# Installation Manual for Solpod Utility

*Solpod Utility*

SOLPOD

Solpod Pty Ltd, ABN 47 623 269 947

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# Introduction

Thank you for choosing the Solpod Utility ground mounted solar frame from Solpod Pty Ltd. Made from custom-designed steel beams and components, Solpod's streamlined design and improved frame strength greatly simplifies solar panel installation. Solpod is backed by a 15-year warranty and is compliant with the AS/NZS 1170.2:2021 on wind actions.

### Overview

Solpod solar PV arrays are built using pre-assembled frames (or Solpods) of solar PV modules. Each Solpod is lifted into location using a crane. The spine is fixed to the ground frame, then the wings of the Solpod unfold into place.

*Solpod Ground (prototype) being unfolded onto a ground frame*

### Compliance and certification

Solpod Utility is supplied with certification that suits most sites, covering wind regions A & B, terrain category 2. Certification is provided by Tensys Engineers, www.tensys.com/. Custom certification is also available for sites that aren't covered by the generic certification, e.g. for terrain category 1.5 or 1.0 (near open water). Contact Solpod for more information.

# Site preparation

Prior to installation, the site needs to be inspected and prepared, including a weather assessment, site access plan, cranage plan, material handling plan and traffic plan.

### Weather assessment

Solpod installation is sensitive to wind, rain and debris, particularly high winds which can affect the crane. Installation should occur when the weather is forecast to be still and dry.

### Access plan and cranage plan

Each site requires access for people and materials, independent of the crane. A typical 10 MWp solar array consists of 2,000 Solpods covering an area of 7.5 hectares.

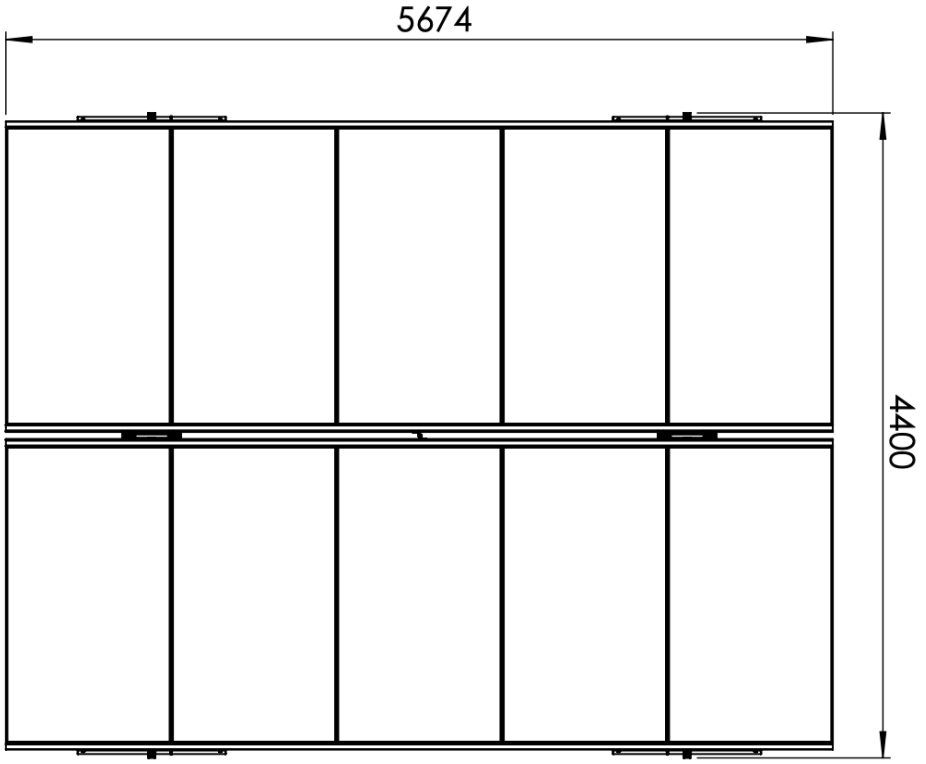
### Traffic plan and material handling plan

Depending upon the access plan, cranage plan and material handling plan; an overall traffic plan may be required. Traffic plans are usually generated by a traffic management subcontractor. Depending upon the number of crane locations required, material handling may need to be considered.

- Where will the Solpod delivery be located?
- Where will ancillary components (inverters, cabling, trunking) be located?
- Where will waste be stored prior to removal?

