

Free-Standing Carport

PLANS AND INSTRUCTIONS



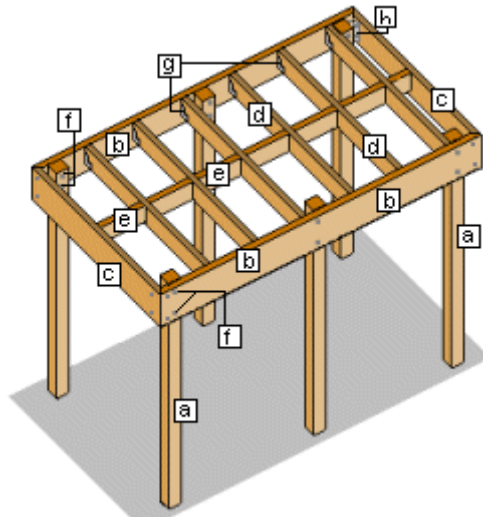
- This is the **Metric version**

Free-standing flat roof carport.

This single carport is 6000mm long by 3000mm wide. It is the most basic of carports. Because each site is different, and individual preferences vary, we have given options for both post installation and bracing. Check with your Local Authority to see if any permit or consent is required. A building consent for a carport is required in New Zealand.

Identifying the members

- (a) Posts 100x100
- (b) Beams 200x50
- (c) End rafters 200x50
- (d) Rafters / Purlins 150x50
- (e) Noggings 150x50
- (f) Galvanised bolts
- (g) Joist Hangers
- (h) Galvanised Angle Bracket



The timber

The timber for this project can be either sawn (rough sawn) or dressed (gauged, smooth finish). The measurements used in this project are for sawn timber. If dressed timber is preferred, make allowances for the difference in timber thickness and width.

Use a timber suitable for in-ground applications for the posts such as pressure treated pine H4 or H5 and use a timber suitable for exterior applications for the rest of the carport structure, such as pressure treated pine H3.

Any timber merchant or supplier will be able to advise on the timber most suitable.

The height

The height of a carport is in most cases, common sense. A tall person should be able to walk comfortably under the lowest end of the carport. 2100mm from the finished ground to the underside of the lowest end rafter, is a good height.

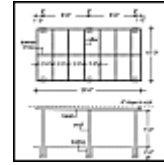
The slope

The roof slope (fall) should be at least 50mm. In this project the slope is 100mm. If using a clear PVC roof, then a steeper slope is advisable, as a steeper fall (say

150mm) means faster water run-off, and therefore a cleaner roof.

The plans

The plans (click on the thumbnail) show a flat plan "bird's-eye view" and an elevation (side) plan giving all dimensions. Refer to these plans for any required measurements throughout the project.



[click to enlarge](#)

Setting out

Mark out the carport (6000mmx3000mm rectangle) and erect timber profiles out from each corner and also out from the middle to take in the two center posts. Set the timber profiles back at least 600mm from the building line (carport perimeter) to allow room for hole digging etc. For instructions on making timber profiles [click here](#). Attach stringlines to indicate the centres of the six posts 100mm in from the side edges and 350mm from the front and back edges.

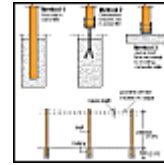
INSTALLING THE POSTS

Method 1. Post set in concrete.

Dig post holes 300mm square by 600mm deep. Place 100mm of concrete into the bottom of every hole.

Commence putting the posts in the holes against (but not touching) the stringline. Using a spirit-level on both the front and side faces, check that the post is plumb (vertical) and almost, but not quite, touching the stringline.

Fill the hole with concrete to within 50mm of the finished ground level. Check again that the post is plumb and not quite touching the stringline. Because of the depth of the hole, the concrete will support the post without the need for bracing. Continue until all posts are concreted in.



[click to enlarge](#)

Method 2. Galvanised post brackets set in concrete.

Dig post holes 300mm square by 600mm deep. Fill the holes with concrete and set the brackets in position while the concrete is still soft. Ensure the brackets are at the right height, taking the finished slab (carport floor) into consideration. Some temporary packing, props or bracing may be needed to support the brackets until the concrete stiffens up. Wait until the concrete has cured (usually at least four days) and then install the posts plumb (vertical) in the brackets and hold in place with temporary bracing.

Method 3. Galvanised post brackets bolted to existing concrete slab.

