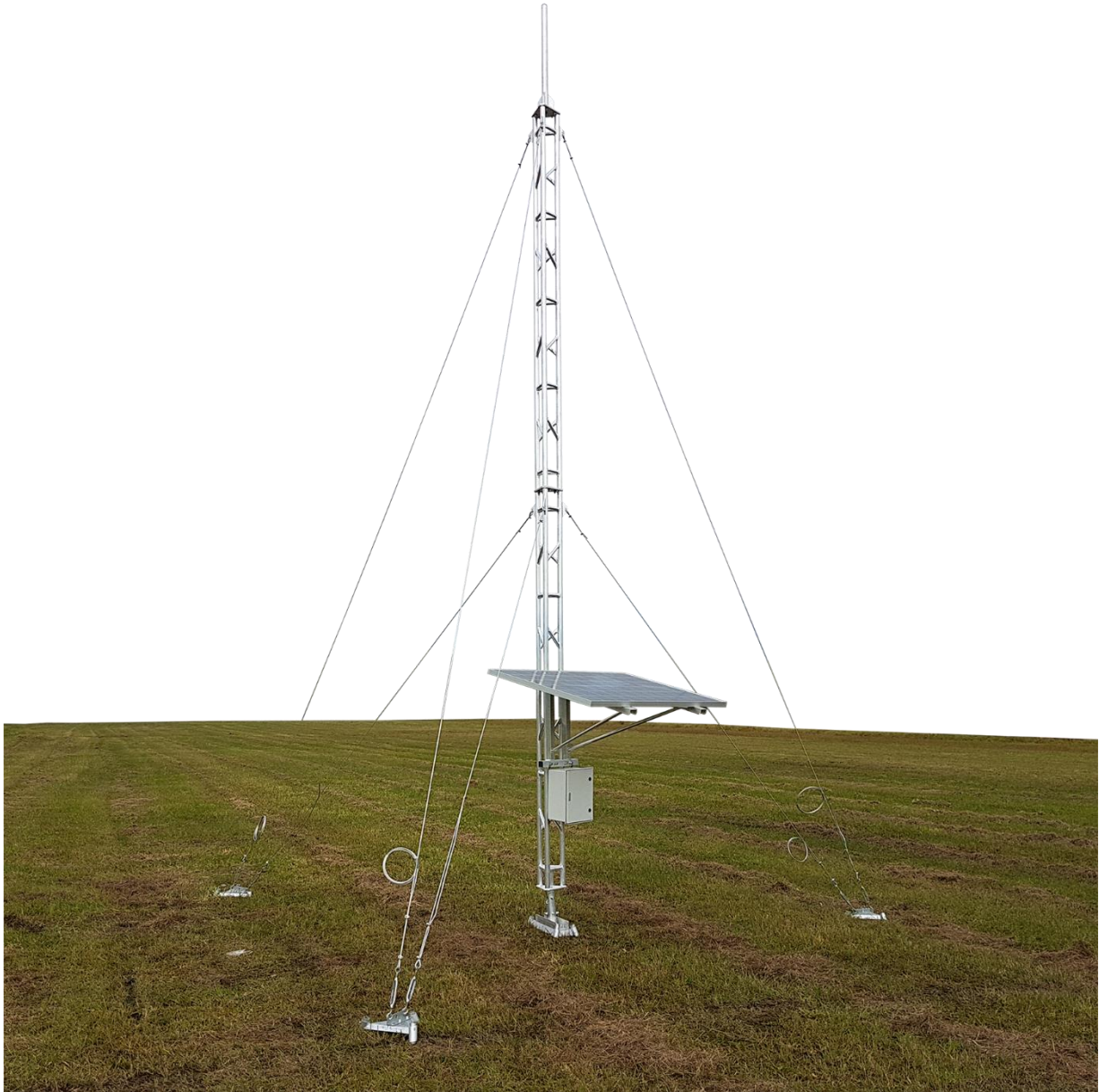
DO

-  Check workspaces and surrounding area to make sure no slip/trip hazards are present.
-  Check installation area for obstructions and electrical cables.
-  A soil report is mandatory, only use a footing that matches the location soil report.
-  Follow Dial Before You Dig (1100) processes.
-  Make sure installation is done by qualified personnel only. Check state and local regulations for safety and building code requirements. The installation might need council development approval.

DON'T

-  Don't install near powerlines.
-  Don't install during a storm event.
-  Don't install on your own. A minimum team of two is needed for most tower sizes. Larger teams are needed for larger towers.