**Area layout**

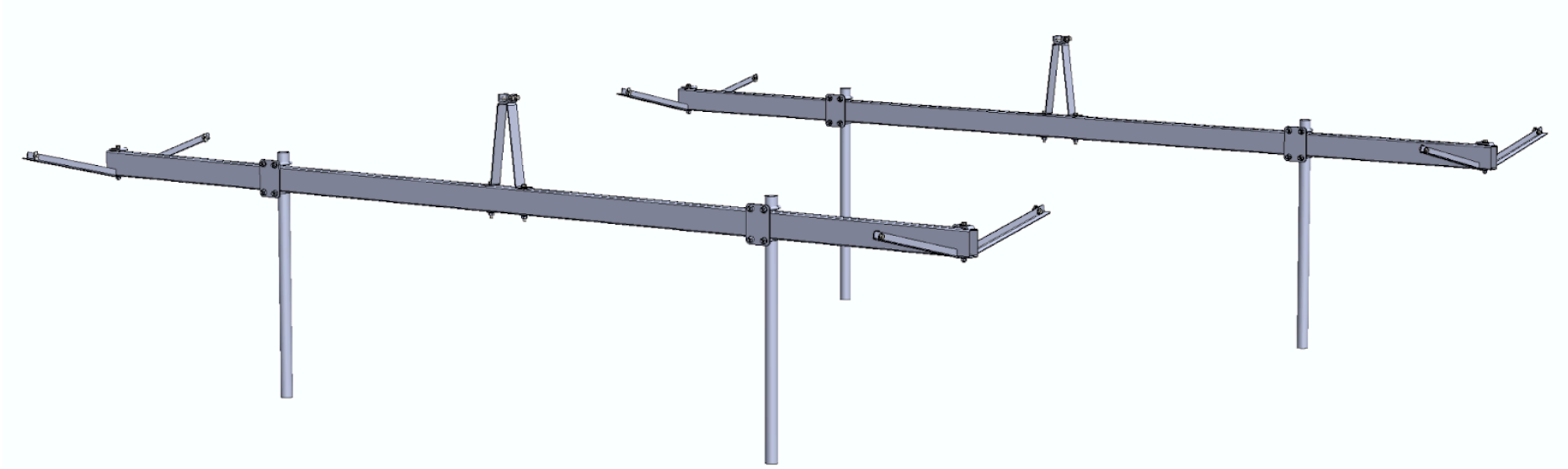
Each array consists of multiple Solpods, and space needs to be allocated for access walkways, inverters and cable trays. Each Solpod comprises two wings, each of five modules. Typically, Solpods are laid out sets of 5, to enable DC strings of 25 modules, to suit the DC input range of 1500 volt inverters. Lengthways, Solpods can be installed with a 20-60 mm gap between them to minimise the need for extra hardware for DC cable protection. Sideways, Solpods should be installed with a 600 mm gap to allow access to the fixings along the edge beams.




*Solpod Utility is 5674 mm long and 4400 mm wide (using 2063 x 1134 mm modules)*

# Ground frame

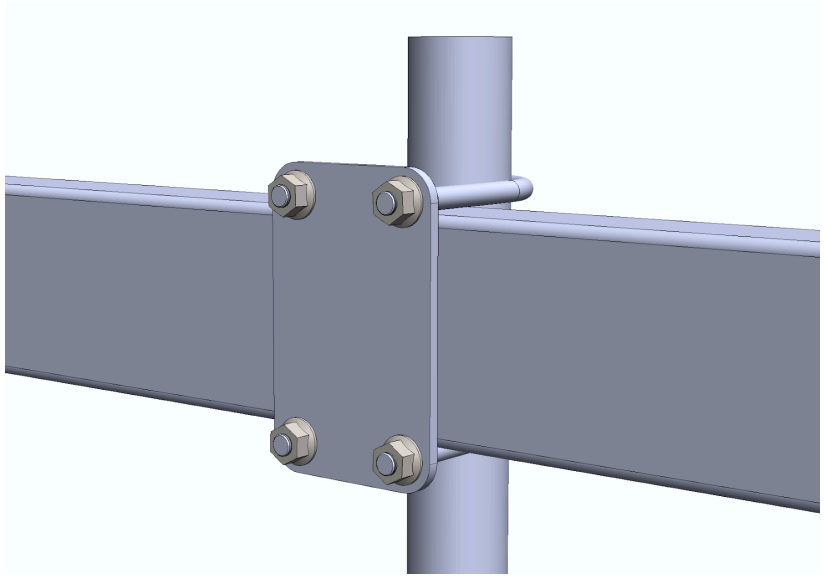
Each Solpod is supported on a ground frame, which is held down using four anchors. The anchors can either be non-penetrating, such as ballast blocks, or penetrating, such as rammed posts (shown below). The ground frame is designed to be adjustable to cope with uneven ground, e.g. the anchors can be moved to the other side of the cross-beam, or moved up to 200 mm away from their default location, and the whole frame can be adjusted vertically on the risers. The two cross-beams do not have to be perfectly parallel.



