

Ventilated Roof System for Marley Solar Roof Tiles Installation

Heat build-up in cables of PV units may result in power losses.

For this reason, the adaptation of a single batten standard installation practice, to a ventilated eaves and ridge, double batten system, is required to achieve adequate ventilation below roof, to ensure that the cables remain as cool as possible.

Please note! Where adaptations are not indicated or changed, Marley Roofings' Minimum Fixing Specifications and Good Roof Tiling Practice still applies and should therefore be used in conjunction with one another to ensure that SANS regulations pertaining to roofing construction is still adhered to. We are specifically referring to SANS 10400-1990 (old: SABS 0400-1990) Part L (Roofing), T(Fire Regularities) and XA(Energy Efficiency). Because specifications within SANS are vast and may fall outside SANS10400, it is important that architects familiarise themselves with the SANS regulations pertaining to a project to ensure that all construction and building work results in buildings and homes that are safe. It is important that the National Building Regulations and Buildings Stands Act 103 of 1977 and SANS be read together.

Installation must be carried out by a competent roofing installer with good experience of installing Marley Modern. It is the end-consumer's responsibility to research and request references. The installer must be briefed by Marley and Solar certified installer, to ensure all is clear and cover any concerns or misunderstandings.

Safety regulations working with photo voltaics!

A photovoltaic system produces high electrical voltages and currents, which if handled improperly can lead to life-threatening electric shocks or fires.

In order not to endanger the safety of persons and warranty claims, please ensure compliance with the safety notes and instructions in this document!

Electrical connection

- *The planning of the electrical installation and commissioning of the solar roof tiles may only be carried out by Suitably Qualified and Experienced Persons, persons who due to their electrical experience and professional qualifications are qualified to complete the installation and commissioning of the PV system safely.*
- *The solar power modules are electrical voltage sources with the associated potential dangers. Even with low irradiation, the full open circuit voltage will create a risk to personal safety and as such needs to be mitigated against.*
- *Improper execution during installation or commissioning can cause damage and endanger people.*
- *Check the modules for damage when unpacking. Damaged modules must not be installed or put into operation. Any damage must be reported to the supplier without delay.*
- *The junction box (on the back of each tile) must not be opened. The tiles product warranty is no longer valid if its junction box is found to have been opened.*
- *The connection cables must not be disconnected from the junction box.*
- *The installation of the PV system must be undertaken in such a way that the cables connecting the tiles are free of tension.*
- *It is important to ensure that the MC4 plugs remain undamaged during the unpacking and subsequent installation of the tiles.*
- *When connecting one tile cable to the next, it is important that the male and female connectors are fully coupled together.*
- *The tiles may not be modified in any way. This applies in particular to the cables and plugs located on the back of the tile. Where connections are made to the inverter, only approved suitable MC4 connectors of the same type as supplied with the tiles are permitted.*

The supplied connectors should not be replaced or supplemented by low quality connectors from a different manufacturer, as this can cause voltage creepage and temperature rises due to increased transition resistances. We therefore stipulate that only high-quality connectors from the same OEM manufacturer are to be used where replacement connectors are required to be installed.

- *The connectors are only 100% watertight when fully inserted. If not fully inserted even in the case of minimal moisture, rain or other moisture, the contacts within the connectors corrode and become inoperable. Should this situation become apparent for an existing installation, the affected tiles should be replaced immediately.*

- *The space between the back of the module and the roof sub-construction must be unrestricted in order to allow air circulation to the back of the tile. Under no circumstances should the underside of the tile be used for any roof insulation.*
- *It is important to ensure that the back of the tiles are protected at all times from damage. A tile with a damaged back sheet can no longer be installed and must be replaced.*
- *It is also equally important to ensure that the back of the tiles do not encroach upon by any foreign objects that can cause damage during the installation of the tiles.*
- *All national and local safety regulation's and instructions relating to electrical equipment systems and PV systems are to be complied with at all times.*
- *Once the tiles are installed and connected in series, voltages above the protection low voltage can be 120 VDC.*
- *Never pull plug connections whilst the system is active.*
- *Observe the conditions of use, the additional installation instructions and the maximum permissible load on the Solar power modules.*
- *Cables to be relieved of strain, mechanically stress-free and with sufficient bending radii.*
- *Where appropriate cables should be supported by cable-ties.*
- *Be sure to pay attention to the polarity of the solar power modules. A reverse polarity leads to the destruction of the protection diode. This can result in damage to the module and invalidates the product warranty.*
- *Only solar tiles of the same type and performance class can be connected into the system.*