COMPLETED INSTALLATION



INSTALLATION PROCEDURE

These are the steps for installing the AL220 series aluminium lattice tower onto an ordinary flat ground surface. The tower size used in this installation example is a 6.2 metre two section model.

This procedure does not cover installation of Surefoot Footings. Please follow installation guide supplied with your footing.

Step 1.

Unload and check supplied materials. Package should include:

- 1x AL220 3.1 metre aluminium lattice module
- 1x AL220 3.1 metre aluminium Surefoot-interfacing base module
- 1x AL220 spigot or headframe (spigot pictured)
- 1x AL220 multi-axis base with M12 bolt + nylock
- 3x Surefoot-interfacing guy wire anchor plates
- 1x spool of 6 mm 7x19 strand guy wire (galvanised or stainless steel)
- 9x turnbuckles (galvanised or stainless)
- 36x wire rope clamps / saddles
- 18x 7/16" bolts and nylocks
- 18x guy wire thimbles
- 4x M16 bolts + nylocks (for base plate)
- 9x M12 bolts + nylocks (for anchor plates)

You will also need:

- 2x 16 mm / 7/16" spanners (or shifters)
- 2x 18 mm spanners (or shifters) for M12 (multi-axis base)
- Spirit level
- Measuring tape
- 11 mm socket for wire rope clamps / saddles
- Socket set
- 6 mm drill bit
- Driver / drill
- Weatherproofing silicone
- Additional roof screws as necessary

Surefoot Footing – quantity and types will depend on soil report:

- 1x Centre Surefoot footing
- 3x Anchor Surefoot footing
- Pile lengths (13 used in this example)

Step 2.

Before installation, fit base plate to Surefoot Footing using the four supplied M16 bolts and nylock nuts. Alternate tightening to make sure all four nuts are as tight as possible.



Step 3.

Fit the three supplied anchor plates to your Surefoot Footing using the nine supplied M12 bolts and nylock nuts. Alternate tightening to make sure all three nuts are as tight as possible.



Step 4.

Identify installation position for tower multi-axis base.

Ideally you'll raise the tower in the direction of ground slope. This makes lifting easier and installation safer.

Use industry standard calculation tools to determine radii and associated guy wire lengths.

A 6.2 metre tower on flat ground needs a 3800 mm radius to maintain optimal 60° guying.



Step 5.

Follow instructions provided with the Surefoot Footings. The 6.2 metre tower in this example uses three guy wire anchor footings.

An *example* of the instructions is provided below – the footing supplied to match your soil report will have different requirements.

Identify services

- 1** Mark and identify the location of any underground obstacles or services before driving the piles.

Pre - install hardware

- 2** Install all nuts and bolts and secure to Surefoot plate.

Set out

- 3** Set out and place the Surefoot plates in their correct position.

Bedding down

- 4** Protect the top surface of the surefoot with a timber block. Tap with a sledge hammer to bed down and level into the soil.

Load and semi - drive piles

- 5** Slide apposing piles through the guide tubes in the Surefoot.

Level and secure the plate

- 6** Using a small sledge hammer drive the piles 200-300mm to secure the plate. Do the same with the rest of the piles in the Surefoot.

Drive the piles

- 7** Then drive each pile alternately in increments with the jackhammer, periodically checking for level. Drive to designed pile embedment depth or refusal, see notes Pg. 06.

Complete driving piles

- 8** Finish driving piles with the jackhammer until piles are flush with Surefoot plate.

Lock the plate in place

- 9** Using the jackhammer through the center hole in the Surefoot, drive down the plate until the piles are tightly locked in.

Finishing the plate

- 10** If refusal conditions are met and the Engineer has approved the cut piles, note in the bore log and paint exposed metal with cold gal Zinc rich touch up paint.

Install Tek screws

- 11** Install the self drilling Tek screws through the Surefoot guides, securing the pile to the Surefoot plate.

Pile record

- 12** A pile record must be kept for each footing and returned to the Engineer once completed, refer to page 8 and 9.

Step 6.

Attach AL220 3.1 metre lattice base module to multi-axis base using M12 bolt.

Thread nut until firm but don't fully tighten yet.

If installing 9.3 metre and larger towers, don't attach additional tower modules at this stage.



Step 7.

To safely raise fully assembled towers it's important to complete the guying for the first 3 metre section so that when you raise the tower, the first 3 metre section can be anchored off and the tower will remain upright.

Prepare guy wire attachment by attaching thimbles to tower.

Widen the thimbles by hand and close once attached. Loop the guy wire through the thimble and use 2 saddles to clamp the guy wire.