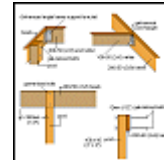
Fix the brackets to the slab, in position with masonry bolts or anchors. Install the posts plumb (vertical) in the brackets and hold in place with temporary bracing.

TRIMMING THE POSTS

Mark the rear posts a minimum of 2300mm above the slab, or finished ground level. Ensure the height marks on both rear posts are level. Use a spirit-level on a straight edge to achieve this or the [water level method](#). Mark the front two posts 100mm higher than the rear posts. Fix a stringline between the front and back posts to mark the height of the middle posts. Cut the tops of the posts off at these marks.

THE BEAMS AND RAFTERS

Cut the two beams 6000mm long with 45degree angle cuts each end and clamp in place to the posts so that the tops of the beams are flush with the tops of the posts and protrude past both the front and rear posts by 300mm. Drill and bolt the beams to the posts with M12 galvanised bolts, (two at each meeting).



[click to enlarge](#)

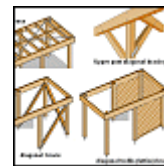
Cut the two end rafters 3000mm long with 45degree angle cuts each end and fix in place to the beams with 75mm jolthead galvanised nails and then with galvanised angle brackets, each bracket fixed with four M12 galvanised bolts, two through the beam and two through the rafter. (See diagram).

Cut the six intermediate rafters 2900mm long and fix in place to the beams with galvanised metal joist hangers. Space the rafters at 900mm centres (crs, o.c.). See [the plan](#).

Finish off with a longitudinal row of trimmers (noggings) down the middle and in between the rafters.

THE BRACING

If the posts are concreted into the ground, and the posts are bolted to the beams with two bolts at each meeting, then no further bracing should be required. If, however, the posts are not in-ground, but supported by galvanised post brackets, then additional bracing is required. One such scenario is to fix upper post diagonal bracing ([see diagram](#)), two to each post, each about 900mm long (more or less), and fixed to the post with nailplates and fixed to the beam/rafter with bolts.



[click to enlarge](#)

Another scenario is to fix full 100x100 diagonal braces running from the bottoms of the middle posts to the tops of the end posts and secure with bolts, nail plates or galvanised brackets at each end. A similar diagonal brace is also required between the two rear (end) posts. With this latter scenario, the diagonal braces could be replaced with diagonal trellis (lattice) between the two end posts and the end post and middle post each side (three panels in all). Both bracing methods mentioned in this scenario also require roof plane bracing to ensure the front of the carport is rigid. This can be 25mmx1mm flat galvanised metal strapping stretched from corner to corner and fixed with galvanised nails to the top of each rafter.

THE ROOF

You can now apply your chosen roof.

All done. Eazy with a "Z"!

Glossary of terms used in this project

BEAM: A supporting member.

BRACE: To make rigid

BUILDING LINE: The outline of a building.

CENTRES: Crs; O.C; *Term used for spacing;* The measurement of spacing for studs, rafters, and joists in a building from the center of one member to the center of the next.

CRS: See centres.

JOLTHEAD: General purpose nail. Small round head.

LONGITUDINAL: Running the length of the building.

M12: 12mm thick galvanised bolt.

MASONRY: Stone, brick, concrete, hollow-tile, concrete block, or other similar building units or materials.

PROFILES: *Timber profiles;*

Horizontal boards attached level to stakes, used to mark out the boundary of a construction and establish the levels.

PVC: Plastic type roof, spouting and downpipe.

RAFTER: Parallell members of a roof that support battens/purlins and roofing materials.

CURE: Mature; Harden; Set.

DIMENSIONS: Any of the three linear measurements, length, breadth, and depth.

DRESSED: *Relating to timber.* Planed; Smooth, even surface; gauged.

ELEVATION: Side view of a building.

END RAFTER: Rafter each end of the roof frame.

FALL: *Of roof.* Pitch; The incline angle of a roof surface.

FLUSH: being even with

GALVANISED: Covered with a protective coating of zinc.

GAUGED: See dressed

H3: *Of timber* Pressure treated suitable for exterior use but not in-ground.

H4: *Of timber* Pressure treated suitable for exterior use and in-ground applications.

H5: *Of timber* Pressure treated suitable for exterior use and in-ground structural applications.

JOIST HANGER: U shaped metal hanger attached to a bearer or beam, into which a joist or rafter is fitted.

MASONRY BOLT/ANCHOR:

Special screw or bolt for masonry that expands when tightened.