Storage and Handling of Marley SolteQ Solar Tiles:

- *The solar power modules must be stored, installed, commissioned and operated in accordance with the manufacturer's instructions.*
- *The tiles are a glass product, so please treat them with care. Don't let anything fall on them.!*

The modules are not suitable for walking on, therefore appropriate precautions to spread the loads associated with persons wishing to access the roof need to be put in place.

- *Protect the tiles by covering the front and back to guard against scratches and damage.*
- *The focusing of sunlight on the module surface with mirrors or lenses is not recommended.*
- *The maximum permissible system voltage of the solar power modules must not be exceeded, even at low ambient temperature (see data sheet and label on the back of the tile).*

- *The earthing or the respective equipotential bonding of the modules must be carried out in accordance with the country-specific regulations.*
- *If the solar power modules are integrated in a lightning protection system, they must comply with the relevant regulations and be complied with.*

Storage

- *Do not store the solar power modules unsecured.*
- *Store the solar power modules in a dry place.*
- *The solar power modules must not be stored where they are exposed to water (e.g. rain).*

Unpacking the Solar Modules

- *Remove the solar power modules individually from the pallet/packaging.*
- *Check the solar power modules for damage after unpacking.*

Do not install damaged solar power modules. Any claim for damaged modules and components must be made immediately before use or assembly, otherwise the warranty will be invalidated.

Roof safety:

- Danger of death during roof work. The installation of the solar roof tiles may only be carried out by Suitably Qualified Experienced Persons, persons who due to their experience and qualifications are qualified to complete the installation of the PV roof tiles safely.
- All relevant national and local health and safety rules and regulations are to be complied with without exception.
- Use the appropriate fall protection devices.
- Make the nearby public aware of the risks associated with the roof works and mitigate those risks accordingly.
- Warn people who are in close proximity to the roof works of the potential risk of falling objects etc.
- Keep children away from the danger zone.
- Do not allow unauthorised persons on the roof.

- The cables must always be protected against cross-section reduction. For this purpose, the trapping / crushing of the cables, connectors or the junction box is not permitted, especially between the module and the substructure /substructure or roof battens.
- The tiles are to be installed free from all mechanical stresses and in accordance with manufacturer's instructions.
- Particular care should be taken to avoid any weight loading on the tiles, during or post installation.

Important! Regardless of who actually installs the SolteQ PV roof tiles, the water-tightness of the roof is the responsibility of the roofing contractor.

It is generally recommended to have a water-resistant, radiant barrier (excluding Marley Industrial Radiant Barrier or paper based radiant barriers) fitted to the sub-roof below the tiles and battens. The Marley SolteQ energy roof is 100% rain safe when correctly installed. However, rain water driven by strong winds can get underneath the tiles as is the case with conventional roof tiles without sealing compounds. The decision regarding the best method to be employed to ensure the water-tightness of the roof ultimately rests with the roofer/roofing contractor.

The combination of the individual tiles linked together form the basis for generating the DC electricity which is converted to AC electricity by an inverter, the latter enables the electricity to be utilised for domestic household use. The solar power modules can be used with all common inverters according to the country's usual electrical connection conditions as well as the regulations of the inverter manufacturers.

For inter-connection, the modules have 2 solar cables (a plus and a minus), with plugs that are protected against reverse polarity.