Step 8.

Push the first guy wire saddle as close as possible to the thimble.
Observe the “never saddle a dead horse” rule, that is, nuts must face the direction of the main cable and not the severed tail.

Use an 11 mm socket to tighten saddle nuts.
Alternate tightening to make sure both nuts are as tight as possible.



Step 9.

In this example we're using 3 guy anchor plates, attaching both the 3 metre and 6 metre guy wires to our plates. To maintain a 60° pitch for our 6 metre guy wires the inner 3 anchor plates are placed at a distance of 3.6 metres from our base plate.

Because we are installing a six metre tower, we can lift this tower into place in one step. Larger towers should raise the first module, fit off guy wires, and lower back down. This extra step allows larger towers to be lifted into place and remain safely upright while the remaining guy wires are fitted.



Step 10.

Attach each AL220 module section using 6x 7/16" bolts and nylock nuts and 2 shifters. Alternate tightening to make sure bolts are tightened equally and sections are aligned properly.

Repeat this process to attach the spigot or headframe.



Step 11.

Attach guy wires to their anchor plates using turnbuckle assemblies. *(Photos from Roof Tower procedure shown)*

Unthread each turnbuckle to about 80% of maximum.

Repeat steps 7 and 8 to loop guy wire through the turnbuckle eye, using a thimble and 2 wire saddles and tightening with an 11 mm socket.



Step 12.

Lift the tower.

IMPORTANT!

Lifting is the most safety critical step. **DO NOT** attempt it if you are not appropriately qualified. While the tower is lightweight aluminium the lift becomes increasingly difficult as you move towards the centre. We recommend you have a third team member to help the lift by pulling from the front. Larger towers require a gin pole and winch assembly. Very large towers may require a Franna/crane to complete the lift. Use your professional judgement and always be safety conscious.

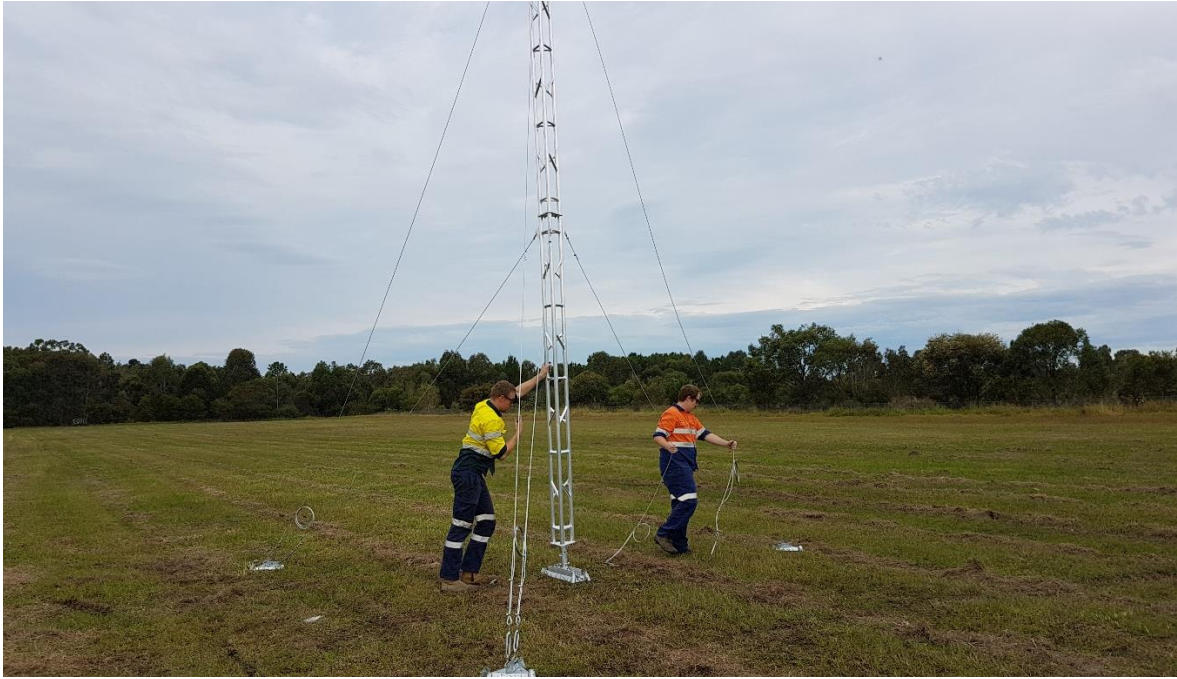


Step 13.