MEETING: Where two members meet.

MEMBER: Piece of timber that is part of a frame or structure.

NAIL PLATE: *Gang nail plate;*

Metal plate with rows of sharp points that are hammered into butt-jointed timber to secure the join.

NOGGING: *Trimmer;* A short piece of timber set between two studs, joists, rafters or purlins to keep them rigid.

O.C.: On centre; (See centres)

PERIMETER: boundary.

PLANE BRACE: A diagonal brace running along the plane of a roof.

PLANED: See dressed.

PLUMB: Vertical; Upright.

PURLIN: Timber used to support roofing sheets. Usually fixed on top of rafters, but in this case the purlins are the rafters.

RECTANGLE: Four sided figure with four right angles.

ROOF PLANE BRACE: See plane brace.

SAWN: *Rough sawn;* Not gauged, planed or dressed.

SLAB: *Of concrete;* pavement, i.e. driveways, garages, and basement floors.

SLOPE: See fall.

SPIRIT LEVEL: Tool used to ensure surfaces are level or plumb by means of a bubble in a tube of liquid fitted to the level.

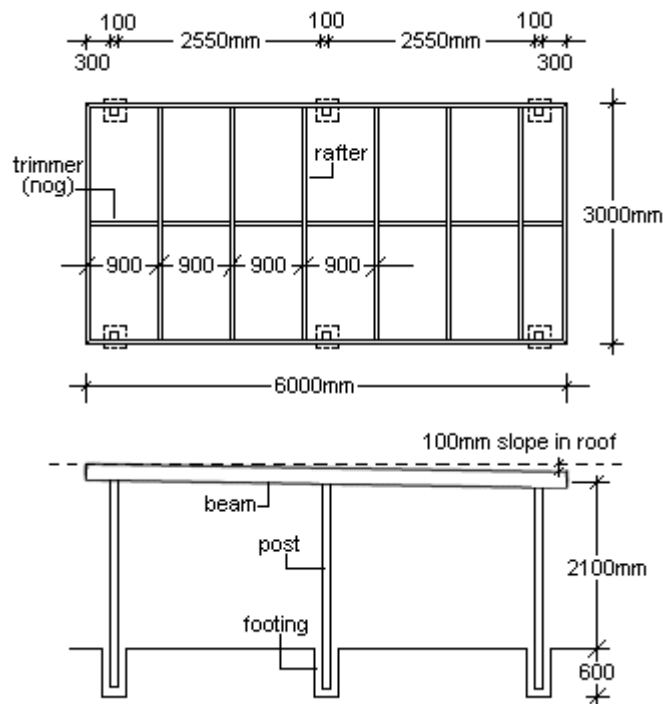
STRINGLINE: A slightly elastic string stretched between two pegs and used as a guideline. Determines the building line.

TIMBER PROFILE: See profiles.

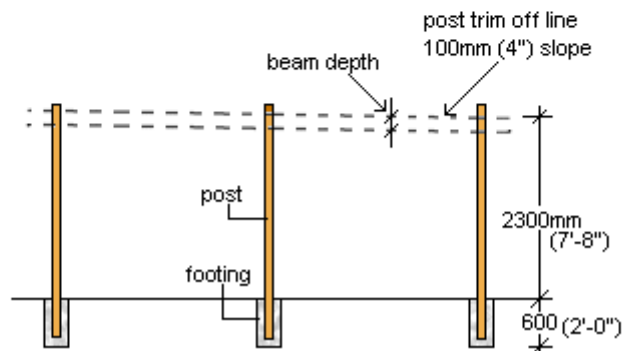
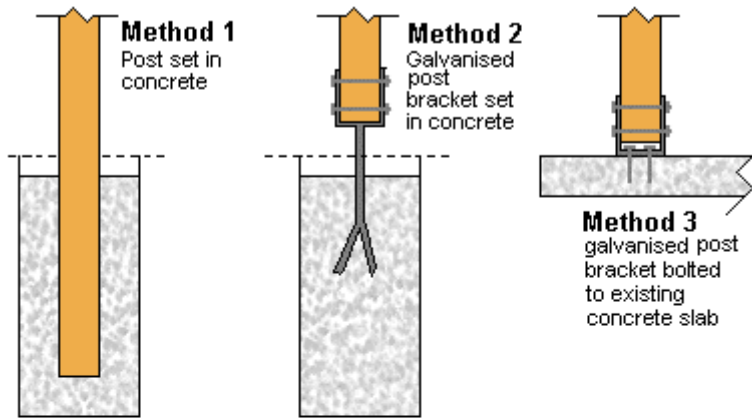
TRIMMER: See noggings

VERTICAL: See plumb.