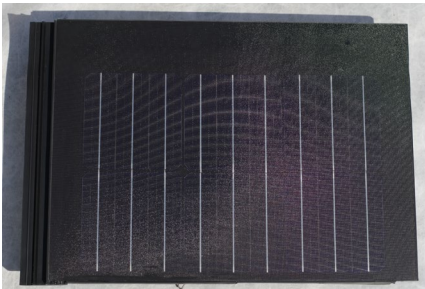
The electrical design must be carried out by a qualified electrician in accordance with this manufacturer's manual and all relevant national and local requirements.

ROOF CONSTRUCTION:

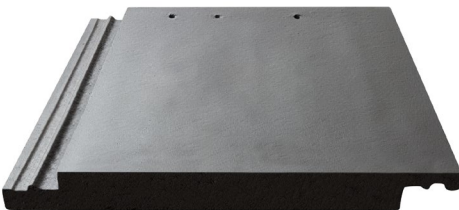
Summary of minimum Marley SolteQ Roof Materials and Accessories required to complete Marley Solar Roof Installation – this excludes structure timber and below-roof solar components!

For application and use of materials and accessories, please refer to Minimum Installation Guideline below this section.

1. Marley SolteQ Solar Tiles
ATIMASOSL MARLEY SOLTEQ SOLAR PV TILE



2. Marley Modern M22 Midnight Black Interlocking Flat Concrete Roof Tile
CTIMDM2BL MODERN M22 MIDNIGHT BLACK



3. Marley Hip Starter M22 Midnight Black (if hipped roof)
BICFITHM2BL TAPER H/S M22 MIDNIGHT BLACK



4. Marley Taper Ridge M22 Midnight Black
CFITRM2BL TAPER RIDGE M22 MIDNIGHT BLACK



5. Marley Modern Galvanised Nails
ANAGM50CR NAILS GALV. MODERN 50MM



6. Marley Dry Ridge Kit in Slate (please note that the Dry Ridge Components can be ordered seperately)
ADYKISTSL MARLEY DRY RIDGE KIT SLATE INL

Kit Content

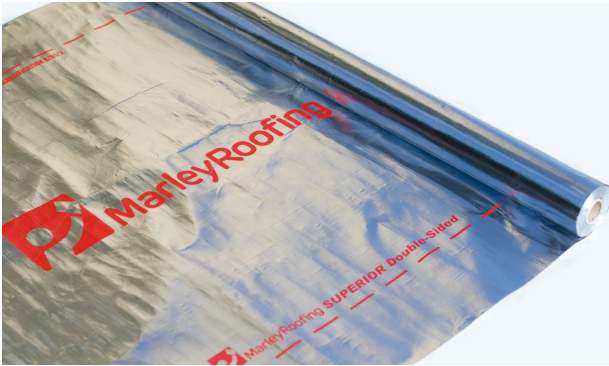
- > 13 x Ridge Trees
- > 27 x Ridge Clips
- > 1 x Compact Ridge Roll



7. Marley Double Sided Superior Radiant Barrier (preferred underlay for coastal - strong wind conditions)

ARB50UDGY

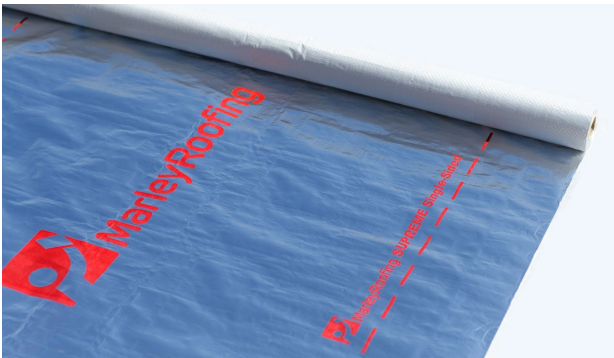
MARLEY RADIANT BARRIER SUP DBL SIDED 50M



8. Marley Single Sided Supreme Radiant Barrier (preferred underlay for inland regions - moderate wind conditions)

ARB45SSGY

MARLEY RADIANT BARRIER SPR SGL SIDED 45M



9. Marley Eaves Grid

AEG501ABL

MARLEY EAVES GRATE 100MM X 5000MM BLACK



10. Marley Eco-Tuff Barge Board (optional for gable ends – available in various lengths, also available in Fibre Cement)

AEB802030

MARLEY ECO-TUFF BARGE 3000mmX80mmX200mm



11. Marley Eco-Tuff Fascia Board (optional – available in various lengths, also available in Fibre Cement)

AFAET0830 MARLEY ECO-TUFF FASCIA 3000mmX150mmX8mm

AFAET2230 MARLEY ECO-TUFF FASCIA 3000MMX225MMX8MM



Accessories required that are not available from Marley Roofing, though may be sourced from local suppliers and manufacturers of items listed below.