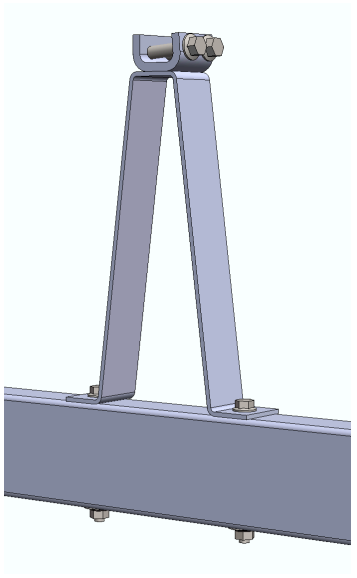
*Ground frame for Solpod Utility, showing four rammed posts, two cross-beams, and two spine support brackets*

The four anchors (or ballast blocks) are spaced at 2500 x 3650 mm. Solpods can be spaced out at 5700 mm apart lengthways (comprising 5674 mm for the Solpod and 26 mm for a gap) and 5000 mm apart sideways (comprising 4400 mm for the Solpod and 600 mm for a walkway).

The maximum distance between the top of the concrete and the underside of the cross-beam is 600 mm, and the maximum projection of the riser is 100 mm above the top of the cross-beam. Use a laser level to ensure the whole array is level. After the bearers and in position, tighten the U-bolts.



*Cross-beam fixed to anchor using U-bolts*



*Spine support bracket fixed to cross-beam*

# Geotech risk

Solpod Utility has lower geotechnical risk than a single-axis-tracker, because:

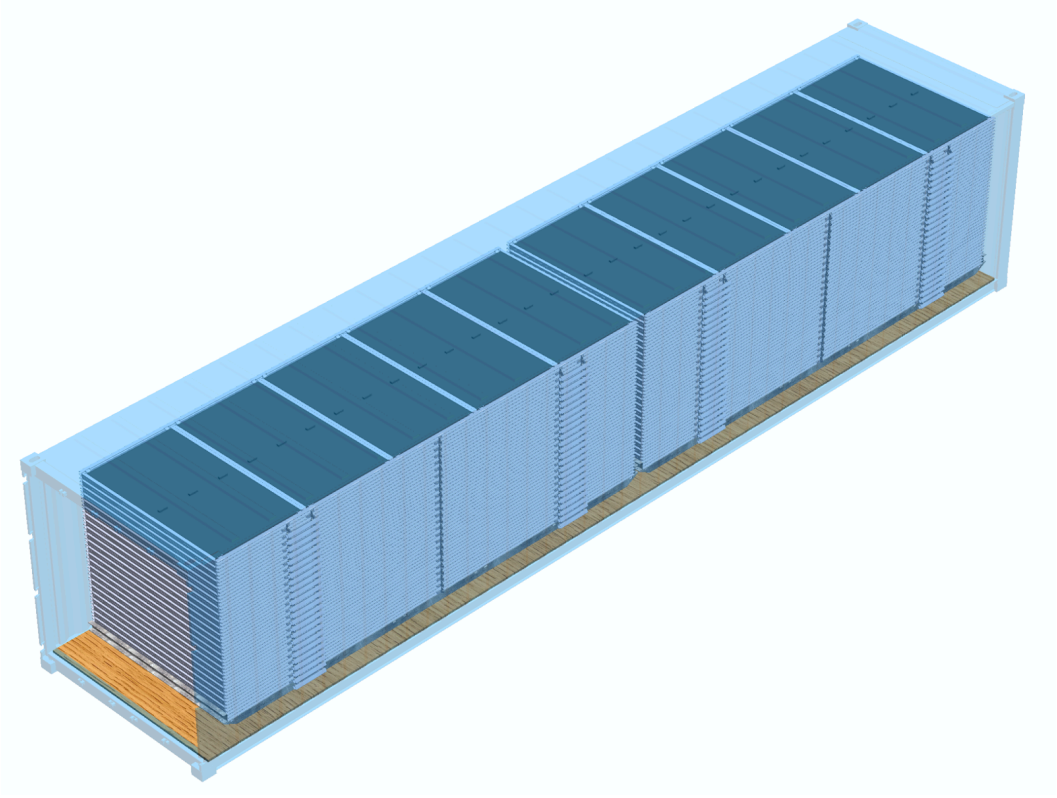
- The Solpod rammed post (48 mm diameter) is much smaller than e.g. an I-beam 200 mm wide
- The Solpod post ramming depth (1 metre) is much less than for other racking systems e.g. 3 metres
- If a Solpod post hits rock it can be removed and reinserted up to 200 mm away, or removed and replaced with a ballast block

