DIY Pergola Guide

Planning your Project
Easy Step by Step Guide
Simple Illustrations
Maintainence

The specifications contained within this brochure are for guideline purposes only. For further information contact a registered consulting engineer and or your local shire council.

By following a straightforward programme you can build an attractive and long-lasting pergola with the minimum of effort and using only a few basic woodworking tools.

Tanalised® timber is the ideal material for all garden structures. Strong yet light and easy to handle, it is pressure treated with either Tanalith® or Vacsol® wood preservative to give it lifetime durability.
Planning your Project

General Hints:
When you have planned your pergola it is advisable to consult your local council to ensure the structure conforms to local government regulations. Refer to local government regulations for requirements regarding pergola’s.

It is strongly recommended that a competent professional builder be engaged to construct pergola’s.

It is also important to make sure that the pergola does not interfere with existing drainage, plumbing or electricity services.

Where footings are in proximity to council sewer and or stormwater it may be necessary to complete a build over or near a sewer or stormwater application. Check with your local shire council, certifier or engineer for further details.

Hazard Class Selection Guide AS1604.

Timber Selection Guide:

<table>
<thead>
<tr>
<th>Hazard Class</th>
<th>Typical Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3 Outside, above ground</td>
<td>Decking, fencing, cladding, fascia, window joinery, exterior structural timber (above ground), engineered wood products</td>
</tr>
<tr>
<td>H4 Outside, in ground</td>
<td>Fencing, pergolas, landscaping timbers, posts, greenhouses, non structural retaining walls less than 1m high</td>
</tr>
<tr>
<td>H5 Outside, in ground or fresh water</td>
<td>Structural retaining walls, building poles, house stumps, cooling tower infill, pilings in fresh water or critical applications</td>
</tr>
<tr>
<td>H6 Marine waters</td>
<td>Boat hulls, marine piles, jetty cross-bracing, landing steps, sea walls</td>
</tr>
</tbody>
</table>

Before you Start:

• Pergolas can be free standing or attached to buildings. Two methods of fixing to buildings are shown in this guide.
• When lightweight roofing materials are used, check manufacturer recommendations as the addition of roofing materials may alter spans and sizes quoted in the guide.
• Mark out the location of the pergola accurately.
• Before building your shade house or pergola give careful thought to the area in which you site the structure.
• Avoid shading established plants and make sure of good post embedment. The stability of the structure depends entirely upon the firm embedment of the posts.
• Once you commence building the pergola remember the old adage – “Measure twice, cut once”.

If the pergola is to be attached to an existing structure, the existing structure should be checked and verified by a registered engineer to ensure that it is structurally adequate to sustain the added load of the pergola.

Notes:
This guide assumes an M-site classification as per the Australian standard for residential slabs and footings AS2870-2011 with a minimum bearing capacity of 100kPa.

You should consult a registered geotechnical and or civil/structural engineer to confirm the site classification and bearing capacity of the site prior to you commencing any works.

If the site classification differs from an M-site (i.e moderately reactive) and or the bearing capacity is less than a 100 kPa it will be necessary to engage a registered civil/structural engineer to design the footings.

This guide assumes a wind classification of N2 which is a common classification for dense residential areas.

You should engage a registered civil/structural engineer to confirm the wind classification for your individual site.

Tools checklist:
- Tape measure, Square, Pencil
- Hammer and Chisel
- Spirit level, plumb bob
- String line, String level
- Crowbar and Shovel
- Circular saw or Hand saw
- Power drill with bits
- 12mm masonry bit
- Spanner for 12mm bolts/ nuts
- Endseal preservative
- Galvanised fasteners
Easy Step by Step Guide

Pergola Construction:

Beams:
• This table shows the maximum distances different beam sizes will span (B). Note: The choice in beam size also depends on rafter span (A).

<table>
<thead>
<tr>
<th>Rafter Cross Section (mm)</th>
<th>Maximum Rafter Span (mm)</th>
<th>Maximum Overhang (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 50</td>
<td>1800</td>
<td>600</td>
</tr>
<tr>
<td>150 x 50</td>
<td>3600</td>
<td>600</td>
</tr>
<tr>
<td>200 x 50</td>
<td>4800</td>
<td>600</td>
</tr>
</tbody>
</table>

EXAMPLE: If a beam span (B) of 2.5m and a rafter length (A) of 4.5m is planned for, then a beam with cross section of 150x50mm is needed.

Rafters:
• This table allows the span and overhang which can be allowed for different rafters (A) spaced at 600mm centres.

EXAMPLE: For a Rafter cross section of 150 x 50mm and the beam spacing is set to 1.8m, then max rafter span should be 3.6m plus a double overhang of 600mm for a total rafter length of 4.8m.

Pergolas for Decks:
• Pergolas can be added to Tanalised® treated pine decks. Posts are extended through the deck to carry beams and the construction is exactly as shown on this page.

Setting Posts:
First establish post spacing and embedment depth. Then mark out and dig the holes for the uprights.

Hole Diameters:
Up to 250mm posts - dig 450mm diameter holes.

Dig post holes to a depth of 900mm.

Set posts as shown using concrete. The posts should be stood and temporarily braced before setting. Check the height, alignment using string lines and a level.