12. Aluminium Drip Flashing



13. Foam Tape



Minimum Installation Guideline - to be considered with Marley's Good Installation Practice!

To ensure the water tightness and adequate ventilation of a Marley Solar Roof, the roof construction needs to adhere to the following:

- Minimum pitch 26 degrees
- To ensure perfect interlock and colour aesthetics, Marley SolteQ Solar Tiles must be fitted with Marley Modern M22 Midnight Black.
- In hot climatic conditions, the roof must be fitted with Marley Supreme Single Sided Radiant Barrier, white side must be facing up, to prevent unnecessary radiation back onto cables and reflective foil downward into the loft cavity to promote better insulation. In areas with stronger wind conditions (coastal regions) Marley Double Sided Radiant Barrier may be used, as constant airflow will promote a cooler environment between the roof cover and radiant barrier cavity.

Important! Care must be taken to seal any perforations, cuts, holes to the radiant barrier. We would advise the use of a foam tape – placed between the underlay and counter batten to aid with sealing holes caused by fixing of Radiant Barrier. Roof to be inspected after installation to ensure radiant barrier is sound – [please take photos!](#)



- Marley Modern must have an overlap of 75mm, with 345mm batten centres – increased overlap may result in covering of solar cells.

*Please note that Marley Modern at 75mm headlap application together with Marley SolteQ Solar Tiles, was tested at Marley UK laboratories wind tunnel testing facilities and have passed the requirements, as set against standard for wind driven rain & deluging. Please contact Marley Specification Department for a copy of the test results.

- Double batten system:

Tiles need to be raised at least 75mm from the radiant barrier to promote adequate ventilation and to allow sufficient space for cable stringing during installation.

In order to achieve this, a double batten system is required - counter battens fixed vertically over the truss/rafter and radiant barrier, followed by tiling battens that are fixed horizontally across counter battens.

- Eaves and Ridge ventilation requirements:

Due to the required ventilation of eaves and to create a sufficient drip edge on overhangs, it is required that the radiant barrier is extended over sprocket ends and overlaps the tilting batten of the bottom course's eaves battens or fascia board, to protrude slightly by +20mm, into the gutter. See Figure 1

To prevent the underlay from sagging and forming a water trap behind the fascia board, it must be pulled taut and supported in such a manner that it slopes straight down into the gutter.

Overhangs - to protect the exposed underlay from wind damage on exposed overhangs, soffits should be closed.

- Openings at eaves (Figure 1 & Image 1), are covered with Marley Eaves Grid (Figure 1 & Image 2), by nailing clout nails or copper nails (coastal areas) through the perforations of the grid into the eaves battens. This is to prevent infestation of birds and large insects.

- After the Marley Eaves Grid has been fixed, an aluminium drip edge flashing (Figure 1 & Image 3 - manufactured by an aluminium roofing accessories supplier), is fixed between the top course's batten on edge and Marley Modern Flat Concrete Roof Tiles to prevent water ingress at eaves and to provide an aesthetically pleasing result.