*A Solpod rammed post can be removed and reinstalled up to 200 mm away*

# Lifting Solpods into location

### Removing Solpods from the container

Solpods are delivered to site on a skid in a container. Two skids can fit in a 40’ container. Skids are dragged out of the container using suitable equipment.



*Two stacks of Solpods, on skids, in a 40’ container*

### Lifting Solpods onto each ground frame

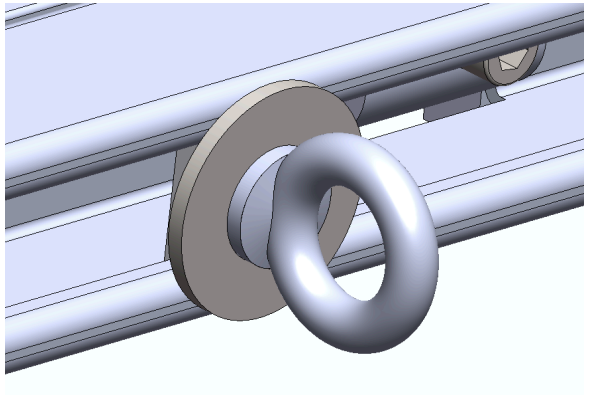
Solpods are lifted from their stack to their final location in the array using a crane and four chains (two chain sets), each rated to 1 tonne.

Each chain should be set to an equal length of between 3 and 4 metres, and have a small self locking clevis on the end.

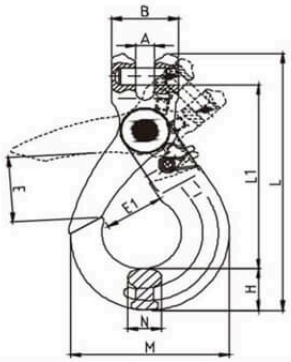
During craning, do not stand under the load (the Solpod); instead stand to the side, and guide the Solpod using guide-lines. This allows the Solpod to be rotated and translated into the desired position.

### Connecting chains to each Solpod

Each Solpod is supplied pre-assembled with four lifting points, two on each edge beam. Each lifting point is an eyelet bolt (with an internal diameter of 19 mm) fixed to the edge beam. The crane chains can be fixed to the eyelets using a small self locking clevis (e.g. with a depth of 15 mm), or a D-shackle.