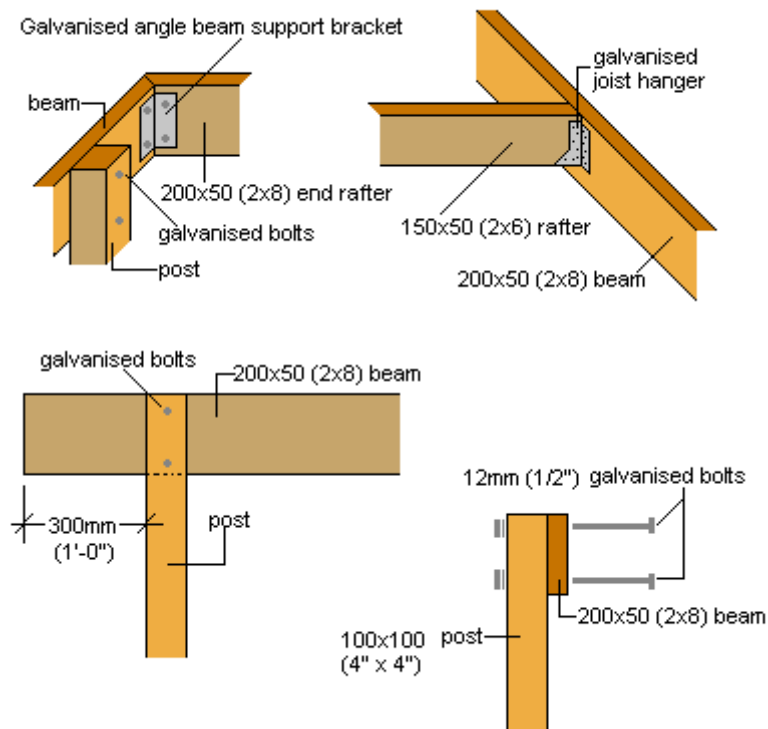
The Carport Plans and Dimensions



The Carport Posts

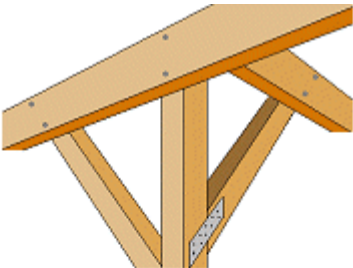
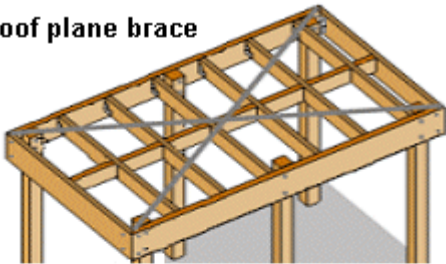


The Carport Beams and Rafters

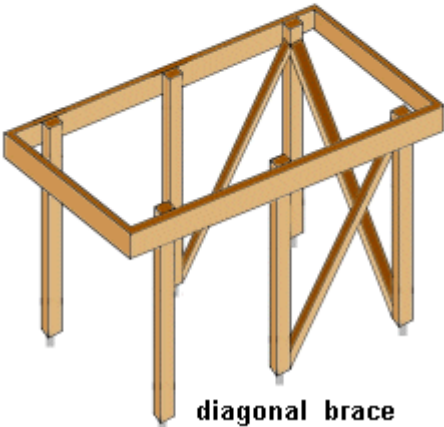


Carport Bracing

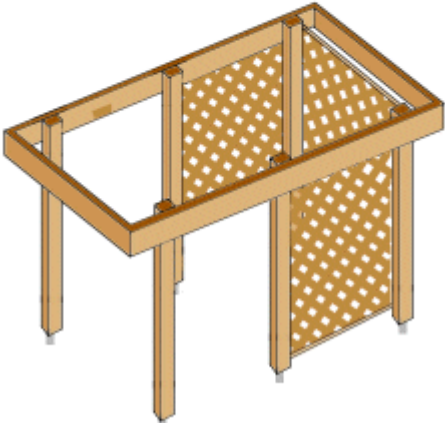
roof plane brace



upper post diagonal bracing



diagonal brace



diagonal trellis (lattice) brace