Figure 1

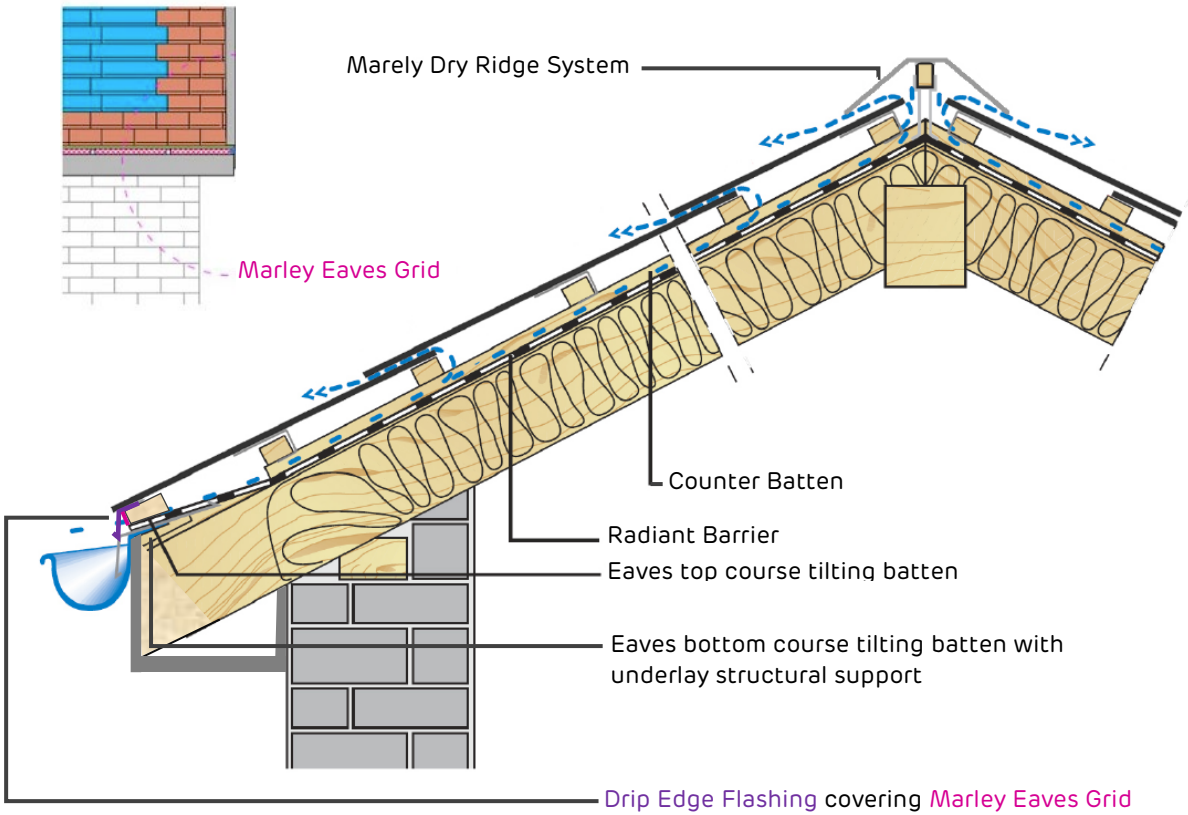


Image 1

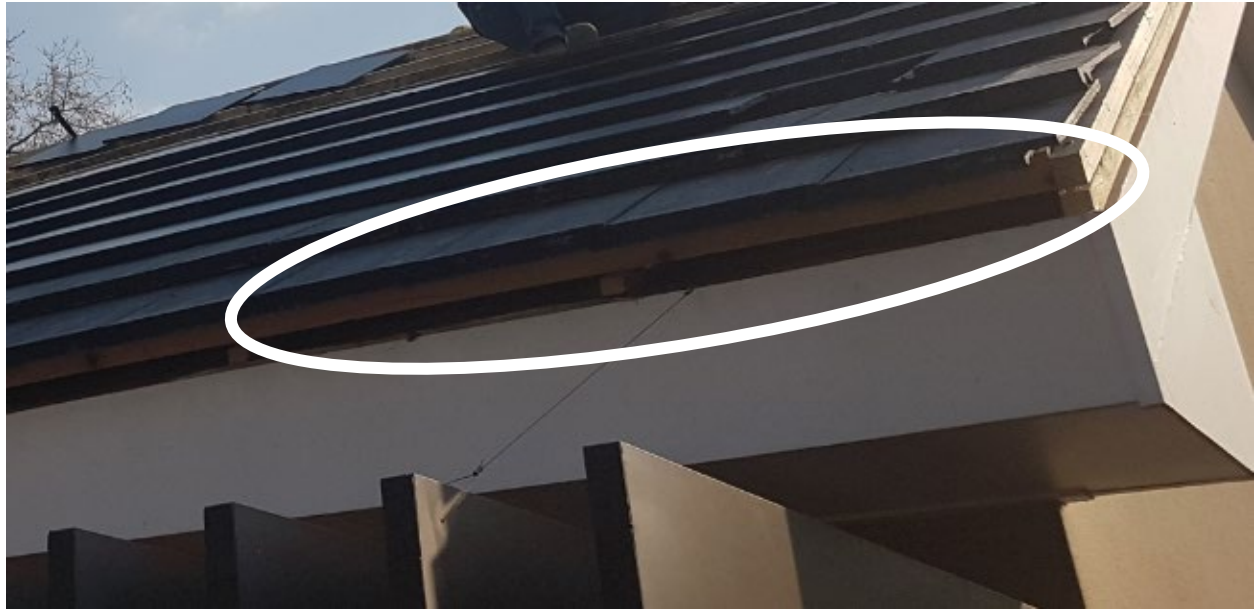


Image 2



Image 3



- Ridges are ventilated with Marley's Dry Ridge System – please refer to Marley Roofing's Dry Ridge Installation Guide available from our website:

https://marleyroofing.co.za/wp-content/uploads/2019/07/Marley_dry_ridge_installtion_guide_copy.pdf

Recommendations and Fixing Instructions

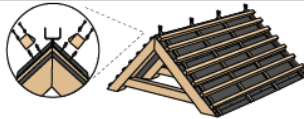
To secure or to fix use galvanised or stainless steel nails / staples.
Recommended temperature of fixing - above 5°C
Recommended temperature of storing - not exceeding 35°C
When using adhesive strips, the surface of the tile/slate should be clean, dry and free of dust and grease. The screws should be finished off with a screwdriver to make sure clamping plates are tightly secured.

Fixing instructions:

1. Lay the underlay and battens in the normal manner. If ventilation is required set back 5 - 30 mm from the ridge apex on both sides to provide an air ventilation gap. Do not fix the top tiling / slating batten at this stage.



2. Using nails fix the ridge batten bracket to the rafters or trusses through holes on each side. Fit the ridge batten and secure to the ridge batten bracket.



3. Fix top tiling / slating batten in the normal manner and leave a 10 mm air gap if required. Lay and fix the roof tiles or slates in accordance with the manufacturer's fixing specifications.



4. Roll out ventilated ridge roll along the ridge batten, secure using nails or staples at 1 metre intervals.