When positioned upright the rear guy wires will now be taut. One team member should now attach the front guy wire to its anchor plate.

Tighten the M12 hinge bolt (vertical axis) on the multi-axis base using an 18 mm spanner / shifter.

The tower should now remain upright under stable weather conditions. Use your professional judgement and always be safety conscious.



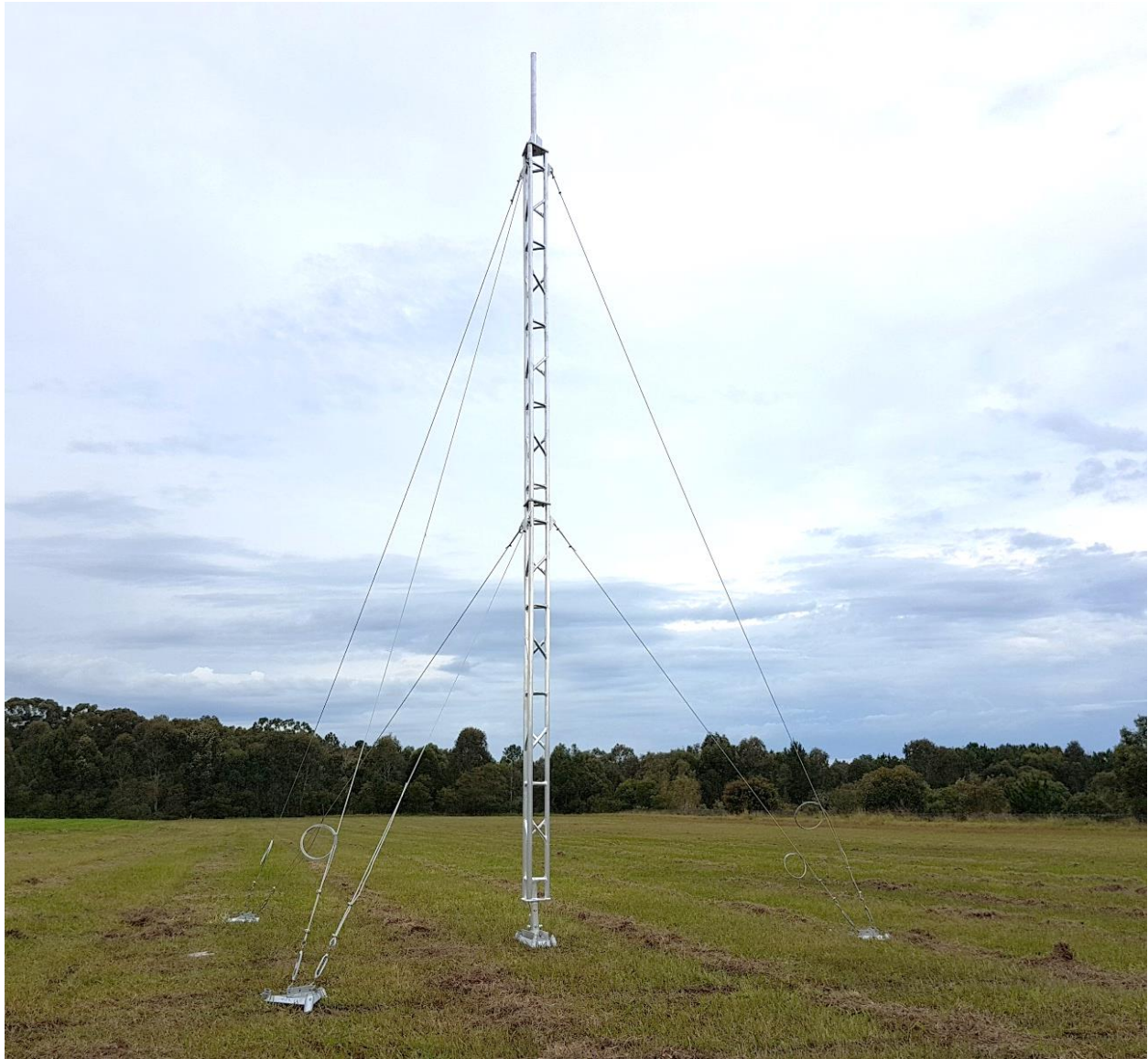
Step 14. – FINAL STEP

The tower is now fully installed.

Adjust turnbuckles, using a spirit level to make sure tower remains straight.

Larger towers may need measurement using a guy wire tensioner to make sure they meet engineering specifications for the wind region.

Tidy excess guy wire cabling and clean installation environment as per your environmental policy.



End of document