*Eyelet bolt as lifting point*



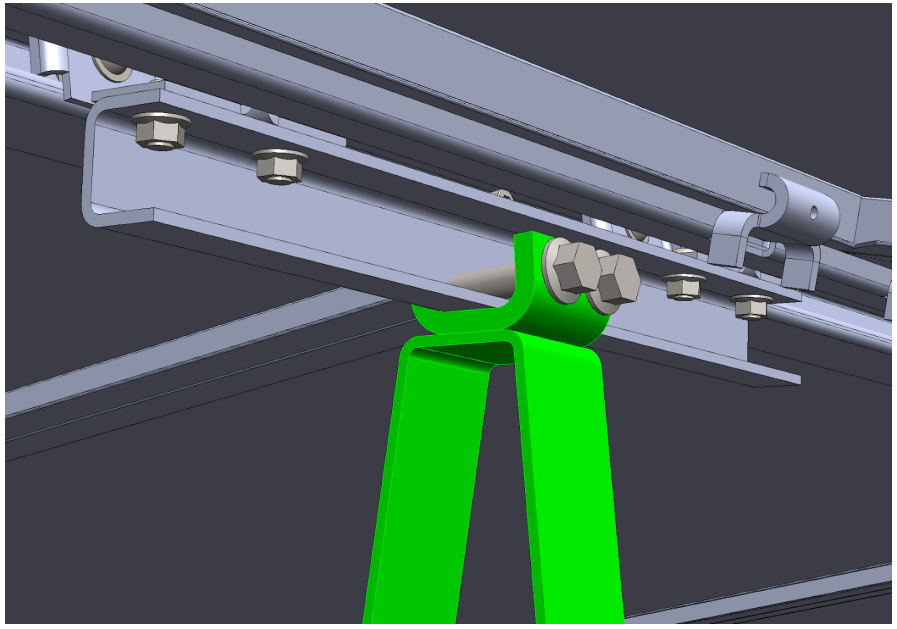

| Model | W.L.L. | B.L | A (mm) | B (mm) | E (mm) | E1 (mm) | L1 (mm) | L (mm) | H (mm) | N (mm) | M (mm) | Weight (kg/pc) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8-TP808-06 | 1.12T | 4.48T | 8±0.5 | 32±1 | 32±2 | 28±1 | 99±3 | 134±3 | 20±1 | 15±0.5 | 73±2 | 0.44 |

*A small clevis can connect directly to the eyelet bolts*

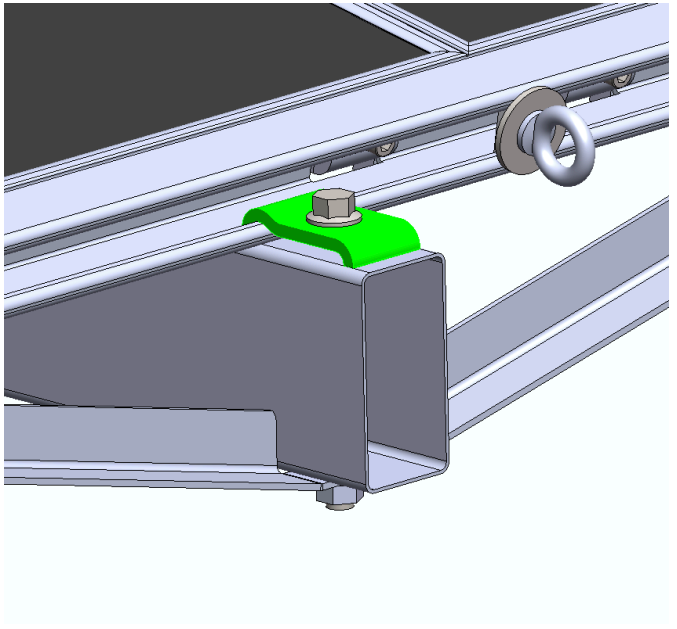
### Unfolding

The crane lowers the Solpod down onto the spine support brackets, which are already fixed down onto the cross-beams. Tighten the dual horizontal bolts (that are located at the top of each spine support bracket). Lower the Solpod further, allowing the two wings to unfold, until the edge beams rest on the cross-beams. Detach the chains so the crane can begin the next cycle, then position and fix the edge beam clamps and stiffening brackets.

*Solpod Utility (prototype) being unfolded*



*Spine beam fixed into spine support bracket*



*Edge beam fixed to cross-beam using edge beam clamp*

# Fastener torques

Tighten fasteners to the minimum torque specified below:

- U-bolts (fixing cross-beam to anchor post): 20 N.m
- Through-bolts (fixing spine support bracket to cross-beam): 20 N.m
- Horizontal bolts (fixing spine into top of support bracket): 20 N.m
- Vertical bolts (fixing edge beam clamp to cross-beam): 20 N.m

## Ballast weight

Each Solpod Utility in wind region A, terrain category 2, requires a total ballast of approximately 600 kg, or 150 kg for each of the four blocks. Site specific certifications are recommended, and available from Tensys Engineers.

# Rammed posts

Solpod Utility can also be installed on rammed posts, instead of ballast blocks. Each post (or pile) is 2 metres long, rammed to a depth of 1 metre. Posts are 40NB (48 mm OD) 3.2 mm wall thickness.

# Cable trays

Cable trays can be fixed to the cross-beams.

Cable looms can be suspended from the cross-beams.

# Electrical earthing

Each solar panel within the Solpod frame is earthed to the adjacent Solpod edge beam via the module brackets. An entire Solpod frame can be earthed using a single earthing attachment, e.g. to one edge beam or one cross-beam.

# Maintenance

The coated steel used in Solpod is largely maintenance free. Only in highly polluted or marine conditions is rinsing with clean water required, during scheduled panel cleaning.