5. Make sure the surface of the tile or slate is clean, free of dust and dry where the corrugated edge of the ridge roll will be laid down. Peel off the protective tape from the adhesive strip on the underside of the roll and press down into the tile or slate surface. Carefully adjust the corrugated edges to the shape of the tiles / slates.



6. Ridge tile holder is applied for mounting ridge tiles to the ridge batten. It should be nailed through the pre-punched holes into ridge batten with screws. The bottom edge of the upper ridge tile fits into the hook portion of the clip. The hook portion can be easily bent onsite by pressing due to aluminum material.



We know how important it is to find practical information and to keep up with the latest development in Roofing. Visit our website or scan the QR code for more information on the latest in Roofing news, product and tips.



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EMAIL info@marley.co.za
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General installation principles and good roofing practice apply, please refer to Marley Minimum fixing specification and Good Roof Tiling Practice Guide.

As with any roof installation, Marley Roofing will not guarantee the workmanship of any roof installation.

Marley Roofing will only guarantee the performance of the Marley SolteQ Solar Tile if all conditions have been met as per its Marley SolteQ Solar PV Tile Guarantees Terms and Conditions Policy! For more information, please visit: <https://marleyroofing.co.za/wp-content/uploads/2019/09/Marley-SolteQ-Solar-PV-Tile-Guarantees-Terms-Conditions-SEP-2019.pdf>

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