CONCRETE EMBEDMENT
Use minimum 25mPa concrete for concrete footings.

Carry concrete above ground level and angle to shed water runoff.

Dig Post holes at least 200mm greater in width than the post.

Dig 100mm over deep and layer with 100mm of coarse hard fill for drainage.

For existing concrete slab footing.

To man. specs
EXISTING CONCRETE FOOTING.
Setting out the pergola:

- Mark out and peg the positions of the posts. Check diagonally for square (diagonal measurements should be equal).
- Set posts using concrete pad. Refer Setting Posts detail.
- When posts are in position mark the height for fitting the beams. Use a taut line and string level. Securely fix beam to posts by selected fixing technique, e.g. flush joint or housing joint. Drill and bolt beams to posts with M12 galvanized Grade 4.6|S bolts of suitable length, refer sketch 2.

- Install bracing to stabilize frame. Method of stabilizing structure will depend on location of pergola, fast fixing method and aesthetic detail selected. Should bolt systems not be adequate, angle braces can be installed between posts and beam, refer sketch 3.

- Fixing to buildings. Where a pergola is to be fixed to an existing structure. Various methods may be used (dependent on height required for pergola). You should engage a registered structural engineer to review the existing structure to ensure it is structurally adequate to support the added load of the pergola and to determine the appropriateness of the method of fixing to the existing structure.

- Rafter connection to beam may be by butt, triplegrip or by housing joint. Refer sketch 6. Feature detail of rafter ends is to your personal preference. Due to natural flexibility of timber, rafters may be stabilized by using 50 x 25mm or larger battens at right angles to the rafters and set at approximately 900mm centres. They can be nailed on top of the rafters and also checked into the top edge. Refer sketch 7. the battens may be closely spaced to achieve water run off falls suitable for light weight sheeting materials.

- A) To walls – ledger bearers may be fixied by masonry anchors to brickwork or coachscrews to timber. Discuss correct system and size of fasteners and centres with supplier, refer sketch 4. Please consult with a registered structural engineer to determine the structural adequacy of the existing wall prior to fixing to it.

- B) To Fascia – (replaces beam)
  1) With the use of selected galvanized triple grips, rafters may be fixed directly to a fascia, refer sketch 5.

  11) reinforce fascia stability by extra nailing to the ends of the existing rafters in roof structure.
  111) Depending on depth of area available beneath the gutter section, rafters may be checked if required to allow for guttering installation.
  1V) Note that this method of fascia fixing is only suitable for use with light weight short span rafters. For larger spans and roofed sheet structures, advice should be sought from a registered structural engineer.
Shade Houses:

• Choose Shade house style 1, 2 or 3 below.
• Mark out and Set Posts as per Setting Posts detail.
• Place the bearer on the ground and hold against the base of the two uprights to which it is to be attached. Equalise the overhang and make sure any bow in the timber is facing upwards. Then mark off the two hole positions on the bearer in line with the post centres. Drill two vertically aligned holes right through the bearer. Place the bearer in position with two 12mm galvanized coach bolts or deck spikes entered in the holes. Fix by driving bolts or spikes into the end of the upright.

• Bearers for closed roof structures should provide for a 5 fall to provide a watershed. Where closed roof structures are likely to be exposed to high wind loadings it is recommended that bearers be fixed to the side of the upright with a through bolt.

• When attaching rafters, carefully mark hole positions and pre-drill rafter only. Place the rafter in position on the bearer and drive spike into the bearer.

• Where an anchor base is used it will be necessary to brace the structure with corner angles.

Suggested Covering Materials:

• Cover your garden shelter to suit your own particular needs. A few suggestions, use lattice for climbing plants and shade, brush materials for privacy and ferns or shade cloth for plant protection. Standard widths of shade cloth are 1.8 and 3.6 metres.

Note: Basic modules can be constructed and joined using intermediate rafters (dotted lines) to give big area coverage at low cost.
Wash work clothing regularly and separately.

Don’t use treated sawdust or shavings for animal litter.

Always wash your hands before eating, smoking or going to the toilet.

Always wear dust mask and goggles when handling treated timber.

Do not use treated timber for cooking fuel.

Always wear gloves when handling treated timber.

Do not burn treated timber.

Always Dispose of treated waste in an approved landfill.

Always Dispose of treated waste in an approved landfill.

Treated timber should not come in contact with drinking water.

Always wash your hands before eating, smoking or going to the toilet.

Safety Instructions:

Always refer to product safety data sheets for full health and safety instructions

Wash work clothing regularly and separately.

Always wear dust mask and goggles when handling treated timber.

Don’t use treated sawdust or shavings for animal litter.

Always wash your hands before eating, smoking or going to the toilet.

Disclaimer:

These specifications are for guideline purposes only. As conditions vary from one site to another it is strongly recommended that you consult with a registered consulting engineer and your local shire council. These plans have been checked and approved (at the time of printing) by Civil & Structural consulting engineers Roy B Hoskins & Associates of QLD 4060, to be technically accurate and generally designed in accordance with the appropriate Australian Standards. As the Australian standards, local, state and national laws are subject to change, please check with your local authorities prior to starting construction.

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shed and retaining wall